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EFFECTS OF INNOVATIVE ENTREPRENEURSHIP AND THE INFORMATION SOCIETY ON SOCIAL PROGRESS: AN INTERNATIONAL ANALYSIS

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Abstract. The effects of entrepreneurship and information and communication technology (ICT) on countries' development have been extensively studied, mainly from the perspective of their contributions to economic growth. However, from the human development paradigm, economic income is only resource helping people satisfy their economic needs. This study provides new evidence to bridge the gap in our understanding of how entrepreneurship and ICT improve the quality of people's lives. To achieve this goal, we use the capabilities approach as a theoretical framework. The empirical analysis was conducted using ordinary least squares with a sample of countries to provide evidence that innovative entrepreneurship, as measured by the Global Entrepreneurship Monitor, has a positive relationship with human development, as measured by the Social Progress Index. The results show that ICT, as measured by the Networked Readiness Index, is positively related to social progress, indicating that ICT is a tool that helps people improve their ability to lead the life they desire. Finally, we find that ICT boosts the positive effect of innovative entrepreneurship on social progress, and thus, that enhancing ICT, and with it, entrepreneurial innovation activity, improves the quality of life.

Keywords: social progress; information society; information and communication technologies; innovative entrepreneurship; theory of human development

1. Introduction

Academics in the field of social sciences have historically been motivated to study entrepreneurship (Landström et al. 2012; Urbano et al. 2019). Research on the effects of entrepreneurship has focused primarily on establishing the impacts on economic growth, productivity, and employment (Acs, Szerb 2007; Carree et al. 2007; Chen et al. 2018; Perényi, Losoncz 2018). Interest in understanding the effects of entrepreneurship on the economy grew at the beginning of the 1980s when the US study of job creation by Birch (1981) concluded that small and medium-sized enterprises (SMEs) were the main agents creating employment (Audretsch 2007; Gnyawali, Fogel 1994; Urbano, Alvarez 2014).

From the perspectives of economic growth, economic development, and regional development, the effects of entrepreneurship depend primarily on factors such as a country's stage of development, the economic sector in which the entrepreneurial activity is performed, and the motivations that lead people to become entrepreneurs (Acs et al. 2012; Acs, Storey 2004; Audretsch et al. 2008; Coulibaly et al. 2018; Núñez-Cacho et al. 2018; Urbano, Aparicio 2016). Two main motivations have been identified: the exploitation of an opportunity to provide the goods and services required by society and the need to be self-employed as a subsistence mechanism (Bosma et al. 2017). The type of entrepreneurship generating the greatest impact on economic growth and development is opportunity entrepreneurship oriented toward innovation (Acs, Storey 2004; Audretsch 2012; Baumol 1993; Bosma et al. 2017; Cuéllar-Gálvez et al. 2018; Demartini 2018; Reynolds 2017; Schumpeter 1939; Shane, Venkataraman 2000; Urbano et al. 2016; Wennekers et al. 2005).

Kleine (2010) indicated that since the second half of the 20th century, discussions about countries' development have been guided by different perspectives. These include theories aligning development and economic growth (Lewis 1954; Myrdal 1957; Rostow 1960), theories arguing that the origin of dependency and inequalities are characteristic of a capitalist system (Frank 1967), and alternative approaches to development that recognize ecological, economic, and social goals (Chambers 1983). One of the most influential theories that counteracts the view of development focused on economic growth is the capabilities approach (CA) proposed by Sen (Kleine 2010; Robeyns 2005). This approach defines development as "a process of expanding the freedoms that people enjoy" (Sen 1999, p. 3) to lead the kind of life they have reason to value (Drèze and Sen 2002). In this theory, economic growth and technology are important means for people to achieve and live the life that they value (Drèze, Sen 2002; Robeyns 2005).

Most studies that explain the effects of entrepreneurship on countries' development have focused on determining their contribution to economic growth. Gross domestic product (GDP), an indicator of economic growth, is used to determine how rates of entrepreneurship affect this indicator. The literature review by Gries and Naudé (2011) showed that few studies have been published on the impact of entrepreneurship on development beyond its contribution to economic growth, highlighting the need for more research that provides evidence to bridge this gap.

Accordingly, the first goal of this study is to present new evidence on the relationship between entrepreneurship and human development (HD), which motivated the following question: How does entrepreneurship influence social progress? To answer this question, the CA is used as the theoretical framework, which implies that to determine the effects of entrepreneurship on HD, a first analysis should identify if entrepreneurs are engaging in this activity because it is what they really want to do and be or because it is imposed by their socioeconomic circumstances. A second analysis must focus on the normative aspect of entrepreneurship to identify whether this type of activity positively or negatively affects HD. Therefore, it is necessary to evaluate the relationship between entrepreneurship rates and multidimensional measures of HD.

Since the first decade of the 21st century, the entrepreneurship rates in around 100 countries has been measured by the Global Entrepreneurship Monitor (GEM), which ranks as the most important entrepreneurship monitor globally (Reynolds 2017; Reynolds et al. 2005). GEM data are the main source of information for conducting empirical studies that attempt to explain the causes and effects of entrepreneurship (Urbano, Alvarez 2014). Therefore, in this study, we used the data on innovative entrepreneurship published by the GEM. When measuring HD, the main limitation is the scarcity of multidimensional indexes that can capture the extent to which people satisfy their needs (Stiglitz et al. 2009). Another limitation is associated with the absence of time series data on multidimensional indexes to measure quality of life (Porter et al. 2017).

Following the publication of Sen's approach, the United Nations Development Programme (UNDP) adopted the concept of HD in 1990, which is now measured globally using the Human Development Index (HDI) (UNDP 2016). The use of this index has drawn criticism since the measure is only based on three dimensions: a long and healthy life, access to knowledge, and a decent standard of living (UNDP 1990, 2015a). Based on this, the Social Progress Imperative—guided by the studies by Sen et al. (UNDP 2015a) among others—created a new quality of life index in 2013. Termed the Social Progress Index (SPI), this index is calculated from 53 indicators classified into three dimensions of social progress: basic human needs, foundations of well-being, and opportunity. The SPI is thus considered to be an internally consistent approach to measuring HD (Porter et al. 2017; Stanojević, Benčina 2019). Therefore, in this study, we use the SPI as the measure of HD.

The second goal of this study is to understand the effect of information and communication technology (ICT) on countries' development. Sen (2010) argued that ICT is responsible for the creation of an interactive global culture. The positive use of ICT, such as using it to expand human freedoms, enables both greater efficiency in various human activities and a stronger ability to fight government repression of individual freedoms. Kleine (2010) argued, however, that the discourse on ICT for developing continues focuses too heavily on economic growth, with severe limitations for capturing the impact of these resources on people's quality of life. Similarly, Heeks (2010) indicated the need for more evidence on the impact of ICT on development, especially studies based on theories supporting HD. Likewise, Thapa and Saebø (2014) argued for quantitative research to understand the effects of the relationship between ICT and development and Oosterlaken (2012) recommended performing empirical studies to analyze ICT at the micro and macro levels for politicians, professionals, and activists responsible for development. Johnston et al. (2015) also found that insufficient studies have elucidated ICT's contribution to solving social problems.

In this study, the Networked Readiness Index (NRI) serves as the measure of ICT usage and adoption. The NRI, created by the World Economic Forum, the Business School for the World, and Cornell University, seeks to measure countries' readiness to exploit the benefits of emerging ICT and potential to exploit the opportunities presented by the digital revolution (World Economic Forum 2016b). According to James (2012), the NRI is the most popular and frequently used measurement for comparing and measuring ICT usage in a country.

The first contribution of this study in the analysis of the relationship between entrepreneurship and social progress is to identify the type of entrepreneurship that improves quality of life. The usage of the SPI as a measure of HD allows us to provide new evidence about the incidence of innovative entrepreneurship in improving quality of life from a multidimensional perspective, beyond its contribution to economic growth. The second contribution is demonstrating the impact of ICT on HD, using the NRI as the primary measure. We also explore the interaction of entrepreneurship and ICT usage on HD.

The remainder of the paper is organized as follows. We first present the conceptual framework and formulate the hypotheses in Section 2. Section 3 discusses the methodology used and information sources. Section 4 provides the results and Section 5 presents the conclusions, recommendations, and political implications.

2. Conceptual framework and hypotheses development

2.1 The capabilities approach (CA)

Since the 1950s, GDP per capita has been used to measure development (Kuznets 1955). Research has recognized, however, that pure economic indicators do not represent the full multidimensionality of development (Jones, Klenow 2010; Naudé et al. 2009; Stiglitz et al. 2009). The theory of social choice developed by Sen during the 1970s states that there are regulatory reasons for modifying welfare economics and the exclusive dependence on income and wealth as indicators of HD. Based on this, Anand and Sen (2000) argued that focusing on variables such as GDP per capita and national wealth to measure levels of development perpetuates the traditional approach oriented to opulence, whereas the search for well-being should focus on the improvement in positive freedoms or people's capabilities (Sen 1999).

Atkinson (2002) and Bourguignon and Chakravarty (2003) found broad consensus that multiple factors cause a deprivation of goods and services. Therefore, addressing poverty through people's income level is insufficient. In this sense, other attributes associated with the expansion of capabilities should be analyzed. The CA provides the tools to analyze inequality based on its multidimensionality. For Sen (1999), HD is associated with people's capability to live the kind of life that they have reason to value.

The philosophical thinking of the CA has provided the basis for creating a paradigm that seeks to redirect the discussion about the concept of wealth to what people are able to do or be. The CA differs from the utilitarian approach, which explains people's level of satisfaction based on the amount of goods and services that enable them to have a particular lifestyle (Fukuda-Parr 2003; Robeyns 2017). The CA bases its analysis on the concepts of capabilities, functioning, achieved functioning, and agency (Drèze, Sen 1991; Matthews, Field 2001; Sen 1981 1995, 1998, 1999, 2005, 2009; Sugden, Sen 2006). Capabilities are what people are free to do, functioning is what people actually do (Anand et al. 2009), achieved functioning is the result of the actions that a person enjoys at a certain point in time, and agency refers to the ability of a person to pursue goals they have voluntarily set. A person without agency is one who performs crucial activities in their life as an obligation (Alkire 2005).

Robeyns (2017) developed a revised version of the CA that validates the concepts of capabilities, functioning, and agency and stresses the importance of including other fundamental elements that enable people to do and be what they desire. These elements include resources (income from labor, wealth, transfers, profits, and non-market production), the structural limitations associated with institutional conditions (social and legal norms, social institutions, and other people's behavior and characteristics), and the conversion factors related to the different skills that people must have to transform resources into functioning. Appendix A presents a schematic view of the core concepts in the CA, formulated by Robeyns (2017).

According to the above, social conversion factors and structural limitations play predominant roles in expanding capabilities or freedoms. In the new institutional economic theory outlined by North (1990, 2005), these elements constitute institutional conversion factors. For Drèze and Sen (2002), expanding people's freedoms or capabilities depends mostly on interaction processes with other people and the role of the state, reflected through its institutions. These authors thus recommended paying special attention to the opportunities influenced by structural constraints.

2.2 Innovative entrepreneurship and the CA

According to Alkire (2008), the CA has two practical uses: evaluation (i.e., enabling a comparison of situations) and its proposal, which establishes policy recommendations that can expand capabilities. Sen's practical contribution to the HD paradigm has been of such significance globally that the United Nations (UN) has used the

CA since 1990 as the theoretical framework for the universal promulgation of the concept of HD (UNDP 1990). This concept includes the expansion of people's capabilities so that political, economic, and social freedoms provide them with "opportunities for being creative and productive" (UNDP 1990, p. 10). This definition highlights the need for people to develop their creativity, which motivates them to innovate for the production of goods and services, potentially approaching the concept of entrepreneur suggested by Schumpeter (1939). Similarly, the UN's vision of the impact of entrepreneurship on HD is seen in the reports it has issued (Table 1). The review shows a close relationship between entrepreneurship and HD, with the 2015 report in particular highlighting the benefits of creative entrepreneurship and innovation, which may positively impact society (UNDP 2015b).

Table 1. Relationship between entrepreneurship and HD

Year(s)	Name of report and subject analyzed	Link between entrepreneurship and HD
1990	Human Development Report: Definition of Development.	Increasing opportunities and capabilities for productivity and creativity (UNDP 1990).
1993	Human Development Report: Measures to Ensure People-Friendly Markets.	Promotes free enterprise as a mechanism for "unleashing human creativity and entrepreneurial ability."
		Entrepreneurship produces benefits not only for the individual but for society as a whole, such as job creation.
		Boost business capacity, making it easier for entrepreneurs to obtain financial capital (UNDP 1993).
2002	Human Development Report: Deepening Democracy in a Fragmented World: Broadening the Scope of Human Development.	Entrepreneurial spirit can make markets more dynamic (UNDP 2002).
2007–2008	Human Development Report: Fighting Climate Change: Human Solidarity in a Divided World: The Traps of Low Human Development. "Before-the-Event" Losses in Productivity.	Poor people are not poor because they are less enterprising. They are less enterprising because of their aversion to risk and the impossibility of bearing the financial costs associated with the risks of setting up a new business (UNDP 2007).
2015	Human Development Report: Work for Human Development: Policies for Improving Human Development Through Work.	Establish government policies to support young businesspeople.
		Requirements to ensure that creativity and innovation can flourish and innovate inclusively, increase democratic creativity and innovation for the public good.
		"Job creation and enterprise development provide an income and a livelihood for the population, are essential instruments for fairness, form spaces for participation and enhance self-esteem and dignity" (UNDP 2015a).

Source: The authors, based on Human Development Reports 1990–2016

However, few studies published in high-impact journals provide information on the relationship between entrepreneurship and HD. One important contribution was by Gries and Naudé (2011), who proposed a theoretical framework that could relate entrepreneurship to HD based on the CA approach. For these authors, entrepreneurship is a functioning because it is the result of the economic or work activity in which people are involved. They argued that entrepreneurship, as a resource, has the capacity to generate new job opportunities in addition to facilitating other functionings. The link between entrepreneurship and agency is associated with allowing a prospective entrepreneur to detect an opportunity and materialize it freely and spontaneously. The act of starting a business can be considered, in terms of Robeyns (2017), to be a context-dependent functioning since social conversion factors and structural constraints significantly influence its achievement.

Notably, the CA, before analyzing functionings from a normative perspective, suggests its neutrality be recognized, which refers to the action (functioning) of generating results that can be valued positively or negatively. Therefore, if an action is evaluated negatively, it is not excluded as a functioning (Robeyns 2017). Accordingly, the analysis of entrepreneurship as a functioning implies recognizing its neutrality; in other words, being an entrepreneur does not depend on the impact of the business on society, but on the action of creating a new business itself. Once the entrepreneurial action has taken place, the person who carries it out and society establish value judgments about its expediency.

Likewise, the CA constitutes a theory of well-being and therefore any account of the capability or explanation developed within the framework of this approach must tend toward well-being (Robeyns 2017). This position is supported by Sen (1985, 1993). Thus, when introducing the normative part of entrepreneurship, from the CA perspective, this human activity must be viewed as a refined functioning; in other words, one that is chosen over several possibilities (Sen 1987). Entrepreneurship must be innovative and productive in the sense of Baumol (1990). Gries and Naudé (2011) defined it as "the resources, processes, and state of being through and in which individuals utilize positive opportunities in the market by creating and growing new business firms" (p. 217). This definition is normative in the CA framework because it values or validates only entrepreneurial activities that have a positive impact on quality of life. Gries and Naudé (2011) argued that their definition tries to go beyond the concepts formulated by Schumpeter (1939) and Kirzner (1973) to recognize that the benefits obtained by an entrepreneur not only provide monetary gain, but also are oriented toward achieving the kind of life desires and generating a surplus for society as a whole.

The GEM classifies entrepreneurs into different types according to their motivations for becoming entrepreneurs (opportunity vs. need) and type of economic activity (Reynolds et al. 2005). Based on the recognition of the conceptual neutrality of the functionings, necessity entrepreneurship is a functioning. However, its assessment from the normative perspective cannot be extended beyond the definition, that is, as a means of subsistence for the person who performs it (Reynolds et al. 2005). The results of some studies of the impact of being an entrepreneur by necessity indicate that when a person is obliged to perform an activity as the sole option for subsistence, it restricts his or her agency, which can cause dissatisfaction because he or she is unable to exercise his or her free will and do what he or she really desires (Binder, Coad 2016; Block et al. 2015). Similarly, according to Harbi and Grolleau (2012), necessity entrepreneurship has a questionable impact on the happiness of people. According to Gries and Naudé (2011), it restricts human agency because it is solely a means of subsistence for the person who performs it.

As mentioned in the Introduction, however, opportunity entrepreneurship, especially innovative entrepreneurship, contributes to economic growth and job creation (Acs, Storey 2004; Audretsch 2012; Baumol 1993; Bosma et al. 2017; Cuéllar-Gálvez et al. 2018; Demartini 2018; Reynolds 2017; Schumpeter 1939; Shane, Venkataraman 2000; Urbano et al. 2016; Wennekers et al. 2005). This type of entrepreneurship possesses the characteristics closest to the concept of entrepreneur adopted in this study, because such entrepreneurs have (i) the necessary economic and non-economic resources to be transformed into innovative products or services; (ii) the necessary

skills and knowledge to manage their business activities; (iii) the necessary freedom to transform the resources and bring them to the market as final goods or finished products. At this point, entrepreneurs can use their liberties to create a new firm because it is allowed under the structural restrictions; and (iv) the recognition of this action as a functioning. Further, they have (v) agency because creating a new enterprise is a voluntary act that allows entrepreneurs to fulfill their goal of achieving the life they desire. The result of this action generates a positive social impact, as it creates new employment options and new goods or services to cater for the needs of others.

Therefore, entrepreneurship activities based on an opportunity and oriented toward innovation may contribute significantly to social progress, giving rise to our first hypothesis:

Hypothesis 1 (H1). Innovative entrepreneurship is positively related to social progress.

2.3 ICT and the CA

Understanding development as the expansion of capabilities does not mean denying the importance of the resources (Robeyns 2017) proceeding from economic growth or technological progress as tools that encourage HD. The effectiveness of income and technology should therefore be evaluated according to their impact on capabilities expansion (Drèze, Sen 2002). Sen (2010) recognized ICT as "an interactive culture across the world" that transcends the debate on local vs. global knowledge. ICT is equally absorbed by both people who defend modernity and globalization and people who defend local culture. Sen also argued that the questions we should ask about ICT usage should focus on how ICT can help people be more efficient in their work and how ICT usage can be important for expanding capabilities to win battles for freedom and against the continuity of repressive governments.

Several authors have analyzed the impact of ICT on HD using the CA. Interest is growing in demonstrating the role of ICT in HD using the CA approach, since ICT can contribute directly and simultaneously to the expansion of human capabilities in different areas (e.g., health, education, recreation, and as a means of subsistence). Oosterlaken (2012) showed that ICT "might thus be seen as the ultimate embodiment of the ideal of the capability approach, that we ought to promote a variety of capabilities and leave it up to empowered individuals which functioning to realize, depending on their idea about a good life" (pp. 12–13). Similarly, Kleine (2010) stated that ICT is a useful tool for improving people's capability to make effective decisions that enable them to achieve their desired results. Given the potential to expand opportunities and facilitate the process of choice, the CA is especially interesting for those who study and work in the field of ICT and development.

The literature review by Lwoga and Sangeda (2019) on the impact of ICT on quality of life enhancement in developing countries highlighted the CA as one of the main reference frameworks used since the 1990s to explain this relationship. The prevalence of the CA stems from its broader view, including the social dimensions of development where ICT usage can improve living conditions. Despite multiple evaluations, the review showed that the contribution of ICT to HD remains debatable, however. In an extensive review of the link between ICT and development analyzed using the CA approach, Thapa and Saebø (2014) found that ICT may contribute to expanding capabilities, particularly to what Sen (1999) called instrumental freedom, which is related to guarantees of transparency.

From the perspective of international organizations oriented toward development, the UN uses a number of its Human Development Reports to recommend that national governments create or strengthen the institutional framework that encourages the use and adoption of ICT as tools to expand capabilities. Table 2 shows how ICT contributes to HD.

Table 2. Relationship between ICT and HD

Year	Name of report	Link between ICT and HD
1992	Human Development Report	The significance of ICT, as a means that narrows the gap between the richest and poorest, is in the international agenda on development because the adoption and use of ICT promotes sustainable HD (UNDP 1992).
1998	Human Development Report	Broadening access to schooling and ICT has expanded people's potential, thereby facilitating their development within society (UNDP 1998).
1999	Human Development Report	The use of new ICT is driving globalization; that is, the fusion of computing and communications through the Internet has broken the barriers of cost, time, and distance. Therefore, this fusion has raised efficiency in various human interaction activities (UNDP 1999).
2001	Human Development Report: Making New Technologies Work for Human Development	The democratization of all technological advances has been through giving people access to them. ICT is a tool used to improve quality of education and facilitate the entry of SMEs into markets (UNDP 2001).
2003	Human Development Report: Millennium Development Goals: A Compact Among Nations to End Human Poverty	ICT plays a major role in meeting the Millennium Development Goals, especially Goal No. 8: Develop a global partnership for development, for which target No. 18 was established in cooperation with the private sector, making the benefits of new technologies available, especially ICT. As of 2003, statistics on ICT use around the world have been included in the Human Development Reports (UNDP 2003).
2013	Human Development Report: The Rise of the South: Human Progress in a Diverse World	ICT is recognized as a means to expand human capabilities (UNDP 2013). It is important for people's control of public bodies, which are required to publish on their websites all information associated with their functioning (UNDP 2014, 2015a, 2016).
2014	Human Development Report: Sustaining Human Progress: Reducing Vulnerabilities and Building Resilience	
2015	Human Development Report: Work for Human Development	
2016	Human Development Report: Human Development for Everyone	

Source: The authors, based on Human Development Reports 1990–2016.

Similarly, the UN has promoted the Information Society. At its 2002 summit (General Assembly of the United Nations 2002), representatives of 174 countries approved the creation of the Information Society, considering the Universal Declaration of Human Rights, especially the fundamental right of every individual to freedom of

opinion and expression. The Information Society was born as a comprehensive and development-oriented institution whose main goal is to improve people's quality of life by promoting ICT adoption and use (International Telecommunication Union & United Nations 2005). The UN Human Rights Council also recognizes "the global and open nature of the Internet as a driving force in accelerating progress towards development in its various forms" (General Assembly of the United Nations 2012), and access to this medium is seen as an extension of the fundamental right to freedom of expression. Based on International Telecommunication Union (2008) statistics, 48.6% of the global population had access to and used the Internet in 2017. The General Assembly of the United Nations (2015) approved a general examination of the Information Society's global reach. The UN recognizes the importance of ICT in achieving the 17 Sustainable Development Goals by 2030. The evaluation also highlights the digital economy as an important and growing part of the world economy (General Assembly of the United Nations 2015).

Another international organization that advocates the importance of ICT in development is the World Economic Forum, whose 2016 Global Information Technology Report (World Economic Forum 2016b) argued that ICT constitutes the backbone of developments occurring in the fourth industrial revolution. This revolution has fostered an exponential increase in capabilities for processing and storing information as well as for making this knowledge accessible to people as never before, facilitating better HD in the future.

Since 2001, the Global Information Technology Report series published by the World Economic Forum, INSEAD, and Cornell University has measured the drivers of the ICT revolution at the global level using the NRI. The NRI has evolved over time and now evaluates the state of network preparation using 53 individual indicators. For each of the 139 economies studied, the NRI identifies areas of priority for the use of ICT for better socioeconomic development (World Economic Forum 2016b). It also delivers information on the individual, family, business, and public adoption and use of the Internet, cell phones, personal computers, telephone network infrastructure, and Internet servers with secure access as well as the use of virtual networks (World Economic Forum 2016b). As mentioned in the Introduction, the NRI is the most frequently used measurement to identify countries' use and adoption of ICT.

Based on the above, we propose the following hypothesis on the virtues of ICT as an instrument that improves quality of life:

Hypothesis 2 (H2). ICT adoption and use are positively related to social progress.

2.4. ICT, entrepreneurship, and the CA

Hamel (2010) suggested that the effectiveness of ICT in improving quality of life can be increased to the extent that its use and adoption is accompanied by strategies or programs that favor human activities. Similarly, Kleine (2010) stated that ICT is a useful tool for improving people's capability to make effective decisions that enable them to achieve their desired results. According to the above, the analysis of the effects of using ICT on entrepreneurial activities should begin by determining how to improve the living conditions of entrepreneurs when they decide to use such technology. A study conducted in Indonesia reported that the use of cell phones by blind microentrepreneurs had a fundamental role in the perceived well-being of the people analyzed (Anwar, Johanson 2015). This study also concluded that cell phones facilitated functionings that the participants valued greatly. The same conclusion was reached by the authors on cell phone use for a sample of religious women and microentrepreneurs in Indonesia (Anwar, Johanson 2014). Kemal (2019) argued that the use of ICT allows microentrepreneurs to obtain sustainable livelihoods, such as increased income and profits, access to new markets and market information, less dependence on physical/natural resources, and risk reduction.

From the perspective of improving society's quality of life, as a result of the actions undertaken by entrepreneurs on the basis of ICT use, several studies have found that an SME's usage of ICT reduces multidimensional poverty by creating new jobs and facilitating enterprise subsistence (Duncombe 2003; Makoza, Chigona 2012; Mbuyisa, Leonard 2017). Similarly, the US government has recognized that ICT usage in nascent enterprises is important for improving social progress, so it created the Digital Freedom Initiative to help entrepreneurs and small businesses make better use of ICT to create jobs and improve the standard of living of locals (Ferrer 2009). Given the growing significance of the digital economy, the 28 member countries of the European Union (EU) approved the creation of a digital single market in 2015 to create digital opportunities for people and companies using the Internet and digital technologies. According to studies performed by the EU, the creation of the digital single market would reduce regulatory barriers, enabling a transition from 28 national markets into a single market, which, when fully functional, could contribute €415 billion to the EU economy and create hundreds of thousands of new jobs (European Commission 2015). Mathew (2010) argued that ICT allows women entrepreneurs to increase their participation in the growth and development of the nation's economy: "The extended use of ICT will help the entrepreneur in creating advantage, research; participate in the global world of business for technology transfer, training, collaboration, and development initiatives at the global level" (p. 1). ICT is thus a driving force in the creation and dissemination of new products and services (Alderete 2017).

Within the CA framework, to determine the importance of public or private intervention in the enhancement of quality of life, the relationship between resources and functionings needs to be studied (Robeyns 2017). In this sense, innovative entrepreneurship is a functioning and ICT is a resource. Therefore, the effectiveness of ICT and innovative entrepreneurship on social progress can be measured more accurately by relating them. Sen (1999) suggested that the quality of people's lives depends on what they are capable of doing or being with the resources to which they have access. Regarding the use of ICT, as mentioned in Section 2.3, Sen (2010) argued that the question we should ask is how these resources can help people be more efficient in their work and how their usage can expand capabilities.

According to the above, the relationship between ICT and innovative entrepreneurship must be analyzed from the perspective of ICT's influence on the efficiency of entrepreneurial activity to improve quality of life. In this sense, the analysis of the relationship between ICT and innovative entrepreneurship and their effects on social progress uses their interaction; that is, ICT does not cause entrepreneurship, but these resources increase the effects of entrepreneurship on social progress. Therefore, ICT is a resource that moderates the impact of innovative entrepreneurship on social progress. Baron and Kenny (1986) argued that "moderators and predictors are at the same level in regard to their role as causal variables antecedent or exogenous to certain criterion effects. That is, moderator variables always function as independent variables, whereas mediating events shift roles from effects to causes, depending on the focus of the analysis" (p. 1173).

The analysis of innovative entrepreneurship in Section 2.2. indicates that it has a positive impact on social progress because it creates new goods and services as well as jobs, contributing to economic growth, and is a functioning that improves quality of life. Similarly, as discussed in Section 2.3, ICT adoption/use is positively related to social progress. Taking into account that both effects are positive, we infer that when innovative entrepreneurs use ICT, there is an increase in the effect of their activity on social progress. In this sense, the following hypothesis is suggested:

Hypothesis 3 (H3). The effect of innovative entrepreneurship on social progress is higher when it is moderated by ICT.

Figure 1 summarizes the hypotheses of the present study. Initially, we propose that innovative entrepreneurship has a positive effect on social progress (H1). Then, we suggest that the use and adoption of ICT has a positive effect on social progress (H2) and, finally, the effects of innovation entrepreneurship on social progress increase

when they are moderated by ICT (H3). For this last hypothesis, a dotted line is used to indicate that ICT moderates the effects of innovation on social progress.
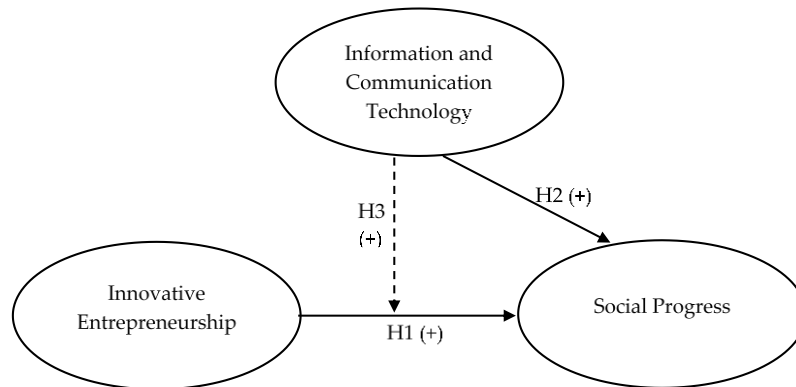
Fig.1. Effect of innovative entrepreneurship on social progress, of ICT on social progress, and of innovative entrepreneurship on social progress moderated by ICT
Source: the authors

3. Materials and methods

3.1 Materials

3.1.1 Dependent variable

Since 1990, the indicator most frequently used to measure HD has been the HDI (UNDP 1990, 2015a). Since the CA aims to expand the freedoms that people enjoy to lead the kind of life they have reason to value (Sen 1999), the HDI has been criticized for not including additional indicators related to the range of functioning that contributes to quality of life (Alkire, Foster 2011; Anand et al. 2009; Hirai 2017; Klugman et al. 2011; Naudé 2013). In 2013, the non-profit Social Progress Imperative, under the leadership of Michael Porter at Harvard University and Scott Stern at the Massachusetts Institute of Technology, published the first version of the SPI as a tool to measure quality of life as an alternative to the HDI. In 2015, after discussions with experts globally on the shortcomings of using GDP per capita as an indicator of development (Porter, Stern 2013; Stern et al. 2017), this foundation launched a new version of the SPI. Based on the theoretical concepts of development formulated by Sen and colleagues (see Porter, Stern 2013), the SPI was defined as "the capacity of a society to meet the basic human needs of its citizens, establish the building blocks that allow citizens and communities to enhance and sustain the quality of their lives, and create the conditions for all individuals to reach their full potential" (Stern et al. 2017, p. 3).

The SPI is structured into three elements: dimensions, components, and indicators. The dimensions are the three sub-indexes (basic human needs, foundations of well-being, and opportunity). Each dimension is composed of four components and each component is composed of indicators aggregated to each component through exploratory factor analysis using principal component analysis. Appendix B presents the structure of this index. To measure the reliability and consistency of the SPI scales, the creators calculated the Cronbach's alpha for the indicators of each component. After performing the principal component analysis for each component, they

assessed goodness of fit using the Kaiser–Meyer–Olkin measure of sampling adequacy. Stern et al. (2014) provided a detailed analysis of the rigorous process for creating and validating the SPI. As an additional measure of the reliability of the SPI scales, we calculated the Cronbach's alpha (Cronbach 1951), but this time for the results published for each sub-index. The result of 0.891 indicates that the variable grouping is valid because it is greater than 0.7 (Bland, Altman 1997).

Since the SPI constitutes a non-economic index to measure quality of life enhancement from multiple dimensions, in this study, the SPI was used as a dependent variable. To test this indicator's consistency as a measure of HD, we performed a correlation test between this index and the HDI using databases on the SPI and HDI for four annual periods (2014–2017), with information from 145 countries. The result obtained from the bivariate auto-correlation Pearson's test (1920) was 0.959, with a confidence level of 99%. Figure 1 shows the linearity of this relationship, which indicates that the SPI is a consistent measure of social progress as well as a suitable proxy of HD (Asandului, Iacobuta 2016; Efthymiou et al. 2016; Lo et al. 2017; Mattedi et al. 2015; Mayer et al. 2017).
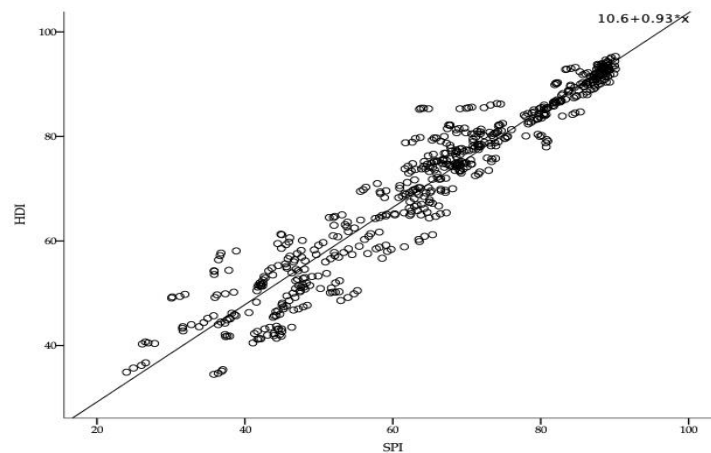
Fig.2. Relationship between the HDI and SPI

The SPI has been used in other studies that have attempted to explain the causes and effects of some of the processes of human interaction in improving quality of life (Asandului, Iacobuta 2016; Lo et al. 2017; Mattedi et al. 2015; Mayer et al. 2017). The analysis by Stanojević and Benčina (2019) identified the SPI as one of the most robust composite indexes for measuring quality of life because of the large number of indicators that measure how people are satisfying their needs while avoiding the use of GDP. The calculation of the SPI is supported by a complex theoretical foundation. The measure's major limitation is the short period it covers.

3.1.2 Independent variables

We divided the independent variables into two groups. The first measures innovative entrepreneurship and the second measures the institutional framework that encourages ICT usage in different countries. The variables in each group are detailed below.

3.1.2.1. Entrepreneurship variable

The entrepreneurship variable analyzed was the total entrepreneurial activity rate of innovation (TEAIN), measured as a percentage of all surveyed people involved in the total entrepreneurial activity rate. This type of entrepreneur is reported to provide new products or services for many of his or her customers and has few or no competitors. The TEAIN was obtained from the adult population survey published by the GEM administered in approximately 100 countries through stratified sampling by sex and age, considering the active population (people aged 18 to 64). The GEM usually provides 95% confidence intervals for the estimates in its global reports (Bosma et al. 2017). Researchers have used the TEAIN to determine the relevance of innovation entrepreneurship to economic growth and development (Szabo, Herman 2013), the relationship between entrepreneurship and the business cycle (Koellinger, Thurik 2012), the influence of social progress on innovative entrepreneurship (Aparicio et al. 2016), and the relationship between leadership styles and innovative entrepreneurship (Van Hemmen et al. 2015).

3.1.2.2. ICT usage variable

The NRI measures a country's capacity to capitalize on ICT to increase competitiveness and welfare. It is structured into three categories including four sub-indexes (environment, readiness, usage, and impact); 10 pillars, distributed across the sub-indexes; and 53 indicators, distributed across the pillars. The Environment sub-index is composed of laws and public policies affecting ICT implementation, innovation, and the development of entrepreneurial activities. The Readiness sub-index measures a society's willingness to use ICT. The Usage sub-index measures the use of ICT in all sectors of society. Finally, the Impact (economic and social) sub-index is associated with ICT use (Baller et al. 2016). Appendix C presents the full structure of this index.

Detailed information on the method used to calculate the NRI is found in the Global Information Technology Report 2016 (World Economic Forum 2016b, p. xi): "The computation of the overall NRI score is based on successive aggregations of scores: individual indicators are aggregated to obtain pillar scores, which are then combined to obtain sub-index scores. Sub-index scores are in turn combined to produce a country's overall NRI score." As each aggregation step in the NRI applies equal weight, each sub-index has a weight of 25%.

To evaluate the weighting scheme for the NRI, Maricic et al. (2019) applied the enhanced Scatter Search (eSS) metaheuristics technique to obtain a weighting scheme that would increase the stability of the composite indicator. The objective function is based on the relative contributions of the indicators, whereas the problem constraints rely on the bootstrap Composite I-Distance Indicator (CIDI) approach. The eSS-CIDI approach combines the exploration capability of eSS and data-driven constraints devised from the bootstrap CIDI. The results obtained by Maricic et al. (2019) initially suggested that the equal weightings for each sub-index of the NRI could change when the eSS-CIDI was applied. The proposed model does not, however, guarantee a more stable solution than the official estimation method, and thus it should not be changed. Maricic et al. (2019) suggested that the results of the proposed method can be interpreted as a means to verify the official weighting schema.

As an additional measure of the reliability of the NRI scales, we calculated the Cronbach's alpha for the published results for each of its 10 pillars. The result obtained was 0.946, indicating that the grouping of the variables is valid since it is greater than 0.7 (Bland, Altman 1997).

Given the importance of the NRI as a measurement for use and adoption of ICT in 151 countries, several researchers have used this index to demonstrate the relationship of ICT with different aspects of human life (Binsfeld et al. 2017; Gong et al. 2018; Huang et al. 2018; Indjikian, Siegel 2005; James 2012; Kottemann,

Boyer-Wright 2009; Larios-Hernández, Reyes-Mercado 2018; Ntemi, Mbamba 2016; Otioma et al. 2019; Samoilenko, Osei-Bryson 2018, 2019).

3.1.3. Control variables

Although the main goal of this study was to identify the relationships between the TEAIN and social progress and between ICT usage and social progress, other factors also enhance quality of life. We thus considered personal income to be a means to facilitate the functioning and broadening of capabilities (Drèze, Sen 2002). The variable used to measure income was GDP per capita, adjusted to purchasing power parity at international dollar prices; several researchers have used this variable to measure monetary income (Anand, Ravallion, 1993). The population of the countries included in the study was taken as another control variable, specifically those aged 15–64 years. Data on both GDP per capita and total population were obtained from the World Bank for 2016 (World Bank 2013).

3.2 Method

The availability of information to perform the empirical analysis determined the estimation method (Wooldridge 2009). One of the main limitations of this study is the absence of time series—sets that enable estimations reflecting the behavior of the variables over time. The sample in this study was constructed from four secondary information sources. The information on the SPI was obtained from the Social Progress Imperative, which, since 2014, has published the advances made in the social progress of 130 countries on average (Socialprogressindex.org 2018). The NRI was obtained from the World Economic Forum, which has published information from 2012 to 2016 on the performance of 151 countries in the use and adoption of ICT (World Economic Forum 2016a). The TEAIN was obtained from the GEM, which has been publishing information on the evolution of this type of entrepreneurship globally since 2011. The GEM samples vary each year (GEM 2018). Finally, the GDP data and total population aged 15–64 years were obtained from the World Bank, which has historical data of these indicators from 1960 to 2018 for approximately 217 countries (World Bank 2018).

Taking into account that the information comes from multiple sources, the sample size and period of study differ in each organization that generates the data. Therefore, to use the most recent information, the study period was selected according to the most recent year in which there was published information for all the variables. In this case, 2016 was the last period in which the NRI published. Similarly, the sample size was obtained by selecting those countries for which there is information on all the variables under study. For 2016, the organizations that process and publish the data coincided in the collection of information on 56 countries in different continents, as seen in the countries highlighted in blue in Map 1. Appendix D lists the countries analyzed. This sample provides evidence to reduce the gap in the relationship between ICT and HD because most studies to date have focused on countries in Africa and South America (Lwoga, Sangeda 2019; Thapa, Saebø 2014).

Research area

■ Selected countries
□ Others countries

Escala: 1:1220

Selected Countries

1. Argentina	11. Cyprus	21. Greece	31. South Korea	41. Poland	51. Thailand
2. Australia	12. Ecuador	22. Guatemala	32. Kazakhstan	42. Panama	52. Turkey
3. Austria	13. Egypt	23. Croatia	33. Lebanon	43. Portugal	53. United Kingdom
4. Brazil	14. Ireland	24. Hungry	34. Slovakia	44. Russia	54. United States
5. Bulgaria	15. Estonia	25. India	35. Libya	45. Saudi Arabia	55. Uruguay
6. Canada	16. Salvador	26. Iran	36. Macedonia	46. South Africa	56. Indonesia
7. China	17. Finland	27. Israel	37. Morocco	47. Slovenia	
8. Chile	18. France	28. Italy	38. Malaysia	48. Spain	
9. Cameroon	19. Georgia	29. Jamaica	39. The Netherlands	49. Sweden	
10. Colombia	20. Germany	30. Jordan	40. Peru	50. Switzerland	

Map 1. Sample of the countries selected in this study

On the basis of the information available, the best technique for verifying the hypotheses proposed was ordinary least squares (OLS) in a cross-sectional regression. According to Urbano et al. (2019), OLS is the most commonly applied method for explaining the relationship between entrepreneurship, on the one hand, and institutions, development, and economic growth, on the other. The following models were created to test the hypotheses:

$$SPI = \beta_0 + \beta_1 TEAIN + \beta_2 GDPpp + \beta_3 POP + \varepsilon \qquad (1)$$

$$SPI = \beta_0 + \beta_1 NRI + \beta_2 GDPpp + \beta_3 POP + \varepsilon \qquad (2)$$

$$SPI = \beta_0 + \beta_1 TEAIN + \beta_2 NRI + \beta_3 GDPpp + \beta_4 POP + \varepsilon \qquad (3)$$

$$SPI = \beta_0 + \beta_1 TEAIN + \beta_2 NRI + \beta_3 NRI*TEAIN + \beta_4 GDPpp + \beta_5 POP + \varepsilon \qquad (4)$$

where the dependent variable is the SPI, the TEAIN represents innovative entrepreneurship, the NRI measures ICT usage and adoption in all sectors of society, GDPpp represents GDP per capita based on purchasing power parity, and POP represents the total population aged 15–64. The factors ranging from "β" _"0" to 〖" β" 〗_"5" are the estimated coefficients of each variable and "ε" represents unobserved scalar random variables. In all the models, GDPpp and POP were converted into natural logarithms to facilitate the interpretation of the results. The percentage change in the independent variable thus causes a percentage change in the dependent variable, expressed in the respective coefficient (Wooldridge 2009). In Model (4), NRI×TEAIN represents the interaction between innovative entrepreneurship and ICT as the moderating variable.

Models (1) and (2) verify H1 and H2, respectively. Models (3) and (4) were built to verify H3; this is especially the case for Model (4), represented in Figure 3, which is an adaptation of Baron and Kenny's (1986) model. This figure has three causal paths oriented toward the outcome variable (SPI): the effect of innovative entrepreneurship as a predictor (Path a), the effect of ICT usage as a moderator (Path b), and the interaction or product of the two (Path c). according to Baron and Kenny (1986), "The moderator hypothesis is supported if the interaction (Path c) is significant" (p. 1174).
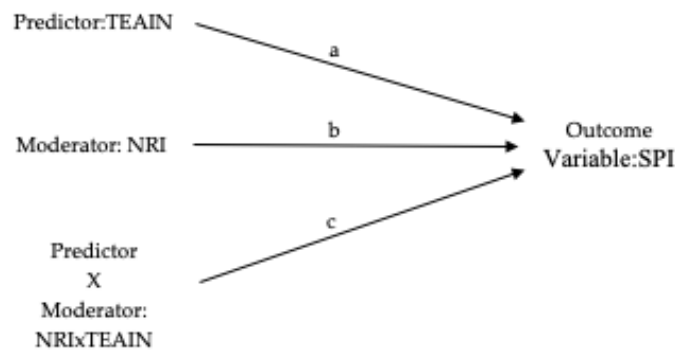
Fig.3. ICT as a moderator of the effect of innovative entrepreneurship on social progress. Based on Baron and Kenny's (1986) moderator model

The moderator can create multicollinearity problems since it would normally be correlated with the independent variables of which it is composed. Therefore, to control for the multicollinearity in Model (4), we used the deviation score approach following Cohen et al. (2014) by centering the data; we transformed the data into deviation scores, with means equal to zero.

4. Results

Table 3 summarizes the descriptive statistics of the variables used. The maximum and minimum values show no bias in sample selection due to the heterogeneity of the countries studied based on their levels of entrepreneurship, ICT adoption, and social progress. As Table 3 shows, the results of the bivariate correlations are consistent with the three hypotheses. These results provide initial evidence to test these three hypotheses. We found a positive and significant correlation between social progress and the TEAIN and a positive and significant correlation between social progress and ICT usage (NRI).

Table 3. Descriptive statistics and correlation matrix

No.	Variable	Mean	SD	Min.	Max.	1	2	3	4	5
1	SPI	76.049	9.979	48.55	90.55	1				
2	TEAIN	26.064	10.594	3.5	58.7	0.426 ***	1			
3	NRI	65.485	10.389	42.602	85.089	0.8498 ***	0.383 ***	1		
4	lnGDPppp	9.958	0.661	8.117	11.047	0.8533 ***	0.369 ***	0.8672 ***	1	
5	lnPOP (15–64)	16.422	1.597	13.616	20.718	−0.286 **	−0.115	−0.109	−0.107	1

Note: *** $p < 0.01$; ** $p < 0.05$. lnGDPppp represents GDPppp converted into natural logarithms and lnPOP represents POP converted into natural logarithms.

Table 4 summarizes the results of the three regression analyses conducted using OLS. The robustness tests for the models were performed following the assumptions of Gauss Markov as a mechanism to validate this analysis technique (Wooldridge 2009). In all the models, multicollinearity and heteroscedasticity were rejected; similarly, their correct specification was verified. This set of estimations indicates that the independent variables significantly explain social progress. The results for each estimation are discussed below.

Table 4. Regression analysis

Variable	SPI			
	Model (1)	Model (2)	Model (3)	Model (4)
TEAIN	0.134 **		0.1073 *	0.146 **
	0.660		0.060	0.065
NRI		0.4142***	0.385 ***	0.317 ***
		0.115	0.114	0.126
NRI×TEAIN				0.134 *
				0.075
GDPppp	11.788 ***	6.942 ***	6.698 ***	0.487 ***
	1.047	1.819	1.789	0.118
POP (15–64)	−1.111**	−1.189 ***	−1.094 ***	−0.181 ***
	0.409	0.377	0.374	0.058

Note: *** $p < 0.01$; ** $p < 0.05$, and * $p < 0.1$.

Model (1) indicates that innovative entrepreneurship has a positive and significant relationship with social progress, which supports H1. Following the conceptualization of Gries and Naudé (2011), innovative entrepreneurship is an effective functioning because it satisfies economic needs as well as needs of self-fulfillment. From Sen's (2005) perspective, this type of entrepreneurship enables people to do what they desire and then become who they want to be.

Model (2) shows that the variable measuring a country's capacity to use ICT to increase competitiveness and welfare has a positive and significant relationship with social progress, which supports H2. Similarly, this result is consistent with the proposed theoretical approach, which adds evidence to prior studies that have attempted to explain ICT use as a tool that facilitates functioning and that may enable people to achieve their goals (Andersson, Hatakka 2013; European Commission 2015; International Telecommunication Union & United

Nations 2005; Jurado-González, Gómez-Barroso 2016; Kleine 2013; Oosterlaken 2012, 2014; Poveda, Roberts 2018; Rifkin 2014; Sen 2010; Thapa, Saebø 2014; Walsham 2017; World Economic Forum 2016b; Zheng et al. 2018).

The results obtained about the positive relationship between the NRI and SPI are supported by studies demonstrating that ICT facilitates people's lives, regardless of their socioeconomic status, as well as their access to basic goods and services, thus expanding capabilities and opportunities (Rifkin 2014). According to Sen (2010), ICT fundamentally helps establish human interactions in all social spheres, regardless of the economic paradigm or philosophical thinking followed. ICT is used by the most rudimentary to the most developed economies to facilitate exchanges of goods and services. The Information Society, especially open Internet access, is enabling the expansion of the collaborative economy, aiding a paradigm shift in the exchange of goods and services and in turn improving the quality of people's lives and the implementation of sustainable development theories. Collaborative economy platforms and open access to codes and data found on the Internet encourage highly innovative scientific development (Ferrer 2009)

In Model (3), both the independent variables (TEAIN and NRI) were added, increasing the explained variance of the SPI. However, the results of Model (4) are more suitable for testing H3 because it indicates that the interaction between innovative entrepreneurship and ICT has a positive and significant effect on social progress. This interaction increases the explained variance of the SPI with respect to the other models. H3 is thus validated (Baron, Kenny 1986). As a robustness test of the results of Model (4), we apply the highest order unconditional interaction (Hayes 2015; Hayes, Matthes 2009), finding that the increase in the explained variance of the SPI, originated by the product of NRI×TEAIN, is significant at 91.9% confidence levels.

The estimation of Model (4) also tests the robustness of the proposed empirical analysis. All the variables included in this model are significant and have a positive (with the exception of the total population) relationship with social progress. The negative coefficient of the population variable with social progress can be associated with two factors: the unequal distribution of resources globally and scarcity of resources influencing quality of life.

The four estimations show that GDP per capita has a positive and significant relationship with social progress. These results are consistent with the CA on the importance of monetary income as a resource for broadening capabilities. According to Sen and Drèze (2002), understanding development within the CA does not mean denying the significance of economic growth or technological progress as tools that encourage HD. The effectiveness of economic growth and ICT should be evaluated according to the extent to which they broaden capabilities.

The results of Model (4) concur with the approach proposed by the World Economic Forum (2016b): properly channeled ICT can generate economic and social gains and increased ICT usage by firms can constitute a key element for development. This finding suggests that governments should encourage firms to adopt and use these technologies.

The Internet enables access to technical and specialized knowledge. The best universities in the world have a range of open courses through platforms such as Coursera and edX, which allow people to access knowledge. The development of innovations with a technological component has been promoted by open access to specialized research and open source software (World Economic Forum 2015). Similarly, virtual platforms of a collaborative economy foster activities from satisfying needs for food and leisure to obtaining financial capital to boost entrepreneurial activities (European Commission 2016; World Economic Forum 2015).

The use of the Internet as a platform for business enables the entrepreneur to overcome financing barriers through crowdfunding (Park 2012). Crowdfunding platforms worldwide raised USD $16.2 billion in 2014, an increase of 167% over 2013. Of the total collected in 2014, 41.3% (equivalent to USD $6.7 billion) corresponded to investments in business and entrepreneurship (Crowdfund Insider 2019). The most visible impact of Internet usage on entrepreneurship activities is associated with creating new market segments emerging through online start-ups, targeting 45.9% of Internet users worldwide. Start-ups have lower operational costs because the network helps distribute their products or services. The largest of these companies are ranked among the most profitable in the world: Google, Facebook, Amazon, and eBay (Baller et al. 2016; World Economic Forum 2015).

5. Conclusions

Research on the effects of entrepreneurship and ICT has focused on establishing the impacts on economic growth, productivity, and employment. However, this study presents new evidence of the link between innovation entrepreneurship and ICT and their influence on HD using the CA as a theoretical frame of reference. The CA helps us understand how a human activity or resource can enhance quality of life.

First, our analysis of innovative entrepreneurship, which is equivalent to a functioning as it represents a human activity, enables people to be what they wish—the innovative entrepreneur performs this activity spontaneously, employing his or her personal conversion factors, resources, and capabilities. This action is valued positively because it contributes to satisfying a person's individual needs and encourages the expansion of his or her capabilities. Taking the SPI as a measure of HD, we confirm that innovation entrepreneurship positively influences HD, at least in the dimensions measured by the SPI: satisfaction of basic needs, foundations of well-being, and opportunity.

Second, ICT is a crucial resource that may expand capabilities and functioning for people to lead the life they desire. On this, we provide new evidence of the influence of ICT on HD, as increases in ICT usage and adoption, measured by the NRI, raise HD, measured by the SPI.

Finally, we provide new evidence that ICT moderates the effects of innovative entrepreneurship on social progress. In this sense, according to the estimation results of Model (4), we conclude that ICT boosts the positive effect of innovative entrepreneurship on social progress. This affirmation confirms the UN's conclusion that the positive impact of ICT on HD is greater if it is related directly to a specific human activity.

The main limitation facing this study is the scarcity of secondary information that would allow us to adopt causality statistical techniques such as Granger as well as estimations with other techniques related to time series such as panel data. Our results are thus only an approximation of the influence of entrepreneurship and ICT on HD.

From a practical standpoint, this study's results could be useful in the design of policies supporting opportunity entrepreneurship, especially for innovation, because necessity entrepreneurship restricts human agency and its impact on people's quality of life is questionable. Therefore, it is necessary to reduce subsistence self-employment rates by expanding remunerated job offers. To promote innovative entrepreneurship, public programs could support nascent entrepreneurs to adopt and use ICT because this helps reduce both production and distribution costs. Further, ICT encourages market expansion online, generating opportunities for both entrepreneurs and customers to improve their quality of life.

In addition, strengthening and creating public programs that encourage an institutional framework (political, normative, and economic) for the adoption and use of ICT, especially the Internet, is recommended because these

tools make it easier for people to improve their quality of life. In many countries, programs exist to support the adoption and use of ICT. However, there is a growing trend, in both developed and developing countries, to establish barriers to Internet access, which could threaten the fundamental right to freedom of expression and weaken the Information Society, which favors the expansion of capabilities so that people can lead the life they really want. It is therefore essential that public policies in each country and international agreements continue to defend free and secure access to the Internet as the main means of global communication and information provision.

Finally, concerning the methodological limitations, future research should continue to provide information on the impact of entrepreneurship and ICT on HD. To this end, multidimensional synthetic indexes about HD could be created with information on cities or regions to determine its relationship with the creation of new firms in specific territories.

Appendix A
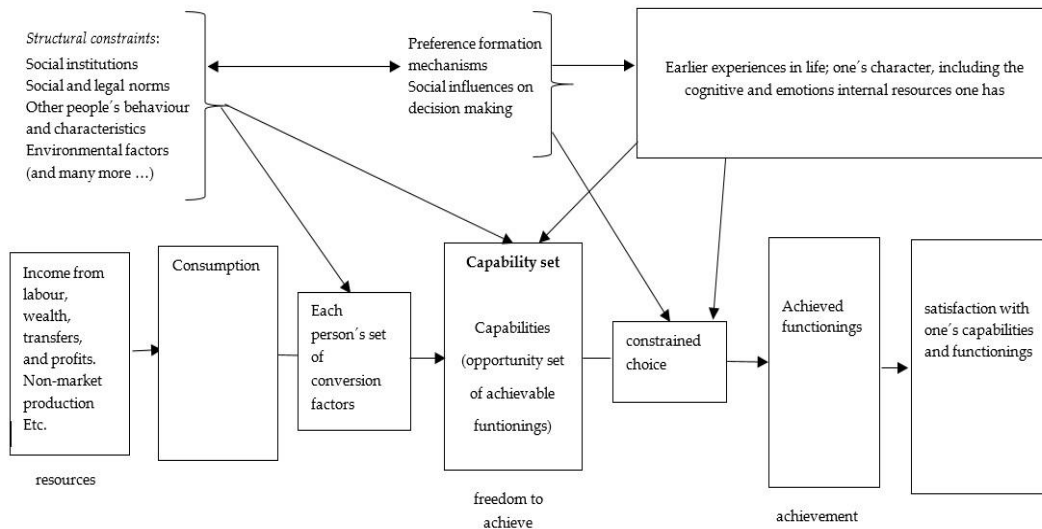
Fig.A1. Stylized visualization of the core concepts of capability theories
Source: Robeyns (2017)

Appendix B

Table A1. Structure of the SPI

Basic Human Needs	Nutrition and basic medical care	Undernourishment
		Depth of the food deficit
		Maternal mortality rate
		Child mortality rate
		Deaths from infectious diseases
	Water and sanitation	Access to piped water
		Rural access to improved water sources
		Access to improved sanitation facilities
	Shelter	Availability of affordable housing
		Access to electricity
		Quality of electricity supply

		Household air pollution attributable deaths
	Personal safety	Homicide rate Level of violent crime Perceived criminality Political terror Traffic deaths
Foundations of Well-being	Access to basic knowledge	Adult literacy rate Primary school enrollment Secondary school enrollment Gender parity in secondary enrollment
	Health and wellness	Life expectancy at 60 Premature deaths from noncommunicable diseases Suicide rate
	Access to information and communications	Call phone subscriptions Internet users Press Freedom Index
	Environmental quality	Wastewater treatment Outdoor air pollution attributable deaths Biodiversity and habitat Greenhouse gas emissions
Opportunity	Personal rights	Political rights Freedom of expression Freedom of assembly Private property rights
	Personal freedom and choice	Freedom over life choices Freedom of religion Early marriage Satisfied demand for contraception Corruption
	Tolerance and inclusion	Tolerance for immigrants Tolerance for homosexuals Discrimination and violence against minorities Religious tolerance Community safety net
	Access to advanced education	Years of tertiary schooling Women's average years in school Inequality in the attainment of education Globally ranked universities Percentage of tertiary students enrolled in globally ranked universities

Source: Methodology Report, SPI (Stern et al. 2014).

Appendix C

Table A2. ICT usage sub-index of the NRI

Subindex	Pillar	Indicators
Environment	Political and regulatory environment	Effectiveness of law-making bodies Laws relating to ICT Judicial independence Efficiency of legal framework in settling disputes Efficiency of legal framework in challenging regulations Intellectual property protection Software piracy rate Number of procedures to enforce a contract

		Time required to enforce a contract
	Business and innovation environment	Availability of latest technologies Venture capital availability Total tax rate Time required to start a business Number of procedures required to start a business Intensity of local competition Tertiary education enrollment rate Quality of management schools Government procurement of advanced technology products
Readiness	Infrastructure	Electricity production Cell network coverage rate International Internet bandwidth Secure Internet servers
	Affordability	Prepaid cellular tariffs Fixed broadband Internet tariffs Internet and telephony sectors competition index
	Skills	Quality of education system Quality of math and science education Secondary education enrollment rate Adult literacy rate
Usage	Individual usage	Subscriptions to cell phones Percentage of individuals using Internet Households with personal computer Households with Internet Access Fixed broadband Internet subscriptions Cell broadband Internet subscriptions Use of virtual social networks
	Business usage	Firm-level technology absorption Capacity for innovation Patent applications ICT use for business-to-business transactions Business-to-consumer Internet use Extent of staff training
	Government usage	Importance of ICT for government vision Government Online Service Index Government success in ICT promotion
Impact	Economic impacts	Impact of ICT on business models ICT PCT patent applications per million population Impact of ICT on organizational models Knowledge-intensive jobs, % workforce
	Social impacts	Impact of ICTs on access to basic services Internet access in schools ICT use and government efficiency E-participation Index

Source: The Global Information Technology Report (World Economic Forum 2016b).

Appendix D

Table A3. Countries analyzed in this study with information from the GEM; World Economic Forum, Social Progress Imperative, and World Bank, 2016.

Country		
Argentina	Germany	The Netherlands
Australia	Greece	Peru
Austria	Guatemala	Poland
Brazil	Hungry	Portugal
Bulgaria	India	Russia
Cameroon	Indonesia	Saudi Arabia
Canada	Iran	Slovakia
Chile	Ireland	Slovenia
China	Israel	South Korea
Colombia	Italy	South Africa
Croatia	Jamaica	Spain
Cyprus	Jordan	Sweden
Ecuador	Kazakhstan	Switzerland
Egypt	Libya	Thailand
Salvador	Lebanon	Turkey
Estonia	Macedonia	United Kingdom
Finland	Malaysia	United States
France	Morocco	Uruguay
Georgia	Panama	

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SUSTAINABLE AGRICULTURE IN RUSSIA: RESEARCH ON THE DYNAMICS OF INNOVATION ACTIVITY AND LABOR PRODUCTIVITY

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Abstract. The article examines the dependence of the growth rates of labor productivity on the growth rates of investments in fixed assets in Russian agriculture. The approach used in this work to assess the intensity of innovation activity in agriculture is based on the ratio of investment efforts and the resulting dynamics of labor productivity. It is revealed that in the period from 2013 to 2017, the growth rates of investments in fixed assets significantly exceeded the growth rates of productivity in the industry. The study of the dependence of the growth rates of labor productivity on the growth rates of investments in fixed assets showed a rather close relationship between these indicators (the correlation coefficient $R = 0.57$). The average coefficient of elasticity shows that given a change in the growth rate of investment in fixed assets by 1% of its average value, the growth rate of labor productivity in the period from 2013 to 2017 changed on average by 0.059%. The situation in Russian agriculture shows that in recent years, against the background of significant investments in fixed assets and growth of physical capital, the quality of this capital remained at a low level and could not ensure high and long-term growth in labor productivity. Additionally, an assessment of the intensity of innovation activity was conducted and an analysis of the factors was made, hindering the spread and introduction of breakthrough digital technologies.

Keywords: agriculture; digital technologies; innovation activity; labor productivity

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JEL Classifications: Q10, O30, J29

1. Introduction

A key factor in economic growth is the introduction of digital technologies (Litau, 2018; Romanova *et al*., 2017; Petrenko *et al.,* 2019). Digitalization opens up new opportunities at the level of interaction between enterprises, both in the format of horizontal cooperation within the framework of regional production and product clusters and within the framework of vertical cooperation between the links in the chains of creating added value.

The current level of digitalization of agriculture in Russia raises serious concerns. According to Rosstat, in 2017 the amount of investment in information and communication technologies of the AIC amounted to 3.6 billion rubles (0.5% of total investments in fixed assets). This is the minimum indicator in the industries, which indicates a low digitalization of the AIC (Rosstat, 2019). There is a number of factors in Russia, such as acute shortages of qualified personnel, low attractiveness of labor in the industry, the reduced life expectancy of the rural population and migration outflow of rural residents to the cities, that force agriculture to introduce digital, intellectual and robotic labor-saving technologies at an accelerated pace. Failure to meet the high production requirements adopted in the markets of foreign countries is an obstacle to the development of exports and can lead to crisis phenomena in domestic industries with high potential and dynamics of rapid growth as the domestic market is saturated (Ministry of Agriculture of Russia, & National Research University "Higher School of Economics", 2017).

These reasons predetermined the goal of the research – to evaluate the intensity of innovation activity in Russian agriculture. It is important to analyze the factors that impede the proliferation and introduction of breakthrough digital technologies by agricultural producers and suggest solutions to this problem.

2. Literature review

Since the beginning of the 2010s, digital technologies have been actively used in agriculture. Development in agriculture goes in parallel with the digital revolution in industry. Just as Industry 4.0 creates a so-called "smart factory", "Agricultural 4.0" creates a "smart farm enterprise" (TongKe, 2017). In addition to this term, such terms as "smart agriculture" and "digital agriculture" are often used (Kovács, & Husti, 2018; Pivoto *et al*., 2018).

The issues of development and introduction of innovative technologies in agriculture are reflected in many works (for example, Ognivtsev, 2018; Nikitin, & Ognivtsev, 2018; Harold *et al*., 2016; TongKe, 2017). The role of digital technologies in the agri-food sector is discussed in detail in the article by Kovács and Husti (2018). The interest of the researchers is attracted by the factors hindering the widespread introduction and use of digital technologies. The work is devoted to the search for prospects for digitalization for small and medium-sized enterprises (Nielson *et al*., 2018).

The studies on the differences in the economic growth of different countries and the role of capital accumulation and innovation in this process are widely presented in the economic literature (for example, Kumar, & Russell, 2002; Beaudry *et al*., 2005; Battisti *et al*., 2018; Bessonov *et al*., 2009; Zaitsev, 2016; Lavrovskii, 2018 and others). Acceptance of the decomposition of the contribution of technological progress and the accumulation of capital in the dynamics of factor productivity is widely used in scientific research. In this case, the authors use different assessment methods in different countries. Thus, Kumar and Russell (2002) use data for the period from 1965 to 1990 and come to the conclusion that capital accumulation plays a key role in productivity growth (78%), whereas the role of the technological development factor in their research makes up only 22%. Beaudry *et al*. (2005) also explain the differences in the economic growth of countries by capital accumulation. In other works, the factor of technological development in economic growth is given a more significant role – 44% (Battisti *et al*., 2018).

Quite a large number of works are devoted to the assessment of innovation activity and the level of innovation development. Despite the fact that research in this direction has been conducted relatively recently, a number of methodological approaches have already been developed. In particular, the issues of assessing the level of innovation activity are considered in the works by Makoveev (2016, 2015), Sharonov (2012), Baev and Soloveva (2014), Volkova and Romanyuk (2011), Novikova (2014), Bortnik *et al*. (2012). The problem of using a number of methods (for example, by Volkova) is that not all indicators proposed for evaluation can be obtained. In addition, the use of weight coefficients, based on a survey of experts, introduces subjectivity in the obtained results and reduces their reliability.

It should be noted that in most publications, the assessment of innovation development is based on the aggregation of private statistical indicators (Baev, & Soloveva, 2014; Makoveev, 2015, 2016). In the method by Makoveev, such indicators are used as the relative share of innovative products of manufacturing enterprises, the share of innovative products in the total volume of innovative products of the region, the level of innovation activity of manufacturing enterprises and the volume of shipped innovative products per an employee.

A review of the methodological approaches leads the authors to the conclusion that the assessment of the intensity of innovation activity needs to be clarified.

3. Materials and Methods

The approach used in this work to assess the intensity of innovation activity in agriculture is based on the ratio of investment efforts and the resulting dynamics of labor productivity.

The main provisions of the approach are based on the following reasoning: obsolete fixed assets can be reimbursed in one or another ratio based on, firstly, the latest technologies and equipment with fundamentally better specific indicators than the replaceable ones, and causing a significant increase in capital productivity; and secondly, with technologies and equipment similar to the substitutable ones, increasing productivity to a lesser extent with an increase in the capital-labor ratio. The condition for the stabilization or even reduction of capital intensity (capital-labor ratio) is the increasing efficiency of equipment and technology. Thus, the introduction of more and more modern technologies is able to slow down or even overcome the "tendency" to increase capital intensity.

The intensity of innovation activity can be measured by decomposing the increase in labor productivity into the factors generating it – the dynamics of capital productivity and the capital-labor ratio. Accordingly, the assessment of the intensity of innovation activity is part of the increase in productivity due to the dynamics of capital productivity. The more productivity growth exceeds the dynamics of the capital-labor ratio, ensuring a positive value of the rate of return on capital productivity, the higher the level (scale) of innovation activity is.

As is known, the labor productivity index (I_{LP}) can be represented as a multiplication of the indices of the capital-labor ratio (I_{CL}) and capital productivity (I_{CP}). Thus, the assessment of the intensity of introducing innovation (E_{IN}) will be considered to be the ratio of the growth rate of capital productivity to the rate of growth of labor productivity:

$$E_{IN} = \frac{I_{CP}}{I_{LP}} \qquad (1)$$

The intensity of the growth of fixed assets (E_A) will be the ratio of the growth rate of the capital-labor ratio to the growth rate of labor productivity:

$$E_A = \frac{I_{CL}}{I_{LP}} \qquad (2)$$

Another way to assess innovation activity is to compare the growth rate of specific investments and productivity growth. The intensity of innovation activity in terms of the growth rate of investment in fixed assets (E_{FA}) is as follows:

$$E_{FA} = \frac{K_i / K_{i-1}}{LP_i - LP_{i-1}}, \qquad (3)$$

where LP_i – labor productivity in the i-th period; LP_{i-1} – labor productivity in the previous period; K_i and K_{i-1} – specific investments in fixed assets in the i-th period and the previous period, respectively (per employee).

To study the effect of the growth rate of investments in fixed assets on the growth rate of labor productivity, a correlation and regression analysis was applied. To determine the parameters of the model, the least squares method was used. To determine the degree of closeness of the relationship between the signs, the correlation coefficient was calculated:

$$R_{XY} = \frac{\overline{XY} - \bar{X}\Box\bar{Y}}{\sigma_X \sigma_Y}, \qquad (4)$$

where $\overline{XY}$ – mean values of XY; $\bar{X}, \bar{Y}$ – mean values of X and Y, respectively; $\sigma_X \sigma_Y$ – standard deviation for X and Y, respectively.

The average coefficient of elasticity for linear regression is calculated by the formula:

$$\bar{E}_{YX} = b\frac{\bar{X}}{\bar{Y}}, \qquad (5)$$

It shows by how many percentage points the resultant attribute changes when the factor sign changes by 1% of its average value.

4. Results and Discussion

According to Rosstat, labor productivity in Russian agriculture for the period from 2012 to 2018 increased by 2 times, and in comparable prices in 2010 – by about 1.5 times (Table 1).

Table 1. Dynamics of labor productivity, investments and efficiency of using fixed assets in agriculture
(in comparable prices of 2010)

Indicator	2012	2013	2014	2015	2016	2017
Labor productivity, million rubles/person	0.47	0.50	0.53	0.63	0.66	0.73
Capital productivity, rubles/ rubles	1.02	1.06	1.08	1.09	1.10	1.08
Capital-labor ratio, million rubles/person	0.46	0.48	0.49	0.58	0.60	0.67
Investments in the fixed assets, million rubles	413.62	429.75	397.07	348.92	392.61	430.77

Source: (Rosstat, 2019)

The dynamics of investments in fixed assets was characterized by a decrease from 2013 to 2015 and its gradual growth in subsequent periods. In 2017, investment in fixed assets reached the 2013 level. Against this background, the return on fixed assets grew to 2016 inclusively, after which it was replaced by a reduction. Unlike capital productivity, the capital-labor ratio of agriculture shows a noticeable growth, especially in the

period of 2014-2015 (the period of activation of the policy of import substitution against the background of the imposition of sanctions and a retaliatory Russian embargo). At the same time, the dynamics of the labor productivity index throughout the entire period changes in the direction of the dynamics of the capital-labor ratio. In the period of 2012-2016, the difference in growth indices is 1-4 points in favor of productivity, but already in 2017, the growth rate of the capital-labor ratio exceeds the growth rate of labor productivity (Fig. 1), which indicates that there is the growth of capital intensity against the background of lagging growth rates of labor productivity.
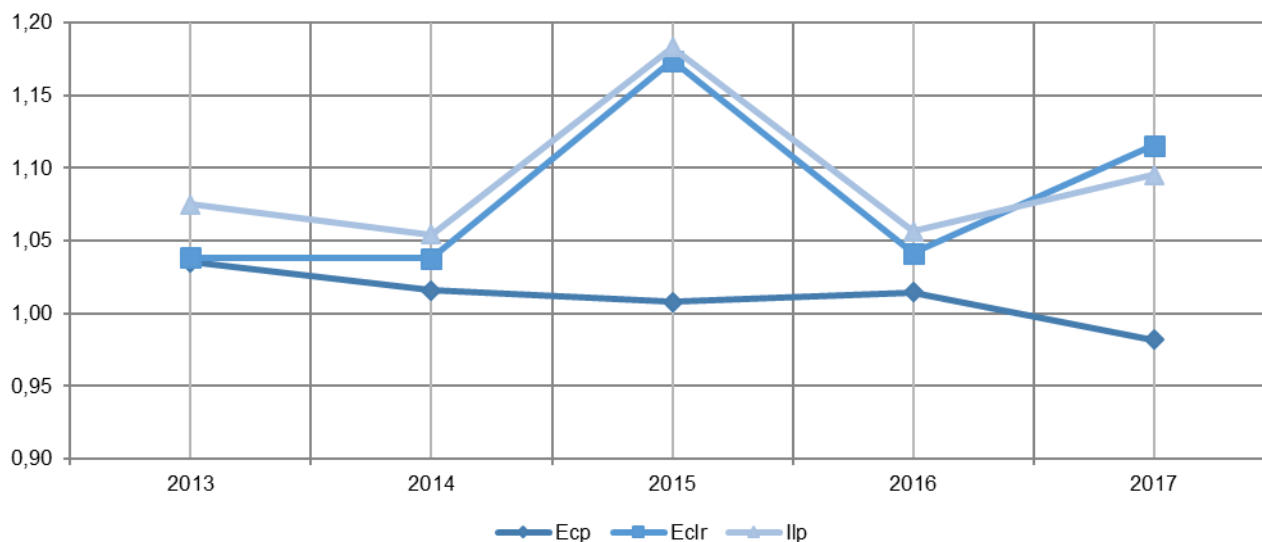
Fig. 1. Indices of growth of the capital-labor ratio, capital productivity and labor productivity in agriculture
(in comparable prices)

The policy resulted in a production reduction in the industry. Thus, according to Rosstat, in 2018, for the first time during the period of activation of the policy of import substitution, there was a decrease in output in comparable prices (Fig. 2), which was particularly significant in agricultural organizations (by 8.3% in 2018 compared to 2016) and farm enterprises (17%), while in the households of the population there was an increase by 4.2%.
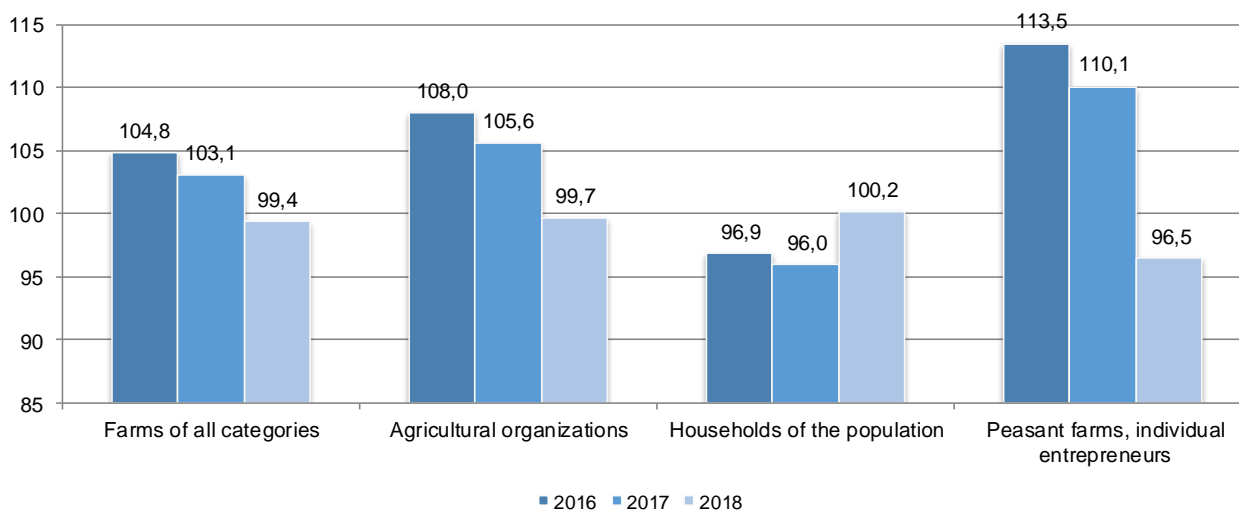
Fig. 2. Indices of agricultural production in farms of all categories (in comparable prices of 2010),
in percentage to the previous period

Source: (Rosstat, 2019)

During the examined period, the dynamics of the intensity of introducing innovation is unstable: growth in 2014-2015 was replaced by its deceleration for the next year and moderate growth in 2016-2017, while the extensiveness of the growth of fixed assets during this period increases steadily at extremely low rates (Fig. 3).
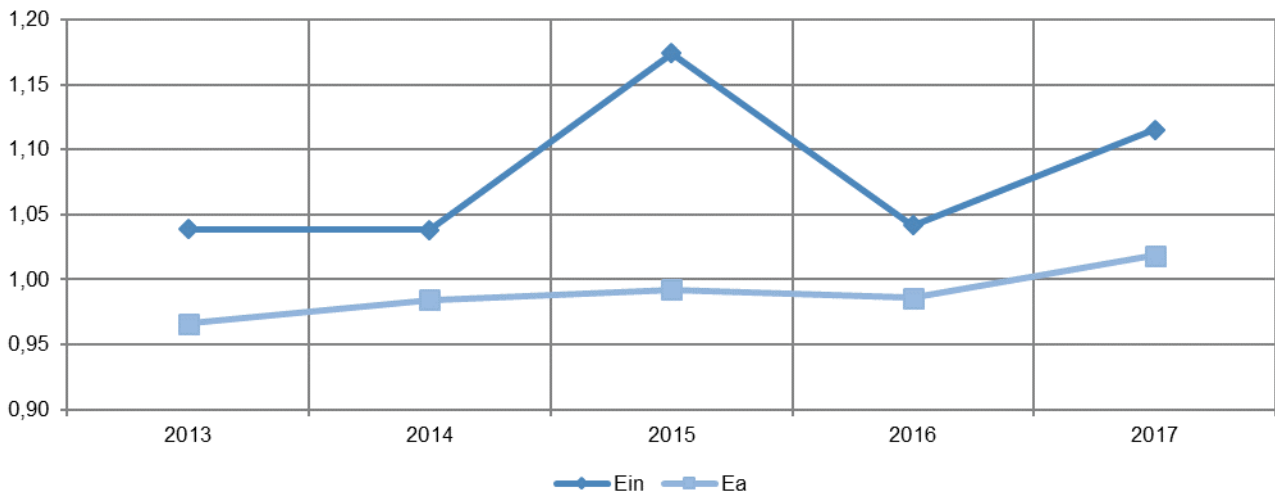
Fig. 3. The intensity of introducing innovation and the intensity of accumulating fixed assets in agriculture

Evaluation of innovation activity in agriculture on the basis of a comparison of specific investments (per person employed in agriculture) and the growth of labor productivity also showed an increase in 2015 (Fig. 4). In 2017, productivity growth in the industry was replaced by a fall, which ultimately led to a decrease in output in comparable prices in 2018.
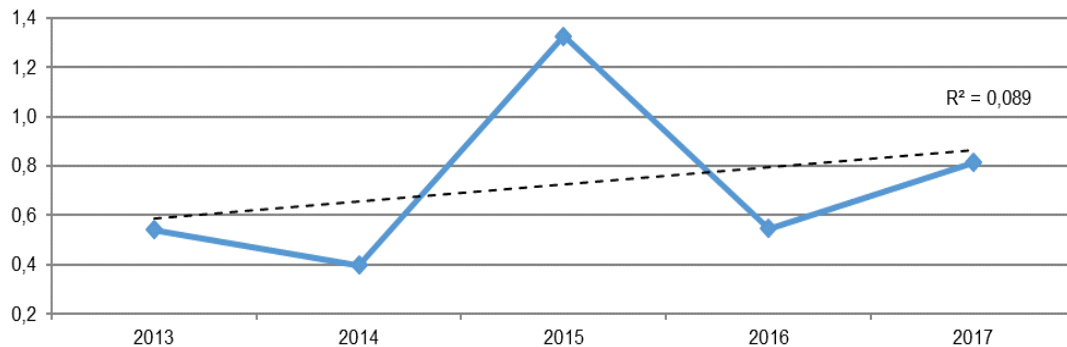
Fig. 4. The intensity of innovation activity on the basis of comparing the growth rate of specific investment (per employee) and productivity growth in agriculture

The study of the dependence of the growth rates of labor productivity on the growth rates of investments in fixed assets showed a rather close relationship between these indicators (the correlation coefficient R = 0.57). The graphic view of the relationship is shown in Fig. 5. The regression equation has the form $Y = 0.0031 + 0.0637X$. The average coefficient of elasticity ($\bar{E}_{YX}$) equal to 0.059 shows that with a change in the growth rate of investment in fixed assets by 1% of its average value, the growth rate of labor productivity in the period from 2013 to 2017 changed on average by 0.059%; in other words, the growth rate of investments in fixed assets significantly exceeded the average growth rates of labor productivity in the industry.
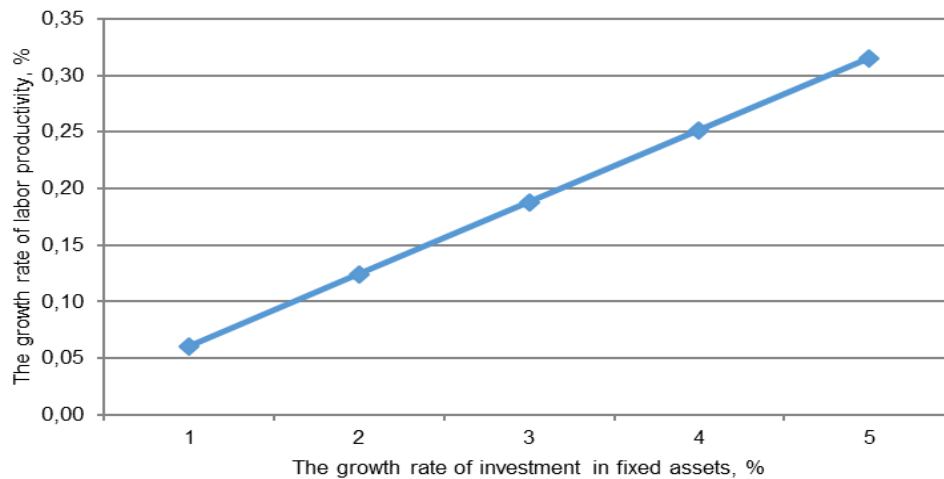
Fig. 5. The function of the dependence of the growth rate of labor productivity on the growth rate of investment in fixed assets
in agriculture in the period from 2013 to 2017

The identified difficulties with maintaining the statistics in the agricultural sector should be noted. According to previously published data by Rosstat, agriculture in recent years has grown at a rapid pace. However, according to the results of the 2016 All-Russian Agricultural Census, it was revealed that some data on agricultural production (in particular, in assessing the production of potatoes, milk, vegetables, fruits and berries) were overstated and subsequently adjusted downward.

The situation in Russian agriculture shows that in recent years, against the background of significant investments in fixed assets and growth of physical capital, the quality of this capital remained at a low level and could not ensure high and long-term growth in labor productivity. The cost structure by type of innovation activity is characterized by serious imbalances: more than half of the funds (58%) allocated for innovation are spent on the purchase of machinery and equipment (Baev, & Soloveva, 2014; Gokhberg, & Kouznetsova, 2009; Bessonov *et al*., 2009).

The reasons for this situation lie in weak innovation activity, lack of financial resources and low competitiveness of Russian innovations in the international arena (Sharonov, 2012). Russia is significantly inferior to the leading world countries in such indicators as the level of expenditure on research and development as a percentage of GDP, the relative share of organizations producing innovative goods and revenues from technology exports. The agri-food business is not encouraged to engage in innovation activity due to the lack of fierce competition in the domestic market after the introduction of the Russian ban on the import of food products from a number of Western countries, and, consequently, the lack of interest of Russian business to change something in their activities.

Comparison of the level of labor productivity in Russia and countries such as Germany, the USA, and Norway shows a gap in productivity in the economy as a whole by two to four times. This difference is by 53% due to the lower level of technology used in Russia, by 43% – due to lower capital-labor ratio and by 4% – lower quality of human capital (Zaitsev, 2016). Higher labor productivity indicators in developed countries are provided with both large amounts of physical capital per employed person and higher quality composition of this capital, as well as more efficient management and organization of production. A more rational organization of employment and high quality of management lead to lower losses in working time and costs. Whereas, the growth of the technological level of Russia can provide an increase in labor productivity by 1.6-1.8 times (Lavrovskii, 2018).

In addition, the quality of the institutional environment has a significant impact on labor productivity (Zaitsev, 2016; Kuzmin, & Barbakov, 2015). With a higher quality of the institutional environment, the same level of the capital-labor ratio can produce a higher volume of output. However, as Polterovich (2012) notes, high-quality institutions are neither a necessary nor a sufficient condition, and even good institutions are not a guarantee of productivity growth and economic growth. In turn, the low quality of the institutional environment hindered the creation and development of incentives for the introduction of more advanced technologies.

The institutional barriers which weaken the incentives for innovation are as follows: 1) a reduction in investment caused by both the low profitability of private investment (Berdyugina *et al*., 2017) and the low savings rate, 2) a decrease in expected utility from innovation due to the existence of institutional restrictions on competition (Baltserovich, & Zhontsy, 2012). The import substitution policy pursued since 2014 inevitably weakened competition in the domestic Russian market, creating more favorable conditions for domestic agricultural producers.

Summarizing, it can be noted that the main factors hindering the growth of the introduction of digital technologies in agriculture are as follows:
- lagging of rural areas in the development of digital infrastructure, access to digital technologies and the development of digital skills of the rural population. Significant reduction of digital inequality between rural and urban population in terms of access to the Internet and the presence of mobile devices did not reduce inequalities in the possession of basic digital skills, and digital inequality in the possession of advanced digital skills between rural and urban population continues to be very high (Sabelnikova *et al*., 2018);
- lack of financial resources for the introduction of digital technologies in the majority of agricultural producers. In the agro-industrial complex, a so-called bipolar economy is formed, where large agricultural organizations that have wide access to digital technologies and have been introducing them for a long time are concentrated at one pole, and at the other pole there are farms, especially small and medium-sized ones, that are working on the verge of payback using obsolete technologies.
- the level of software solutions that are currently widely available in the information and communication technologies market does not correspond to the needs of agricultural producers, who do not need separate elements of technology, but need a comprehensive solution (Chulok, 2019), etc.

Conclusion

The conducted study showed that in the period from 2013 to 2017, the growth rate of investment in fixed assets of agriculture significantly exceeded the growth rate of labor productivity. An assessment of the intensity of innovation introduction and innovation activity showed its short-term growth in 2015, its decline in 2016 and a slight recovery in 2017. The increase in the intensity of innovation activity in 2015 is associated with the intensification of the import substitution policy and the strengthening of state support for agriculture. However, after that, the import substitution policy inevitably weakened competition in the domestic Russian market, creating more favorable conditions for domestic agricultural producers. The absence of fierce competition in the domestic market and the introduction of breakthrough technologies and new-generation equipment, mainly in large agricultural holdings that received government support at the expense of small and medium-sized businesses, did not contribute to the growth of innovation activity in agriculture. Other obstacles to the development of innovation activity were the lack of financial resources, the lack of a sufficient number of Russian innovations and their low competitiveness in the international arena, with the simultaneous rise in prices for foreign technologies, and the low quality of the institutional environment.

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ENVIRONMENTAL MANAGEMENT SYSTEMS: AN EFFECTIVE TOOL OF CORPORATE SUSTAINABILITY[*]

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Abstract. The paper addresses corporate environmental policy concentrating on the current relationship of business activities towards environmental management in the Czech Republic. The pressure to adopt environmentally responsible behaviors motivates companies to initiate ecological practices, such as environmental and energy management systems, green balanced scorecard or green supply chain management. The efforts beyond the legislative requirements that are justified by potential cost reduction together with need for risk-based thinking, support investments into sustainable projects. This paper attempts to provide an in-depth view of the current enterprise practices and behavior in environmental management within the selected industrial sector in the Czech Republic region. Based on the mix of qualitative and quantitative approaches, the authors carried out structured in-depth interviews combined with a questionnaire survey with the aim to analyse the Czech environmental policy practices. A sample of 247 medium and large-sized Czech manufacturing companies was used for the survey. Three levels of environmental management system were identified: legal, basic and mature. The findings underscore the critical role of the management strategy approach and stakeholder requirements´ monitoring. The research revealed that an important atribute in environmental activies in business area is the ownership structure. The foreign ownership has positive impact on the level of environmental management system adoption. The study makes practical contribution in that it explains the mature environmental management system concept and shows a possible path in the environmental behavior to companies not meeting the requirements of the mature system. The authors highlight also the need for awareness raising of business owners and top management to increase their interest in being more involved in environmental activities.

Keywords: mature environmental management system; corporate environmental policy; environmental behaviour; sustainability concept

1. Introduction

Organizations are pressed to initiate ecological practices, for instance environmental or energy management systems (EMS, EnMS), green balanced scorecard and green supply chain management. Furthermore, legislative requirements, cost reduction pressure and a need for risk-based thinking push forward the motivation to invest in sustainable projects (Buganová & Hudáková, 2015). Social changes such as urbanization, sharing and circulation economy influence business activities, reflecting a growing public pressure and in the overall image of the company.

The basic sustainability concept of the tripple bottom line (3BL) encompasses three pillars of sustainability: economic, social and environmental. Environmental responsibility in the form of environmentally friendly and more efficient processes enables thus potential differentiation for businesses. The product and process innovations allow for additional benefits, including cost savings. From this point of view, the environmental responsibility should be seen as a competitive advantage and not only as an inconvenient cost (Porter & van der Linde, 1995; Moumen, El Idrissi, Tvaronavičienė, & Lahrach, 2019; Dabyltayeva & Rakhymzhan, 2019).

European countries have been recently intensively leading ecological policy initiatives and related regulatory reforms. Environmental rules and regulations in these countries are among the tightest in the world. Forced by internal or external factors, companies adopt also voluntary systems such as ISO certification (ISO 14001, ISO 50 001) or the EMAS scheme. As organizations are responsible for their environmental impacts, they must declare consistency with this legislative framework. Researchers need to examine environmental behavior within this existing regulatory framework and the Czech Republic is not an exception.

The authors Figueres et al. (2017) identified six sectors to cope with sustainable development, claiming that the fossil-free economy is already profitable. These sectors include energy, infrastructure, transport, land, industry, and finance. More attention should be given to the industrial sector with the most carbon-intensive industries, which are emitting more than one-fifth of the global CO^2, not reflecting their heat and electricity consumption. However, as Castro et al. claimed, industrial companies are bound by high legally and socially environmental pressures (Martín-de Castro, Amores-Salvadó, Navas-López, & Balarezo-Nuñez, 2017). However, they found out that most of the firms with EMS certification fail to effectively implement EMS practices inside the company. Zobel et al. came to the conclusion that the possible ISO 14001 certifications are valid as market signaling, presenting them externally to stakeholders. The phenomenon called symbolic environmental commitment, related to greenwashing practices, is not rare (Zobel, 2013).

Organizations need to reflect the sustainable actions even in the energy field specifically. Bearing in mind the instant innovations in renewables and the pressures to adopt ecological behaviors, organizations are pushed to make changes in the energy management. Renewable energy sources represent an important part of greenhouse gas reduction solution, approved by the EU climate initiative (20% reduction till 2020). From this point of view, the potential for renewable energy sources, pro-active environmental and energy behavior in the regional industry seem to be still lacking behind current trends in the developed countries.

In this context, small and medium enterprises (SMEs) play an important role in most economies. Recent research has focused on their impacts on the natural environment and on the wide range of the environmental strategies, the regulatory compliance, the proactive pollution prevention and the environmental leadership. A positive

competitive advantage was found to be related with the implementation of a green business strategy (Leonidou, Christodoulides, Kyrgidou, & Palihawadana, 2017).

This article focuses on environmental behavior of middle and large Czech industrial companies. The main goal of the research is the identification of different environmental behaviors of companies. Based on a pre-research, the authors revealed the possible existence of different levels of EMSs in manufacturing companies. The most important factors were examined and the current relationship of business activities towards environmental and energy management analyzed. Reasons for ecological behavior of companies were investigated: environmental responsibility as a potential differentiation between businesses and innovations, allowing for additional benefits including cost savings.

2. Theoretical backround

An increasing amount of literature, more or less related to the sustainability and environmental issues, has been published, analyzing the attitudes of companies from different perspectives. Already in 1987, the Our Common Future report (called the Brundtland Report), released by the United Nations World Commission on Environment and Development, outlined the sustainable development path (Brundtland et al., 1987). Afterwards, the essential sustainability concept of the triple bottom line (3BL) was introduced on the company level by (Elkington & Rowlands, 1999), and it was based on three pillars: economic, social and environmental sustainability. A similarity might be found also in the concept of corporate social responsibility (CSR). Lately, authors Kramer and Porter tried to broaden this concept by introducing the creating shared value, which should supersede the CSR framework (Kramer & Porter, 2011). However, the consistent definition of sustainability, together with the interdisciplinary approach and the system perspectives belongs to current environmental research challenges (Little, Hester, & Carey, 2016).

According to the natural resource-based view of the firm (Hart, 1995; Hart & Dowell, 2010), company resources represent the competitive advantage which cannot be easily copied by competitors of that firm. Moreover, the natural resource-based theory claims that close competitors differ based on the character of their resources and capabilities, including environmental performance (Barney, Wright, & Ketchen, 2001; Russo & Fouts, 1997). Some longitudinal empirical analyses reveal changes in environmental strategies and management attitudes towards company resources (Rhee & Yol Lee, 2007). Environmental innovations play a crucial role due to the positive effect on competitive advantage. Asking themselves the question "Does it pay to be eco?", authors Hojnik et al. concluded that introduction of eco-innovation might lead to positive and significant benefits (Hojnik & Ruzzier, 2017), Dixon-fowler et al. advocated the positive relationship between corporate sustainability practices and corporate financial performance (Dixon-fowler, Slater, Johnson, Ellstrand, & Romi, 2013) and RES are considered to be clean energy sources that minimize negative environmental impacts with positive future economic and social needs (Panwar, Kaushik, & Kothari, 2011). Moreover, RES belong to the core trends in the innovative product design and they have become part of sustainable manufacturing processes (Jawahir, Rouch, Dillon, Holloway, & Hall, 2007). However, researchers have been analyzing diffusion and implementation of RES technologies with not very optimistic results. Despite public efforts and governmental support, it has recently been a very slow process. In this context, the business model innovation is still an area that needs further investigation (Negro, Alkemade, & Hekkert, 2012). The reference to (Shin, Ellinger, Nolan, DeCoster, & Lane, 2016) shows a specific association between renewable energy source (RES) utilization and corporate performance, confirming the superior financial performance of companies that utilize RES in comparison to their industry competitors. On the contrary, some empirical studies show mixed results not fully supporting environmental management effect on the financial performance. A study by (Hitchens, Thankappan, Trainor, Clausen, & De Marchi, 2005) showed that companies with an average financial performance were comparable to high-performing competitors in environmental initiatives.

Based on Field et al., three groups of instruments for sustainable environmental resources management exist: direct regulations (command and control), market-based or economic duties such as taxes, subsidies, tradable permits and environmental liability, and voluntary (soft) instruments, which support proactive attitudes towards the environment (Field & Field, 2013). Voluntary approaches, together with command and control mechanisms, have been increasing, as they were promoted by governments, and having additional synergy effects on the environmental performance of facilities (Arimura, Hibiki, & Katayama, 2008).

The main voluntary tools influencing the company environmental behavior is the environmental management system (EMS) which aim is to develop, implement, manage, coordinate and monitor the environmental activities of organizations (Daddi, De Giacomo, Frey, & Iraldo, 2017; Melnyk, Sroufe, & Calantone, 2003; Sayre, 1996). Salim et. al (Salim et al., 2018) have described the global trends in enforcing environmental management systems, namely ISO 14001. In a research dated from 2000 to 2016, the authors emphasized the growing interest in ecological research. The important role of voluntary EMS can be seen in the form of achieving more sustainable production and consumption (SPC) practices. Sectoral studies revealed benefits of adopting an environmental management system. Benefits in the automotive sector include improvements in the market position of the company, in the relationship with stakeholders, in the environmental performance, and in the access to environmental technologies (Martín-Peña, Díaz-Garrido, & Sánchez-López, 2014).

Voluntary environmental certification schemes include the European EMAS regulation (Eco Management and Audit Scheme) and the ISO 14001 certification system. Both of them require organizations to introduce rules and procedures, to define environmental aspects and to improve their environmental performance (Daddi et al., 2017; Hillary, 2004; Testa et al., 2014). Both systems integrate environmental care into the business strategy as well as at the operational level. The main pillars of those systems consist of environmental elements, aspects, aims and procedures for an increase of the environmental performance.
ISO 14 001, an international private standard developed by the International Organization for Standardization (ISO) was issued in 1996 and, in 2015, a last version was published (ISO 14001:2015). The new ISO14001:2015 must be implemented by all certified organizations by September 2018. In 1993, the first EMAS regulation was launched (Regulation (EC) No 1836/1993) and in 2001 revised EMAS Regulation n. 761/2001 integrated the international environmental management systems based on ISO 14 001. The third revision was issued in 2009 (REGULATION (EC) No 1221/2009 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL, 2009) and new revision of the scheme is in progress (Preziosi, Merli, & D'Amico, 2016).

The adoption of the two instruments has different reasons. ISO 14001, as a minimum global-level requirement, is implemented in relation to external pressure - business partner requirements or company ratings and compliance. EMAS tends to be more internally driven and aims at improving environmental performance (Neugebauer, 2012). According to the International Organization for Standardization in Europe, ISO 14001 is adopted more than EMAS due to external pressures (Daddi et al., 2017), on the other hand EMAS supports environmental innovation for processes and products (Tourais & Videira, 2016). Analysis of the EMAS registration revealed that small firms were the vulnerable category as they faced difficulties in implementing EMS. The main reasons include internal factors: lack of resources (human and financial, time), short-term company orientation, awareness and, less important, insufficient external pressures and institutional problems (Daddi et al., 2017), (Preziosi et al., 2016), (Darnall, Henriques, & Sadorsky, 2008). Generally, a complex set of motivations is crucial for the decision to adopt environmental practices or not (Ayuso, 2006).

Along with the two main instruments, there are other voluntary international environmental standards, such as The Forest Stewardship Council (FSC) introduced in 1994 by a non-profit organization (Daddi et al., 2017). Alternative models of environmental management (AMEMs) include a wide range of sustainability management approaches (Beatrix Ransburg & Mária Vágási, 2007), such as The Natural Step (TNS) framework, which interconnects EMS with other environmental concepts, e.g. Life Cycle Assessment (LCA), ecological footprint,

and factor X. Product-oriented Environmental Management Systems (POEMS) is another practice which incorporates life cycle tools (Tourais & Videira, 2016).

Assessing the AMEMs is difficult due to data unavailability or intransparency. Many companies are not certified, hence the number of companies with AMEM is difficult to count (Heras & Arana, 2010). Specifically, authorization is often seen as one of the questionable aspects as companies might implement their own internal assessments, self-report to program managers, or are subject to external monitoring by an independent third-party auditor. Some interesting results regarding consequences towards environmental performance show that participants of voluntary environmental programs (VEPs) underperform those not implementing VEP, especially in comparison to self-monitor schemes (Darnall & Sides, 2008). Moreover, Melnyk et. al found out that companies with formal and certified EMS systems outperform those with formal but uncertified one (Melnyk et al., 2003). In the case of SMEs, introducing relatively simple and formal management tools, such as defining specific environmental targets, improve environmental impacts (Graafland & Smid, 2015).

Based on the literature, the size of a firm influences the proactive environmental practices. Small and micro firms tend to adopt proactive measures mainly driven by external aspects, by clients' requirements, competitors and entrepreneurs' attitudes, and strategic intents. As they are often part of structured supply chains and, tend to be influenced by client's requirements and behavior of competitors (Testa, Gusmerottia, Corsini, Passetti, & Iraldo, 2016), (Reyes-Rodríguez, Ulhøi, & Madsen, 2014), small and medium-sized enterprises (SMEs) have been increasingly integrated into global value chains facing requirements from value chain partners. Sustainable supply chain management is even more challenging since buyers tend to require more than a company does from their own suppliers (Lerberg Jorgensen & Steen Knudsen, 2006). On the other hand, some studies revealed lack of significant drivers to implement proactive environmental measures related to limited customer pressure (Nawrocka, 2008). Buyer – supplier relationship together with internal drive force might have positive effect on environmental capabilities in SMEs (Lee & Klassen, 2009).

Corporate environmental behavior is an emerging research field, which has been increasingly investigated, pushing for new environmental theories, such as the theory of environmentally significant behavior (Stern, 2000) which is interconnected with energy decarbonization policies (Stern, Sovacool, & Dietz, 2016). Corporate pro-environmental behavior is an important internal aspect, counting on some insights from environmental psychology. The voluntary pro-environmental behavior is in contrast with the organizationally prescribed behavior of employees modelled and explained by (Lülfs & Hahn, 2013). Utilizing Chinese panel data, authors He et al. analyzed factors influencing corporate environmental behavior (He, Xu, Shen, Long, & Chen, 2016). Both external pressures and individual corporate characteristics motivate enterprises to adopt active environmental behavior. Nevertheless, governmental environmental regulation has the most important effect. Therefore, corporate environmental behavior research should inform the environmental policy (Clark, 2005). In this context, managers´ values, attitudes, and perceptions influence either directly or indirectly corporate environmental response (Papagiannakis & Lioukas, 2012). According to Sarkis et. al., stakeholder pressure for the adoption of environmental practices results in three types of measures: eco-design, source-reduction, product life cycle assessment (LCA) and implementation of environmental management system practices (Sarkis, Gonzalez-Torre, & Adenso-Diaz, 2010).

Most business conflicts arise in the business environment as a result of an adverse event and uncertainty that destabilizes the integrity of the system of corporate social responsibility.

In line with the recently emerged research gaps in the broad field of sustainability approaches, we analyze current enterprise practices in the environment and energy fields within the selected industrial sector in the Czech Republic region. We examine the current relationship of business activities with environmental and energy

management. In addition, reasons behind the ecological behavior of companies are analyzed, i.e. environmental responsibility as potential differentiation for businesses (Khoma, Moroz, & Horyslavets, 2018).

A theoretical model linking market orientation and environmental performance was proposed examining the impact of business strategy on both individual employee level and firm level performances in environmental protection. It was found that market orientation positively affects environmental strategy, which then influences both environmental product quality and employees' environmental involvement (Chen, Tang, Jin, Li, & Paillé, 2015).

Czech manufacturing companies are usually certified by voluntary standard schemes ISO 14001: 2016 or EMAS. However, some doubts appear that EMS certified companies are unable to implement EMS procedures effectively. The authors explore this research problem so that different levels of EMS have been defined and tested. The authors defined the EMS levels based on current trends and requirements of the ISO 9001: 2016 standard and incorporated them into 9 research questions. Subsequently, first hypothesis was defined examining the relation of these aspects towards different EMS levels:

H1: Does a narrow relationship among the main items of EMS (9 questions) to a higher level of EMS exist?

The scope of the research questions is related to the results of the literature review and the requirements of ISO 14001: 2015 defined as follows:

Research questions

EMS1: The reason for implementing EMS

EMS2: Interaction of TOP management in EMS

EMS3: Defining the competences and responsibilities in the area of the environmental activities of the company

EMS4: Strategic concept for environmental policy till 2020

EMS5: Training of employees in the area of EMS

EMS6: Monitoring of current corporate environmental trends

EMS7: Reusing waste from production process

EMS8: Environmental risks and aspects through the whole product life cycle

EMS9: Involvement in environmental projects or other voluntary environmental activities

Studies in international business reveal that foreign firms have opportunities to outperform local firms when equipped with specific assets such as new technologies, well established management systems, and international experience. Foreign-ownership relations have been given little attention, espcially when it comes to the high standard of environmental management by foreign firms. A study by Kim et al. found that foreign firms are better performing than local firms in case they are under environmental pressure (Kim, Moon, & Yin, 2016). Moreover, this result is obvious in case of foreign firms originating from countries with relatively high environmental pressure. Their findings suggest that foreign firms can utilize better environmental management to address the demands of the host country. The authors found that the ownership structure might have a significant impact on the company's environmental approach and defined second hypothesis:

H2: The foreign ownership has positive impact on the level of EMS.

3. Methodology

Due to the complexity of the research objective, the authors proposed and conducted a multilevel study. Initially, the authors started with a preliminary research in order to detect and analyze in detail the current approaches in the environmental management. The preliminary research was based on two parameters – size of a company in terms of employee numbers (micro, small, medium and large) and type of core business activity (CZ NACE classification), both of them related to the requirements of the environmental management system according to the norm ISO 14001: 2015 Environmental system management - Requirements. The main goal of the preliminary research was the in-depth analysis of the attitudes towards solving environmental requirements in production

companies in the Czech Republic. This research was focused on 16 companies (micro and small, medium, large) from the most important industrial fields of the Moravian region. This qualitative research based on 34 structured questions led to detailed information about the research areas providing the benefits of personal feedback and detailed explanations. The results of qualitative research were processed by descriptive statistics. The research questions were divided into 4 areas: level of environmental system, environmental policy and communication, environmental performance monitoring and trends in environmental management.

Subsequently, based on this preliminary research, the authors cooperated only with the target group, namely medium and large production companies in the Czech Republic regardless of their core business activity (CZ NACE classification). The main part of the primary research was designed on the basis of the preliminary research results and the current requirements of ISO norm 14001: 2015. The main goal of this research is oriented towards the verification of the possible higher level of environmental management system engagement in comparison to the basic requirements of ISO norm 14001: 2015. Authors aimed to find out signs of proactive corporate environmental behavior in the Czech medium and large production companies. They exploited a frequently used database called Albertina, which includes information about 3 million companies from the Czech Republic and Slovakia, the business sector, the economic situation and direct contacts with owners and management.

The selected sector of the questioned companies involved about 5 000 medium and large production companies dealing with the norm ISO 14001: 2015 Environmental system management - Requirements. An electronically distributed questionnaire was used to collect the data. A final group of 247 large and medium-sized Czech manufacturing companies (5% success in return of the questionnaire) from different industrial branches participated in the survey. The differentiation of the companies based on the ownership status was decided as follows: 58% (143) domestic majority owner, 24% (59) foreign majority owner, 12% (30) subsidiary company – foreign majority owner and 6% (15) subsidiary company – domestic majority owner. To evaluate first hypothesis, the structured equation modelling was used. In first step, the exploratory factor analysis, was performed. To evaluate second hypothesis, the linear regression (LR) was used. The analysed data include also companies' annual reports, web pages and other public sources.

4. Results

Preliminary research
The research results are analyzed from two perspectives. Firstly, comparisons were made to analyze the differences among three groups based on the size of the company in terms of employee numbers – micro and small, medium or large company. Secondly, the different levels of EMS implementation between the two CZ NACE business fields were taken into account.

Results of the qualitative research show that although the micro-sized and small companies in the researched sample (3 and 3) fulfill the legislative requirements related to the environment, they do not implement any voluntary EMS. Moreover, any other elements of the EMS are missing in their management systems. The research sheds light into companies' voluntary EMS. The results show that there is no difference between the two groups of companies (CZ NACE 1 versus CZ NACE 2), in terms of implementation level. The outcome also indicates that core business area is irrelevant to the performance monitoring or EMS implementation level. Medium-sized and large companies are more devoted to the environmental activities, and more financial sources are available for an increase of information awareness. The most important environmental aspects mentioned in the survey include waste and water management, air protection, chemical substances management, packaging, accident prevention and energy management. These aspects are dependent on the core business of the company. The results indicate that the level of EMS requirement fulfillment is independent from the duration of EMS implementation.

In summary, the results indicate different EMS implementation levels. This different levels of EMS have been obvious in the following elements: strategy concept of environmental policy at least 3 years ahead, pro-active management approach, following trends and rules for internal communication. The authors conclude that a "tripple bottom line company" is an environmentally friendly enterprise optimizing its cost of environmental management and being aware of environmental risks.

Legal requirements must be fulfilled by companies regardless of the availability of certified environmental management system. However, research questions go beyond legal requirements, encompassing also environmental managements systems and other voluntary environmental instruments. The answers of the questionnaire are divided into three areas in line with interpretation of these three factors.

Legal environmental management system includes corporate environmental activities based mostly on the compulsory legal requirements. Responsibilities and authorities for environmental activities are not defined, employees are not trained in this area, and the environmental trends are not followed regularly. *Basic environmental management system* is based on the certifications implemented in the company and based on the intention of either the parent company or of the TOP management, which defines the policy and objectives of EMS. Moreover, they are active in reviewing the EMS - reminding the proposed objectives and appointing a representative or any other person as responsible for corporate environmental activities. No corporate environmental strategy is available, only short-term environmental policy and objectives have been defined. However, companies might consider waste reuse from production processes. These companies do not manage environmental risks and aspects throughout the whole product life cycle. Companies have applied *mature environmental management system*, which has been implemented on the basis of the TOP management strategy and stakeholders' requirements. A matrix of responsibilities and authorities is created across EMS activities and together with specific employee positions a long-term environmental strategy is defined. These companies manage environmental risks and aspects through the whole product life cycle and solve environmental opportunities as well. Companies reuse waste from production process. Training of employees in the area of EMS takes place on a regular basis in various forms, i.e. internal audits, regular internal training, participation at external trainings or conferences, and collaboration with universities or research institutions focused on the environment. Companies monitor current corporate environmental trends on regular basis.

Based on the preliminary research authors concentrate on medium and large production companies in the primary research with different environmental aspects and business areas.

Primary research

The first result from the correlation matrix based on the explanatory factor analysis indicated that EMS3 had low and negative correlations with all other EMS indicators. The indicator EMS3 was therefore eliminated from the next analysis. The results of correlation matrix are shown in the following table.

Table 1. The results of dependencies between factors without EMS3

		EMS 1	EMS 2	EMS 4	EMS 5	EMS 6	EMS 7	EMS 8	EMS 9
Correlation	EMS1	1.000	.514	.538	.510	.465	.013	.160	.166
	EMS2	.514	1.000	.504	.595	.526	.162	.306	.181
	EMS 4	.538	.504	1.000	.773	.561	-.064	.334	.197
	EMS 5	.510	.595	.773	1.000	.602	.072	.383	.251

	EMS 6	.465	.526	.561	.602	1.000	.127	.267	.356
	EMS 7	.013	.162	.064	.072	.127	1.000	.189	.205
	EMS 8	.160	.306	.334	.383	.267	.189	1.000	.182
	EMS 9	.166	.181	.197	.251	.356	.205	.182	1.000
Sig. (1-tailed)	EMS 1		.000	.000	.000	.000	.421	.006	.004
	EMS 2	.000		.000	.000	.000	.005	.000	.002
	EMS 4	.000	.000		.000	.000	.158	.000	.001
	EMS 5	.000	.000	.000		.000	.130	.000	.000
	EMS 6	.000	.000	.000	.000		.023	.000	.000
	EMS 7	.421	.005	.158	.130	.023		.001	.001
	EMS 8	.006	.000	.000	.000	.000	.001		.002
	EMS 9	.004	.002	.001	.000	.000	.001	.002	

Notes: Level of Significance equal 0.05; the results from IBM SPSS software

Source: the authors

Generally, the results of dependencies between indicators were statistically significant. After excluding the factor EMS3 a new factor analysis was performed.

Table 2. The results of Kaiser-Meyer-Olkin test and Bartlett´s test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.825
Bartlett's Test of Sphericity	**Approx. Chi-Square**	693.366
	Df.	28
	Sig.	.000

Notes: Level of Significance equal to 0.05; Df. – Degree of Freedom; the results from IBM SPSS software

Source: the authors

KMO (Kaiser-Meyer-Olkin) measure has achieved thevalue 0.825 with statistical significance of Bartlett's Test p<.0001. It is likely that a two factor model is more appropriate to describe relationship between main indicators of EMS. In order to define, which indicator belongs to which factor and factor loadings, the Varimax rotation was performed. The results of Varimax rotation might be interpreted as two extracted factors. The first factor grouping covers following indicators: EMS1, EMS2, EMS4, EMS5, and EMS6. The second factor group covers following indicators: EMS7, EMS8, and EMS9. Based on the statistical analysis, 59.68% of the total variance was explained. Pearson's coefficients of correlation (see table 1) have reached levels beyond 0.50, which indicates strong and statistically significant relation between variables (p<.0001). In the next step, structural model (AMOS software) of relationships between indicators of EMS was proposed (see figure 1).
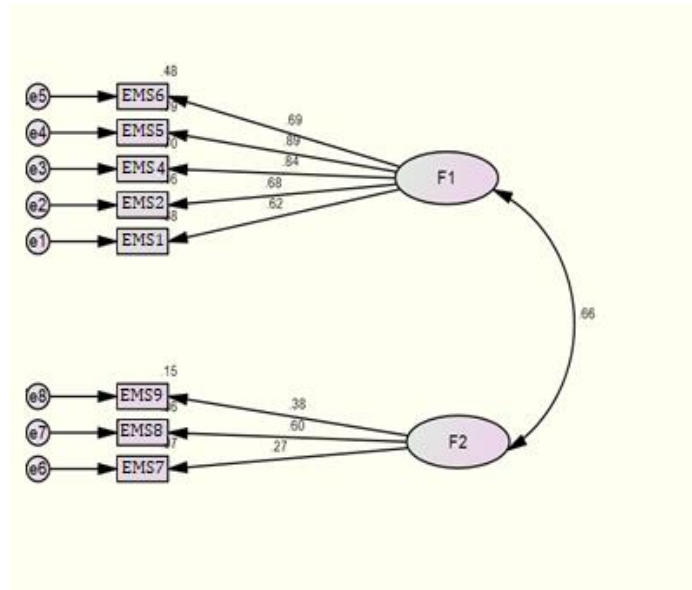
Figure 1. The results of Kaiser-Meyer-Olkin test and Bartlett´s test (standardised loading factors)

Source: the authors

The factor loadings reached the minimum limit (0.25 level). As a result, all factor loadings from the first group and the second group are acceptable. Based on this, FIT - characteristics of structural model had to be calculated (see table 3).

Table 3. The results of structural model Fit Summary

χ^2	χ^2/df	RMSEA	RMR	CFI	NFI	GFI	IFI	RFI
χ^2=40.66; df=17 (p<.001)	2.39	0.075	0.024	0.965	0.942	0.962	0.966	0.905
Accepted fit	<3	<0.08	<0.10	>0.90	>0.90	>0.90	>0.90	>0.90

Notes: Level of Significance equal to 0.05; Df. – Degree of Freedom; the results from IBM AMOS software

Source: the authors

The results of FIT characteristics indicate, that the variables have been grouped into two latent variables and CFA (confirmatory factor analysis) was carried out, applying the maximum likelihood method. The overall fit of the model to the data has been proven through value of Chi- square = 40.7, df=17 and their ratio Chi- square/df= 2.39, whereby the ratio lower than 3 suggests that model fits to the data. The other fit indexes were also observed and proved acceptable fit meaning that the first hypothesis is confirmed.

In case of H2, the method of linear regression was used to model the relationship between variables (owner structure of company (OSC) – the dependent variable, nine levels of EMS – the independent variables). The calculation did not aim to forecast the values of the variables, only statistically significant levels of EMS were determined. This idea of data evaluation was used in several quantitative studies (Hudakova, Masar, Luskova, & Patak, 2018); (Dvorsky, Rózsa, Petráková, & Kotásková, 2018).

The linear trends between the dependent variable and independent variables (EMS1; …; EMS9) can be seen in the results of the scatter plots. Graphical analysis of normal distribution of independent variables showed

divergencies between the histogram and normal distribution curve in the EMS1, EMS2 and EMS8 independent variables. The results of the testing of the descriptive characteristics (skewness: EMS1= 4.159; EMS8=7.654 and kurtosis: EMS1=4.744, EMS5=5.451) using the z-score confirmed that these independent variables do not meet the normal distribution assumption. The coefficients of correlation (through correlation matrix) between OSC and independent variables (EMS2, EMS3, EMS4, EMS6, EMS7, EMS9) proved a strong positive correlation. The results of the testing (α - the level of significance equal 0.05) carried out for the sake of verification of the statistical significance of regression coefficients (through t-tests) showed no statistically significant independent variables EMS6 and EMS7 (EMS6: t-value= 0.465, p-value=0.584; EMS7: t-value= 0.165, p-value=0.784). According to the results of t-tests, the independent variables (EMS2, EMS3, EMS4 and EMS9) are statistically significant (p-values of t-tests are less than α).

The function of the linear multiple regression model (with 4 independent variables) is:

$$OSC = 1.794 + 0.174 \times EMS2 + 0.148 \times EMS3 + 0.163 \times EMS4 + 0.131 \times EMS9 + \varepsilon t; \qquad (1)$$

whereby OSC – the dependent variable (Owner structure of company); EMS2, EMS3, EMS4 and EMS9 – independent variables; εt – error term.

The regression model is statistically significant (F- ratio =6.589; P-value=4.755E-5). The differences between the determination coefficient (R^2) and the adjusted determination coefficient are minimal (R^2 - 0.685 and Adjusted R^2 - 0.682). The Variance Influation Factor (VIF) demonstrated the absence of the effect of multicollinearity (VIF independent variables had lower value than the critical value 5 (Hair, Black, Babin, & Anderson, 2010): EMS2 = 3.684; EMS3 = 4.101; EMS4 = 2.145; EMS9 = 3,228). The autocorrelation was rejected for OSC function as Durbin-Watson statistics (D –W statistics = 1.547) indicated the value between the upper critical value (1.627) and the lower critical value (1.202). The results of the Shapiro-Wilk test showed that the assumption of the normality of the errors distribution can be confirmed because the p-value of S–W statistics (p- value = 0.07) is higher than level of significance.

The results of linear regression showed that the owner structure of a company has an impact on the level of interaction of TOP management in EMS (0.174); on the level of defining the competences and responsibilities in the area of company´s environmental activities (0.148); on the level of strategic concept for environmental policy till 2020 (0.163) and on the level of involvement in environmental projects or other voluntary environmental activities (0.131). The second hypothesis is confirmed as well.

Discussion

Studies point to the fact that the most important factor influencing the environmental performance of companies is the country's legislative framework. This has already been highlighted in a study mentioning that government regulation is the most important external factor effecting environmental behavior (Clark, 2005). The authors found that although the micro-sized and small companies meet the legislative requirements related to the environment, they do not implement any voluntary EMS. Medium-sized and large companies are more devoted to voluntary environmental activities.

Czech manufacturing companies are usually certified by standard ISO 14001: 2016 or EMAS. Daddi et al. (Daddi et al., 2017) highlighted the importance of a voluntary environmental management tool in development, implementation, management, coordination and monitoring of the environmental activities of organizations. Some studies point to the fact that EMS certified companies are unable to effectively implement EMS procedures.

This research confirms that most of the EMS-certified companies are unable to effectively implement EMS procedures as well. Authors investigating environmental behavior in medium and large ISO 14001: 2016 certified firms found that despite the EMS certification, there exist different EMS levels. The authors examined 9 areas (questions) related to the possible existence of differentiated EMS level. The research results point to a strong link between these environmental activities: high involvement of TOP management in the EMS implementation, maintenance and improvement of EMS and strategic concept for environmental policy till 2020, training for employees in the area of EMS and monitoring of current corporate environmental trends.

The second group of environmental activities relates to: reusing waste from production process, environmental risks and aspects through the whole life cycle, and involvement in environmental projects or other voluntary environmental activities. The final result confirms the hypothesis that there are companies with higher EMS levels.

This different level of EMS has been indicated in the following research areas: strategic environmental policy concept at least 3 years ahead, proactive management approach, trends and internal communication rules. Already in their study Papagiannakis and Lukas (2012), they highlighted the attitudes and values of managers influencing directly or indirectly the environmental response. Also the author Chen et al. (2015) stateed that the market orientation positively influences environmental strategy, which affects both environmental quality and environmental involvement of employees.

The second hypothesis was also confirmed based on the results. The foreign ownership has a positive impact on the EMS level. A study by Kim et al. found that foreign firms perform better than local firms in case they are under environmental pressure (Kim, Moon, and Yin 2016). Foreign companies are probably aware of the importance of environmental behavior not only from the global perspective, but also in their overall performance.

Conclusions

The paper addresses corporate environmental policy practices concentrating on the current relationship of business activities towards environmental management in the Czech Republic. This publication presents research results from the two subsequent research activities: preliminary in-depth company questionaire research and statistical modelling based on quantitative data. Three levels of EMS were identified: legal, basic and mature, and nine research questions were evaluated according to the requirements of ISO 14001: 2015. The research concentrated on the detection and testing of a higher level of EMS based on two hypotheses on EMS level and ownership structure.

The results confirmed that narrow relationship among the main items of EMS (9 questions) to a higher level of EMS exist, called *mature environmental management system*. This environmental management system is characterised by senior management strategy approach and monitoring of the requirements of the stakeholders. These companies have developed long-term environmental strategy, which is actively supported by all employees across the organization. Regular training of employees in the field of environmental issues takes place. Following the strategy, environmental risks and aspects are being processed and monitored throughout the product lifecycle. These companies are engaged in active implementation of environmental opportunities and reuse production waste. High levels of social responsibility awareness and new trends application into companies´ strategies are typical.

Moreover, foreign company owners have a better understaning of to the different levels of EMS in comparison to the domestic majority owners. The foreign ownership has positive impact on the level of EMS. The limitation of the research is related to the sample size and questionnaire feedback rate. The greenwashing effect needs to be

considered as well and for the future more research activities should be devoted to the EMS practices on the national level but also international level.

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CREATIVE MANAGEMENT OF THE ADVERTISING FORM AND CONTENT[*]

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Abstract. In the last few years there has been a fundamental change in the approach to advertising. Requirements of the recipients have changed, so there has been a demand for more and more creative and interesting forms. Its creativity is influenced by many factors that, when used together, allow it to become so. Both theoreticians and practitioners agree on the role of individual components that are used in the creation of advertising. Therefore, the aim of the article is to consider cognitive, theoretical and methodological as well as empirical issues on the possibilities of creative advertising process and analysis of the application of accepted standards for the use of specific forms and content in advertising messages, so that they ensure the highest efficiency and effectiveness.

1. Introduction

The level of creativity of advertising is conditioned by many determinants that make up the process of its creation. Their appropriate application allows the increase of attractiveness of the recipients. Advertising is a creative work and thanks to its reception it becomes creative or not. In order for it to happen, it requires the use of an appropriate form of communication. Therefore, to show a certain scientific area and subject it to the analysis, two trends were distinguished in the article. The first one has a cognitive character and is focused on the analysis of the source. These studies included foreign and Polish literature, which allowed making a critical analysis and shaping the research framework. They concerned concepts related to the creative process of advertising and the analysis of

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elements that make up an advertisement that meets its goals. The conducted descriptive and cognitive considerations constituted the foundation for analytical considerations. The second one, the research one, focuses on conducted qualitative research, as well as analysis of secondary data, which was used to develop a case study, thus allowing verification of the assumed hypotheses and research goal.

2. A multidimensional character of the concept of creativity. A review of the literature

The review of the source literature allows noticing that different authors interpret the issue of creativity differently, although it must be emphasised that in some aspects their views are convergent. Most concepts of the term are characterised by fuzziness and vagueness. It can be assessed both negatively and positively. It all depends on the research context that will be accepted by the researcher. Negatively, because the defectiveness of the used terms and definitions leads to numerous errors and misunderstandings. Positively, because the ambiguity of expressions, when it is known for what purpose they will be used, can be removed by appropriate definitional measures.

When reviewing the definitions, it should be emphasised that research on creativity focuses on several trends. The first of these includes theories dealing with personality traits that determine human creativity. The next ones focus on creative products and their production systems, but there are also such ones in which the primary empirical stress is put on the study of creative processes.

In order to be able to group research contexts, it is worth pointing out that significant are those ones that relate to human's individual characteristics which are predispositions towards performing creative work, creative process, but also towards social context, as it is the social perception of a creative work that determines whether it is such one or it is not. For example, creativity depending on various scientific trends, represented by the author of the definition refers to various experimental fields (Franková, 2011): thought operations (Guilford, 1967); the ability (potential) to solve problems (Getzels, Csikszentmihalyi, 1976); personality traits (Szobiová, 2004; Pietrasiński, 1978; Hlavsa, Jurčová, 1978, Eysencka, 1983, Nęcka, 2000); creativity and motivation: these approaches emphasise the close relationship between creativity and internal and external motivation (Amabile, 1983, Hayes, 1989); process and thought product (Kim, 1993; Cropley, 1999; van Woerkum, Aarts, de Grip, 2007; Mayer, 2008); interaction: creativity is a kind of interaction of the environment with the world (Goldberg, 1986; Hyatt, 1992; Bean, 1992); skill set (Smékal, 1995; Lubart, et. al., 2015).

Table 1. Definitions of creativity - literature review

Author	Concept of creativity
Stein (1953)	"Creativity as a process leading to a new product that is accepted as useful or acceptable for a certain group at a certain time"
Torrance (1965)	"Creativity as sensitizing to problems, deficiencies, gaps in knowledge, missing elements, disharmony, identifying difficulties, seeking solutions, attempts to formulate hypotheses regarding noticed shortages, repeated testing of formulated hypotheses and finally announcing the results of their work"
Guilford (1967)	"Creativity is the key to education in the fullest sense of the word and to solve the most serious problems of humanity"
Pietrasiński (1978)	"Creativity as an activity bringing products that were previously unknown and at the same time socially valuable"
Grzywak-Kaczyńska (1988)	"Creativity occurs when someone reveals specific abilities in some area of life to a degree far above mediocrity, using them to create works of greater or lesser social value"
Suchodolski (1990)	"Creativity makes the human being the only creature that is not enclosed in a tight framework of adaptation to external and internal reality, but who, faithful to his/her own transformations and perhaps even to chimeras, is looking eagerly and incessantly for new shapes of life. Creativity causes that the human being is not determined by what he/she is, but by what he/she becomes, because at the same time his/her life is not shaped by conditions that are given

	to him/her, but by visions to be obeyed, which means that his/her activity is not a repetition, but the courage of a new risk "
Cropley (2001)	"Creativity requires commitment, but also independence, it consists in making solutions, but also in their assessment, it is not the same as intelligence, but it is not species-different, either. It requires deep knowledge, but also release from its limitations, it implies calling something new to life, but can be studied without relation to the product, it "demands" the transgression of social norms, but only within the limits that society is able to tolerate "
Roger (2002)	"Creativity is the same as the creative process and activity leading to the creation of a new product, which is the result of the creator's unique personality on the one hand and the material, events and history of his life on the other. It is the ability to update oneself, to show one's own abilities and capabilities."
Zawadzki (2005)	"Creativity is everything that develops the old or establishes a new principle, aesthetic norm or unknown cause-and-effect relationship, that is, what detects the sources of phenomena, extends the scope of our knowledge, feelings, behaviours and which translates into a new element of the collective experience of societies , conventionally called culture "
Lubart, et. al (2015)	"Creativity is the ability to produce novel and adapted solutions in a specific context."

Source: on the basis on: (Guilford, 1967; Pietrasiński, 1978; Kaczyńska-Grzywak, 1988; Suchodolski and Wojnar, 1990; Suchodolski, 1990; Kłosińska, 2000; Zawadzki, 2005 and Lubart, et. al, 2015).

Moreover, there are also definitions that combine different aspects of the dimension of the concept of creativity. This type of definition represents: Amabile, 1996; Ford, 1996; Shalley, 1991; Perry-Smith and Shalley, 2003; Mayer, 2008.

Taking into account the specificity of creativity, it is impossible to arbitrarily determine which of the theoretical proposals is the most appropriate. The authors consider it justified to analyse it in a multifaceted dimension, taking into account its multidimensionality and synergic approach. Only the integration of multithreading experiences can lead to empirical conclusions that will have a revolutionary meaning for the development of this issue.

3. The creative process in the creation of advertising - selected theoretical and empirical aspects
3.1. The creative process - an attempt to define

The psychological process that leads to new and valuable solutions, and its final effect is a specific product that is called a creative process. It is often recognised as a processing cycle of complex information consisting of clearly separated phases (Dewey, 1988, Nosal, 1992 acc to: Andrzejewska, 2007; Bugaj, Szarucki, 2018; Garces, 2018). It refers to both everyday life and the creation of outstanding works. Moreover, it does not result from the projection of abilities, but it is a process of learning and acquiring competences (Staśkiewicz, 2004). The components of the creative process are eight mental sequences which include: (a) discovering and defining the problem, (b) coding available information, (c) categorizing available information, (d) selecting superior categories, (e) combining information and reorganising information categories, (f) development of the idea (idea of solution), (g) implementation of the idea (idea of solution), (h) monitoring of the effects of implementing the idea (idea of solution) (Sternberg, 2001).

The creative process is a complex mechanism and it is determined by many factors, and it starts with the appearance of a problem (it concerns questions about the scope of knowledge unknown so far or as a result of which there is no answer to the theses, etc.). It is an independent investigation into the knowledge gained both from appropriate sources in the course of formulating the problem, solving it, and finally verifying it, and from the one that is the solution itself to the problem. It takes the form of research activity that appears in a given situation and forces the subject (creator, researcher) to pose questions - problems, to formulate hypotheses and to

verify them through mental and practical operations. Its result is a specific work - the so-called creative product (Wełyczko, 2012; Sokół, 2015).

Most often the creative process presents itself in the form of stages, although it does not always have to take their form. The precursor of phasedness is Wallas (1926) (the stages of the creative process according to the author are presented below). He is the creator of the incubation theory in which specific phases are taken into account. The stages of the creative process are related to the awakening of creativity and listening to the opinions, remarks and proposals of subordinates; not *patronising* subordinates; creating a positive work atmosphere in which failures are accepted as a useful experience; a priority recognition of the development of subordinates by encouraging and entrusting them to do the job according to their qualifications; the reasons of mistakes, and not treating symptoms, avoiding by the superior suspicion in dealing with subordinates, taking into account one's own measure by superiors to subordinates (Skrzypek, 2009; Nichols, Stephens, 2013; Koch, et al. 2017; Sopińska, 2018).

3.2. The creative process in advertising

If the creative process in the advertising is be effective, it must be innovative in relation not to the accomplishment of a task, but to the goal to be achieved. This final effect of the advertisement, the way it is presented and its reception by a group of consumers to which it is addressed is what is expected from the creators of the advertisement. According to Hackley (1998), there are two dimensions of the creative process in advertising, which determine that it brings tangible benefits or not: organisational (Patwardhan, et al. 2009; Garbarski, 2018) and functional (Kover, 1995; Borghini, et al. 2010; Garbarski, 2018). It should be noted, however, that both these dimensions interpenetrate and through synergy create space for a better effect of the final creative work.

The first of them in, the source literature quite often refers to the internal and external environmental conditions that should be created for the creators to develop in this capacity. According to T. M. Amabile (1983, 1986, 1988), T. M. Amabile and D. Gryskiewicz (1987):

- these are: freedom or autonomy in making decisions related to completing the task; in this case, advertising;
- good project management, in which the manager is a model to follow, has enthusiasm resulting from completion of the task, high communication skills, can stimulate the team to work, controls the work of the team, but without limiting creative freedom;
- adequate resources and easy access to them;
- courage in undertaking new ideas and managing them;
- various organisational characteristics that create a system conducive to considering new ideas, co-action and cooperation;
- treating defeats not in terms of defeat;
- the use of a reward system for innovation;
- dissemination of the conviction about the high value of creative work;
- allocating the right time for creative thinking about the problem;
- shaping the sense of challenge resulting from the intriguing nature of the problem, its weight and importance to the environment;
- indication of the pressure or clear need generated by external factors towards the organization or by the need to complete something important.

Alternatively, the literature mentions the following factors that determine the success of creative advertising: agency ethos, the type of clients, the size of agency, the location of agency. Then, the features that an individual or team should have in order to effectively create creative works are presented. Creativity as a personality trait, to be properly used, is a constellation of predispositions which, by appearing together, allow obtaining the desired effect and effective implementation of the creative process. For example, according to R. J. Sternberg and T. I. Lubart the effectiveness of creativity is determined by the following resources, which are possessed by a human being as his/her predisposition or conditions created in the environment: cognitive resources (R 1 - intelligence, R 2 - knowledge, R 3 - cognitive styles); affective and volitional resources (R 4 - personality, R 5 - motivation); environmental resources (R 6 - environment).

On the other hand, the functional aspect concerns the creative process (focusing the deliberation on selected aspects presented in the further part of the article), which will be discussed in detail in this article. It is the process of creating advertising and using creative tools and methods in it, so that the final effect, that is, the advertising would be satisfactory in view of the novelty for the recipient.

The process of creating advertising can be divided into such stages, as analysis of the existing situation, strategic planning, creation and control. It is worth mentioning that the initial stage called the creation is not, despite appearances, an idea made up of nothing. Creative ideas developed as part of advertising often require practical knowledge. The creative process in advertising can be divided into two stages, in which tools and methods of creative work are used - the conceptual stage in which the idea arises, and the implementation stage in which the effect is developed. The first one deals with the analysis of the existing situation and the search for new approaches to the issue, so as to be able to surprise the recipient of the advertisement. At this stage, creative sources of inspiration are sought for on many levels that can be applied, i.e. the type of the recipient and his/her perception and the most effective means of receipt adapted to him/her, i.e. the choice of the type of advertising and the way of its presentation. Creativity at the conceptual stage level always involves in-depth analysis of what can then be challenged and, in consequence, surprise the audience. The latter aspect was examined from the side of customers / recipients (Hill, Johnson 2004 and Peszko, Sokół, 2016). Such focused research refers to the public perception of a creative work, but it determines the conceptual process when creating the advertisement. Because this will ultimately decide whether it is possible to recognise advertising as creative or not and what conditions it must meet to become creative. Knowing the indications regarding the receipt of advertising and elements conditioning its creative nature it is possible to use them in the process of its creation.

4. Creative management of the form and advertising content by the advertising agencies - the authors' own investigations
4.1. Material and methods

In accordance with the described in the article ways of building advertising messages in the publication "Creativity and creativity in advertising media", in order that the management of the form and the advertising content was fully effective specific rules concerning verbal and visual attributes must be observed. In the case of the verbal part, the main attention is paid, first of all, to the length of the headline, which should not exceed two lines; placing the name of the brand and / or the benefits of having it. Sometimes the headline becomes the main content; which should also take the form of a short   sentence or constitute a two-syllable word.

Verbal attributes relate to maintaining balance, arrangement of compositions (in order to achieve clarity of the direction, the composition must be spread from the left to right edge. in the first place the perception registers an event in the upper left corner, ending in the lower right, darker elements, going to brighter from colour elements to ultimately a monochrome colour) (Peszko, Sokół, 2016), using the appropriate object size (according to literature it is assumed that the graphic should be in the central point, it should be greater than other elements contained in the advertisement; present: product or people using it, supported by visual metaphor, or other visual

procedures. well-known people strongly attract attention, related to the given brand when advertising the product; eye-catching women with vivid eye colours, families or men smiling or serious). Important is also the aspect of the arrangement of headings, saturation of the colour, number of colour layers, sharpness, clarity of the fonts as well as compliance with the visual identification system used and the prominent placement of the logo.

In order to strengthen the visual message, a number of activities that increase the attractiveness is used, among others (Peszko, 2016),

- food styling;
- disturbing the proportions of objects presented in the image;
- styling of the classic still life with the promoted object in the spotlight;
- using allusions or referring to works of art recognised in culture works of art,
- photographs, films or known threads;
- iconic illusion;
- using metaphors;
- and comparisons;
- tautology;
- visual ellipses;
- transmission using advertising teasers and / or story boarding.

The principles of building advertising messages from the composition side should also be respected: "The consumer starts his/her journey form the inside, and then moves from the upper left corner to the upper right. Then he looks at the lower left corner and ends at the right. Guided by this principle, the creative distribution of space allows a better effect and increases the efficiency of the message. As regards colouring, both in the case of the press, as well as in the outdoor and indoor advertising, it is important to preserve the contrast of the background and letters " (Peszko, Sokół, 2016).

The most creative solution used in messages are word games.

Like metaphors, they play a special role in slogans. The slogan is called a password advertising, whose task is to draw attention and encourage action or evoke specific emotions. When creating slogans, it is worth paying attention to the rules indicated by W. Budzyński in the publication "Advertising, Techniques of effective persuasion, which are, among others, originality and suggestiveness of the slogan, short range of words (3-5). Moreover, it should focus on the enterprise, on the product displayed in the advertisement; should be real, it should have the right sound and rhythm; be easy to remember: be easily absorbed by the ear, be consistent internally and encourage to action, as well as arouse positive associations and emotions, etc. (Budzyński, 2000).

The aim of the article was to analyse the application of accepted standards for the use of specific forms and content in advertising messages, so that they could ensure the highest efficiency and effectiveness. In 2016 in the book entitled Creativity and creativeness in the advertising media, the authors' research showed (Peszko, Sokół 2016):

- a strong role of music and sound as elements shaping, building and constituting for the respondents a significant element of the media message, accompanying during its entire duration. An exception is the Internet and telephone, where they are brought to the element at the initial stage of the message, which is an incentive to further action;

- in the case of verbal messages, humorous texts and simple messages are of particular importance in terms of impact on the recipient;
- advertising messages are expected to fulfill the entertainment function to a greater extent. In the case of messages that are to convey something important, the message should be characterised by simplicity, without having to guess what the advertiser meant. These indications translated into the type of exchanged advertisements most remembered, which were usually characterised by a humorous plot or the simplicity of the message, as well as catchy texts.

Hence, the aim of the study was to analyse the application of the principles of building advertising messages within the range of the form and content, and to evaluate the procedure for determining the details of the client's order. On the basis of the goal defined in such a way, the following research hypotheses were derived:

H.1. Advertising agencies use, to a varying degree, the principles of building creative forms and advertising content.
H.2. Social media are not fully used by the agencies to show possibilities of their portfolios in order to assess their implementation capabilities.
H.3. Advertising agencies determine the details of performing the valuation and executing orders according to their own standards.

The aim of the compilation was achieved and the hypotheses were verified on the basis of the results of the empirical study. The research was carried out in several stages to justify the research problem in the best possible way. In order to assess the extent to which the obtained results from quantitative research and described standards in the source literature translate into real activities, as well as secondary data analysis qualitative research were performed, the data were used to develop the study of the cases.

The method of the case study is defined as "empirical reasoning, which refers to the contemporary phenomenon in its natural context, especially when the boundary between the case and its context cannot be unambiguously determined" (Dańda, Lubecka, 2010). In its case, it is recommended to use combinations of different test methods. The most commonly used methods are: inter alia, participant or non-participant observation, interviews, experiments, analysis of stagnant data, including analysis of the documents, information or content analysis, etc. When preparing descriptions of the case study, the above recommendations were used, which composed sequentially the following stages:

1. At the first stage an analysis of the existing data was carried. The data derived from the firm websites of the analysed advertising agencies, on which the enterprises published their portfolios, i.e. they presented the advertising materials that they prepared. This activity was aimed at making a comparative analysis within the range of the described forms of creation and advertising content and its practical application.
2. At the next stage, a non-standard method of qualitative research was used, which was a combination of two research methods of this category. With its help, it was possible to analyse the way the advertising agency works on the form and content at the stage of determining the terms of cooperation with the client. By submitted offer requests, the agency had the opportunity to identify to what extent it uses briefs or it does not, what are its standards of cooperation with the client in the creation of the offer, what it offers. In addition, the answer allows classifying the type of agency to the types accepted in the literature and practice. Attention was also paid to social media possessed and used by agencies, in order to observe whether it is also possible to find work that they perform there.

Eventually the problem of researchers was presented with the help of multiple case study. This was the last stage in which analyses and conclusions from the conducted studies were taken into account. Below the methodologies and main conclusions from individual studies that allowed developing the case study are presented.

4.2. Results and discusion

4.2.1. Analysis of stagnant data from websites and identification of social media used by the surveyed enterprises

Through analysing the portfolio of advertising agencies on websites, a comparative analysis was carried out in the field of form management methods described in the literature and advertising content, and its practical application by advertising agencies and its customers. The following table presented in Table 2 shows the aggregate results of the analysed advertising materials of 11 examined entities (ten of the first selection and one additional received as part of the refusal received during offer requests). In order to preserve the anonymity of the surveyed entities, the description of the Agency was introduced - its plus number for easier identification of the location. The analysis was focused on outdoor materials and materials used for image purposes such as exhibition walls or billboards.

In the case of the analysed materials, the advertising message consists of verbal elements (the headline and the proper text) as well as visual elements (illustrations and graphic design). Through the common occurrence of these elements, its effectiveness and efficiency increase. The image is both colours, shape and effects, the purpose of which is to evoke involvement in the recipient's sense of sight, and to attract attention for, at least, a few seconds.

Table 2. Outdoor advertising / exhibition walls, advertising boards of the surveyed agencies - the analysis of the applied principles of form and advertising content management

The applied principles / subjects examined	Applying activities that increase attractiveness	The preserved principle of how to build an outdoor advertising message	Graphics	The rules related to the heading and content	The logo and colours	The application of a slogan that complies with the rules of creation
Agency I Nowy Sącz	Incidentally Activity: food styling, technique focused on synesthesia	The preserved principle of how to build an outdoor advertising message	Not always preserved rules of composition, too many graphics within a single image, or the dominance of text over graphics, a significant part of projects, a large part of projects focused on the presentation in the form of an inscription	Preserved rules regarding the heading and text, short, not exceeding two lines, often headlines are the main part	Clearly displayed logo - colours compatible with the visual identification system	None in the presented projects
Agency II Lublin	Food styling, focusing techniques on synthesis, hyperbole, non-standard exposures - going beyond the format and size of the information board	The preserved principle of how to build an outdoor advertising message	The preserved principles of graphic composition, size of objects and proportions of the content	The preserved rules for the heading and text, short, not exceeding two lines, which complement the image	Clearly displayed logo-colours consistent with the visual identification system, the appropriate saturation and clarity of the images, in one case the colour composition was not preserved, which resulted in the merging of the	The used advertising slogans comply with the creation rules

					background with the images	
Agency III Łódź	Iconic illusions, Focus on the text forms of the game of colours	The preserved principle of how to build an outdoor advertising message	The preserved principles of graphic composition, size of objects and proportions of the content	Preserved, not short, not exceeding two lines, complementing the image or headings are the main part of the project	The logo shown - colours consistent with the system, visual identification, appropriate saturation and clarity of images, in one case no coherent visual identification system preserved - different typefaces of the fonts used	None in the presented projects
Agency IV Szczecin	Focus on the text forms and colours	In most implementat ions, the principle of building an external advertising message	In the case of placing, constituting an element of a larger whole	Indirectly preserved rules related to headings. Quite a lot of content, but a space between the messages is kept	The logo shown, in the part of implementation too many colours, within the frame of one message or colours not fully matched to the branch, saturation and clarity not fully preserved	None in the presented projects
Agency V Poznań	Food styling, iconic illusion	The preserved principle of how to build an outdoor advertising message	The preserved principles of graphic composition, size of objects and proportions of the content	The preserved, not short, not exceeding two lines, complementing the image or headings are the main part of the project	The logo shown - colours compatible with the system, visual identification, appropriate saturation and clarity of images	The used advertising slogans comply with the creation rules
Agency VI Dębno Małopols kie	Iconic illusions, food styling	The preserved principle of how to build an outdoor advertising message	The preserved principles of graphic composition, size of objects and proportions of the content	The preserved rules regarding the heading and text, short, not exceeding two lines, constituting a complement to the image or headings are the main part of the project	The logo shown - colours compatible with the system, visual identification, appropriate saturation and clarity of images	None in the presented projects
Agency VII Kraków	Focus on the text forms of the game of colors - Iconic illusions, technique focused on synesthesia	The preserved principle of how to build an outdoor advertising message	The preserved principles of graphic composition, size of objects and proportions of the content	The preserved rules concerning the heading and text, short, rarely used additional texts, headings that complement the image or being the main part of the project	The logo shown - colours compatible with the system, visual identification, appropriate saturation and clarity of images	None in the presented projects
Agency VIII Kołobrzeg	Hyperboles, tautologies	The preserved principle of how to build	The preserved principles of graphic composition, size of objects and proportions of the	The preserved rules concerning the heading and text, short, rarely used	The logo shown - colours compatible with the system, visual	None in the presented projects

		an outdoor advertising message	content	additional texts, headings that complement the image or being the main part of the project	identification, appropriate saturation and clarity of images	
Agency IX Białystok	Tautology, technique focused on synesthesia, hyperbole	The preserved principle of how to build an outdoor advertising message	The preserved principles of graphic composition, size of objects and proportions of the content	The preserved rules concerning the heading and text, short, rarely used additional texts, headings that complement the image or being the main part of the project	The logo shown - colours compatible with the system, visual identification, very high colour saturation, a frequently used contrast rule and high image clarity preserved	None in the presented projects
Agency X Gdańsk	Hyperbole, non-standard forms of shapes of advertising materials, tautology, application of comparisons, iconic illusion	The preserved principle of how to build an outdoor advertising message	The preserved principles of graphic composition, size of objects and proportions of the content	The preserved rules concerning the heading and text, short, rarely used additional texts, headings that complement the image or being the main part of the project	The logo shown - colours compatible with the system, visual identification, appropriate saturation and clarity of images	The used advertising slogans comply with the creation rules
Agency XI Bydgoszcz	Tautology, technique focused on synesthesia, hyperbole	The principle of building an outdoor advertising message is not always preserved	The preserved rules related to the heading, short frequently headlines are the main part of the project, in the case of the text they dominate in the messages of numerous implementations	The logo shown - colours compatible with the system, visual identification, appropriate saturation and clarity of images, frequently used colour contracts	None in the presented projects	None in the presented projects

Source: the authors' own work

Too many typefaces, or the placement of many small objects reduces the clarity of the image, and thus also that of the message. The shape is designed to evoke certain associations or emotions. Also, the proper composition of the whole is important. In the case of the agencies under analysis, in the majority of cases the rules of proper management of form and advertising content are observed. In individual cases, the supersaturation of the amount of content over the visual aspect occurs. The surveyed enterprises, in their implementations, also apply activities that increase attractiveness. In some cases, the agencies on their sites indicated for what aspect they were responsible during the implementation, however in the dominant part of the studied entities there was no such information, hence it is also difficult to clearly state how much they influenced the created composition, its content and form. Moreover, during the e-mail survey the aspect of the subject's influence was examined. The results of the survey were presented in the case study.

4.2.2. Methodology and results of the analysis of the substantive content of e-mail correspondence

The applied method is an unconventional form of qualitative research. It is a combination of the studies of the content analysis with the adopted method within the framework of the projection methods used in focus studies. As the method of selecting the examined group, the analysis included agencies that met certain criteria.

As a starting point it was assumed that each selected unit was to represent a different part of Poland, so as it would be able to eliminate the possible doubt in terms of conditions for the development opportunities of a given enterprise. Moreover, in the study Warsaw was not taken into account due to the place of the seat of the agency, due to the determinants flowing from the market, which are conditioned by the headquarters of the majority of corporations, applying global standards.

As a criterion for selection, it was assumed that the selected agency must have available on its website a portfolio that will enable comparative analysis. Large and smaller agencies were accepted in order to make possible comparisons, whether the size of the company and the time of its operation on the market have an impact on the range of the offer and its creativity resulting from the long functioning or the back office of employees.

A request for proposal has been sent to 10 selected advertising agencies, as part of which the initial implementation need was specified:
-   Developing a logo and advertising slogan - it is indicated that the client has ideas, but we do not know if they are suitable.
-   Preparation of advertising materials, i.e. advertising leaflets, roll-ups and a banner.

The e-mail also asked about the way of execution or whether the offer inquiry should be prepared on the pattern of the indicated brief or only description of expectations regarding the logo and other materials should be made.

To determine the scope of the enterprise's implementation capabilitiesthe question was asked if the scope of work possibilities can be shown when the enterprise cannot complete the entire query e.g. is the enterprise responsible only for the printing   already ready-made materials. In addition, the subjects were asked if the implementation of advertising materials can count on consultancy of the agency in terms of colours, applied forms, etc.

The research took place between 18-30 April, 2019. The offer inquiry was directed to ten advertising agencies. Six replied, one of which refused implementation, hence, additionally, the query was sent to another advertising agency.

The test results are presented in the form of the statement in Table 3. The details have been introduced to the case study as a complement to information on the entities analysed.

Table 3. The test results Agency

Agency	The application of the brief	The presentation of the scope of work on the commissioned projects	The method of making the valuation	The accepted method of communication within the range of the management order (its form and content)
Agency I	NO	Transmission of the information from the client - preparation of 2/3 of the agency's proposals.	Prices according to to the price list.	The e-mail way, providing information on expectations about the client's order.
Agency II	The brief prepared after signing the contract	The information on the possibility of completing the entire order Marketing consulting was additionally indicated.	According to the price list.	The e-mail way, no personal meeting was required.

Agency III	No, the preferable message is to place an order describing expectations in detail.	Indication of necessary details to determine the next stages of work on the projects.	The cost estimate after providing detailed information about the order.	The e-mail way plus a telephone contact. A possibly detailed desription of expectations and information on formats, quantities, etc. are required
Agency IV	NO, sending the order describing in detail the expectations, formats, quantities, etc.	Information about the possibility of completing the entire order with a description of how to work after sending an e-mail with the details of the order.	Valuation after determining details.	The e-mail way, required specification of details in the scope of work on the creative and printing parts.
Agency V	NO, preferred meeting at which details or detailed e-mail arrangements will be fixed	Information on the implementation of the full scope of work after the meeting and discussion of details.	The valuation made after precise specification of the parameters in the case of printing and determining the details of the remaining elements.	Information on the implementation of the full range of work after a personal meeting and discussion of details. The possibility of e-mail work is allowed - acceptance of the offer, evaluation of projects, adjustments until obtaining the preferred result.
Agency VI	NO, no form, sending an order with information about the industry the enterprise name. Possible suggestions what the client likes.	Information on the possibility of completing the entire order, without providing details.	The majority determined according to the price list, with some inquiries for parameters.	The e-mail way, no personal meeting was required.

Source: the authors' own work

4.2.3. The case study

The method of the case study allows for an in-depth analysis of the examined issue. Solving scientific problems using the described method focuses on conducting tests in the form of a single or multiple case study (Słupinska, Szwajlik, 2018; Szwajlik, 2018).

The case study analysis was carried out based on the action scheme described in the source literature, covering seven subsequent stages (Grzegorczyk, 2015):

Stage one - determining the subject matter and goals

The main objective of the study was to make an analysis showing the use of standards described in the literature used by advertising agencies in terms of forms and content in advertising messages. It was also important for the authors to analyse the design procedure at the stage of arranging details with the client.

Stage two - determining the subject of the case study

Entities that had an advertising portfolio on their website were selected for the study. The units came from different parts of Poland so that it would be additionally possible to observe whether there were location dependencies in the scope of the level and range of work. As an additional advantage of the selected entity, it was determined to have accounts in at least one social media, so as to determine how many projects can be found there. For the final description within the framework of the case study advertising agencies that responded to requests for proposals were accepted.

The seat and owned social media of selected entities are presented in Table 4.

Table 4. The seat and owned social media

The analysed advertising agency	The registered office	The owned social media
Agency I	Nowy Sącz	Facebook, Twitter (out of date - last publication in 2013), YouTube 9 last added material 8 months ago), Google+ (no longer an up-to-date social media)
Agency II	Łódź	Facebook (last publication of 2017), Twitter (out of date - last publication in 2013)
Agency III	Kołobrzeg	Facebook
Agency IV	Gdańsk	Facebook Pinterest, Instagram
Agency V	Lublin	Facebook, Youtube (last material in a given month)
Agency VI	Bydgoszcz	Facebook (redirected to a second account under a different name), Skype, Gadu-Gadu (inactive), Instagram (with information from Facebook, not thematically related)

Source: the authors' own work

Stage three - establishing contact with the subject of the case study

The analysis of substantive content of the content of mail correspondence of selected enterprises was preceded by the analyses of secondary information coming from the agency's website and social media related to the standard and offer being used as part of planning the forms and advertising content. This made it easier for the authors to prepare the content of the query sent to companies as part of the study.

Mail research was conducted in April 2019.
The form with the query was sent to the official website address of the surveyed companies.

In the case of secondary data analysis, the portfolio of ten selected advertising agencies on their official websites was analysed, as well as their social media for a desk research analysis.

Stage four - determination of the case study structure

In the beginning, the characteristics of individual entities constituting the case study are described. Then, based on the obtained data from the research: the analysis of secondary data-portfolio, social media and the research on substantive content of e-mail correspondence contents as part of which the work planning mechanism was presented as well as the level of applied standards and advertising forms, the method of form and advertising content management was defined by surveyed entities.

The case study was completed with conclusions in which the proposed directions of changes were additionally indicated.

Stage five - gathering information for the development of a case study

Within the framework of secondary sources, materials presented on the website and in social media of the surveyed entities were analysed. The main primary sources were the items of information gathered during the analysis of e-mail content. The information obtained was confronted with the knowledge shown in the compact publication developed as part of previous surveys and literature analyses. As a way of gathering information within the applied research methods prepared forms were used, that allowed gathering the obtained information from the studied enterprises into one whole and they also allowed for its possible comparability**.** The worked out tools facilitated the analysis process and made it possible to develop a case study on their basis.

Stage six - verification and evaluation of the collected research material

From the point of view of the purpose of the research, it was important to confront the results of the qualitative research (analysis of the contents of substantive content of e-mail correspondence) and the analyses of secondary data (data contained on the websites of the surveyed entities and in social media) with the information contained in the compact publication defining the standards for managing the form and advertising content (quantitative research). The authors are aware that the presented analysis has the character of pilot and demonstration studies, but constitutes the basis for further extended quantitative and qualitative research.

Stage seven - a written description of the case study

The first of the advertising agencies that decided on the valuation determined the amounts for the work in advance without asking for details or indicating how the implementation would look like. Asked about the process of preparing the whole logo and whether a personal meeting is necessary or information sent by the client via e-mail is enough "are the templates and names based on which we prepare proposals enough?"; "whether there are several variants or one in the sent price. "Within the range of the response, there was a brief piece of information that the information can be sent by e-mail and that the enterprise prepars 2/3 of the proposals.

The agency, as part of the preparation of its projects, which it presents on the website is guided by the principles of advertising design, however, it does not always refer to all of them linked with the management of the form and advertising content, especially in the field of graphic aspects. Often the headlines are the main part of the project. In the case of the presentation of their implementations in social media, single works appear there. This channel is not the source of information allowing for a wider understanding of the agency's capabilities. Some of the social media are out of date or the included materials have a distant date of publication.

The second of the advertising agencies presented the initial cost estimate, then it determined that the scope of services includes full marketing consulting. They prepare the brief after signing the order. The portfolio shows a lot of professionalism and adherence to the principles of form and content management. The composition of the verbal and visual parts is fully preserved. As part of the presented numerous implementations, there was only one case of not maintaining the coherence of the visual identification system in terms of the fonts used. Although the enterprise has information on the site about the use of social media, the profiles are not up to date, making it impossible for them to get to know the advertising agency's portfolio.

The third of the firms that responded to the query presented the entire implementation procedure - it stated that "from the submission of the project by the contracting authority, the preparation and sending of proposals for acceptance or implementation of changes takes place. After the projects have been approved, they are implemented. "An additional telephone contact was suggested so that the details could be clarified. Within the framework of the analysed projects, the reference to the principles of the composition is clearly visible. Dynamic hyperbolas and tautologies are often used as part of the techniques of making broadcasts more attractive. The creators' creativity is emphasised. The analysed agency shows commitment and willingness to help the customer in the implementation of the appropriate material. On the Facebook profile a rich portfolio can be found. The agency presents its implementations up to date and notes positive quotations in the form of "I like it" or positive comments of their work.

The fourth of the analysed companies, similarly to the previous one, also specified the query. It asked for additional guidelines, inter alia, what does the enterprise do and to whom addresses its offer (then it will show them the place for the logo and password creation). In the case of printing materials, they will develop design as tools for everyday work with clients and for trade fairs and they will produce and advise the best solutions, materials, expenditures depending on the purpose they are supposed to fulfill. As part of the implementation, it

can be seen that the agency is largely guided by the visual message, additional texts are rarely used. Headings that complement the image constitute sometimes the main part of the project. There are many different activities that increase the attractiveness of the message from hyperboles, tautologies, the use of comparisons, iconic illusions and non-standard forms of advertising messages to non-standard forms of the shapes of advertising messages. Social media very well allow getting to know the agencies from the design side. Thanks to the use of various social media channels, the enterprise can show up as part of the various possibilities of these communication tools. Numerous implementations can be found there and confidence in the appropriate creative management of the form and advertising content in the projects that are being prepared can be gained.

The fifth advertising agency, which indicated that it is able to undertake the implementation in great detail, presented its offer by conducting correspondence by e-mailing a more detailed query. In addition, it proposed a personal meeting to discuss the exact scope of needs so that an appropriate valuation could be prepared. After indicating the lack of possibility of a direct visit by the client, a possible e-mail contact was also indicated, within which the terms of the order will be detailed. The procedure of actions was presented - after accepting the offer, graphic designer prepares graphic designs and sends them via email for corrections. It has been specified that for each implementation, the so-called   material for the composition is needed (logo, ready texts, passwords, photos of products) and also suggestions, expectations as to the appearance, colour, etc. are welcome. As for the costs, the agency must know exactly what to do (what format, what product or image leaflet is it, how many products), it must know the parameters of printing (type, format, thick, thin or medium paper, whether there are any additional refinements, printing) to make a real valuation. The enterprise showed itself as professional both at the stage of detailing the order, as well as through its implementation. The presented portfolio shows extensive experience in creating advertising compositions that are to ensure high effectiveness of reaching target groups. The agency, apart from the standard forms of making the message more attractive, such as food styling, techniques focusing on synthesis, hyperboles, uses non-standard exposures, which shows its great creativity - going beyond the format and size of the information board. Thanks to such treatments, it provides much better recipients' attention. Facebook fulfills its communication, image and offer functions. It allows the possibility to analyse the way orders are managed.

The advertising agency, which refused to realise the order, explained that they will not undertake the task due to the number of orders. In the feedback it did not indicate the way of the conducted works nor did it ask about the time when the actions should be accomplished. In its place the query was sent to another advertising agency, which expressed interest, and invited it to place an order. After asking about the method of implementation and the scope of information needed by the agency to start work and determine the method of valuation, in response the enterprise stated that it does not use briefs nor any other forms. It needs information on what kind of industry it is, the name of the enterprise or any suggestions on what the client likes. In the scope of the valuation it presented the initial valuation of the logo and password preparation and it inquired about the size of the banner and the size and number of leaflets for the valuation.

As part of the portfolio analysed on the website of the enterprise, unfortunately it can be seen that the rules of building an external advertising message are not always preserved,   especially regarding the principles of graphics composition, the size of objects and proportions of content. In the case of the text, it dominates in the presented projects. The enterprise remembers about the rules related to the presentation of the logo and preservation of the visual identification system - the appropriate saturation and clarity of the images. It often uses colour contrasts.

The social media used may mislead the customer. Facebook redirects to the second account under a different name. The presented projects, which are placed sporadically, focus more on the offer of printing materials with customer photos. From the Facebook account one can find out that the enterprise also has Instagram, however it is

not thematically related to the advertising agency, it is a form of photo reportage from a trip. In the Gadu-Gadu example, it is not active.

Conclusions

In conclusion, only one of the advertising agency referred to the brief, within which the client's needs and preferences are determined in the scope of the order, four others make such a refinement on the basis of clarification questions. The level of the detail, however, differs significantly in the case of the surveyed enterprises. Only part of it provided information about the advice and assistance offered during the implementation in the field of preparation. Moreover, the valuation method was also predetermined in some cases with a price list which may raise concern or doubt about how complex the process of joint work, settlements and adjustments at the indicated price may be. In terms of the offers presented, no location or size dependency of the enterprise was observed.

Within the scope of the applied forms of management standards and advertising content described in the literature, it can be determined that the analysed entities know the principles of the management of the creative message content in terms of form and content, but their implementation level differs between them.

The described analyses made it possible to successfully verify the first and third hypothesis. The standards and rules described in the literature should be more of an inspiration for advertising agencies, as they are ready-made solutions that could provide them with even more effective advertising materials.

In the conducted research process, it was also noticed that it is worth honestly looking at the agencies in terms of the extent they use social media, which unfortunately do not meet, for most of the agencies, the communication channel that can serve them both to present their portfolio, as well as to build relationships and image. This allowed positive verification of the second hypothesis. It should be mentioned that the desired direction of changes would be greater involvement of the surveyed companies in shaping their image in the social media, i.e. Facebook or Instagram, and not only through the website. It requires time and effort, but it would certainly bring tangible added results for these entities.

The area analysed in the publication will be more widely studied and presented in the author's papers in subsequent publications. Moreover, thanks to the obtained conclusions, further areas were indicated, which will expand their research, among others by analysis of the use of social media by entities responsible for creative messages.

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DIVIDEND POLICY AND STOCK PRICE VOLATILITY IN INDIAN CAPITAL MARKET

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Abstract. As argued by Modigilani &Miller, the dividends are irrelevant only in perfect markets but in an emerging market like India, the dividends are expected to show its relevance. Indian capital market have surpassed a sea change in the recent past including demonetization, implementation of new tax regimes, political controversies and the like. Despite these facts, the Indian capital markets soars at many a times due to its active trading. Against this backdrop, this research paper seeks to examine the relationship between dividend policies and share price volatility. The motivation behind this research is to first time employ a powerful unbiased volatility estimator, created by Yang and Zhang that is 14 times as efficient as close to close estimate. A sample of 116 textiles companies, listed and actively traded in Bombay Stock Exchange of India (BSE) from 2008 to 2017 selected for the study. In examining the impact of dividend policy on share price volatility in Indian capital market, multiple least squares regressions is employed. Empirical results shows that dividends are affecting stock prices variations in India which fits in with the bird in hand and signaling theories of dividends. Due to the volatile nature of the market, Indian investors' prefer demanding more dividends from firms rather keeping retained earnings on reinvestment. The outcomes of this study supports the fact that dividends policy influence stock price variations in Indian capital market. The results of this study provides an insight to the financial managers in developing their dividend policies to maximizing the shareholders wealth.

Keywords: dividends; share price volatility; dividend payout

1. Introduction

Does a firm's dividend policy affect the company's stock price volatility? The answer remains controversial for decades among academic and professional communities despite abounding empirical research findings. Professional experts affirm that the stock prices volatile with dividend proclamations and some often argue that seemingly apparent relationship between dividends and stock prices as an illusion. As a pioneer in dividend policy decision, Lintner (1962) proposed the bird in hand theory that highlights the high certainty of dividend incomes over capital gains based on the time value of money. As a counterpart to this theory, Modigliani and Miller

(M&M) (1961) dividend theory of irrelevance declared that the firm's dividend policy decision does not affect the initial stock price for firms operating in a perfect capital market with fixed investment policies. M&M argue that shareholders can generate an equivalent homemade dividend at any time by selling shares and thus the dividend choice of the firm should not matter.

Financial economists started developing their prepositions based on the above two groundbreaking studies led to different and in many cases more contradictory findings. An approach by Gordon (1963) highlighted that paying larger dividends (and possibly investing less) reduces risk, which in turn may influence the cost of capital and hence the stock price. A similar study by Baskin (1989) suggested that dividend yield is not merely a proxy-dividends per se may influence stock market risk. DeAngelo et al. (2006) criticized Miller and Modigliani (1961) irrelevance theory of dividends payout to firms and investors' value and wealth, as they suggested that the theory resulted in restricting researchers' view about dividends payout. Several attempts by researchers in examining this relationship across European, Asian and Middle East markets found positive relationship between dividend and stock price changes (Gordon (1963; Baskin (1969), Hashemijoo (2012), Tsoukalas (2005), Marvides (2003), Hussainey (2011) detailing that dividend policy had an impact on stock price volatility.

As argued by M&M the dividends are irrelevant only in perfect markets but in a market like India, the dividends are expected to show its relevance. Liberalization, deregulation of financial sector, appointment of Narashimam committee in 1991 to reform capital sector, formation of Securities Exchange Board of India (SEBI) in 1992 as an apex regulator of capital market, opening of capital market to foreign institutional investors, demonetization all have led to a sea change in the Indian capital market in the recent past. Against this backdrop, this research paper seeks to examine the relationship between dividend policies and share price volatility aftermath the sea changes.

2. Review of literature

Dividend policy is a policy by which firms pay out earnings to shareholders versus retaining them for reinvestment in the firm. Therefore, dividend policy plays an important role in the firm's long-run financing strategies. In finance, valuation models equate a stock price with the present value of its expected future dividends. Gordon (1959) develops a model that relates the market value of the firm to dividend policy. According to this model, the dividend policy of the firm is relevant and that investors prefer a high dividend policy because dividends are less risky than the capital gain expected from an investment of retained profits. Investors are assumed to be rational and thus want to avoid risk which refers to the possibility of not getting a return on investment (Kumaraswamy, 2017). The payment of current dividends completely removes any chance of risk However, with retaining the earnings, investors expect to get dividends in future which are uncertain. The retained earnings represent a risky promise to investors.

Over the years, a number of dividend theories have been developed to explain the influence of corporate dividend policies on stock prices.
Dividend Irrelevance Theory: Miller and Modigliani (1961) propose that, in a perfect market, dividend policy is irrelevant to shareholders and that value of the firm is determined by its investment and financing decisions and not by dividend decision. This argument is based mainly on the assumptions of perfect capital markets which can be summarized as follows: (1) there are no tax, (2) no flotation or transaction, (3) information is symmetrical and cost less (i.e., all market participants have free and equal access to the same information); (4) there is no conflict of interests between managers and shareholders, and hence no agency costs; and (5) all market participants are price takers. Given these assumptions, Miller and Modigliani (1961) argue that all dividend policies are effectively the same to all investors. This is because investors can create "homemade" dividends through selling the appropriate portion from their stock holdings. Consequently, shareholders would be indifferent between dividends and capital gains. A number of empirical studies provide support for the dividend irrelevance theory.

Black and Scholes (1974) studied the effect of dividend policy on stock prices by investigating the relationship between dividend yield and stock returns using stocks listed on the New York Stock Exchange (NYSE). They find that dividend increase does not have a permanent impact on stock prices. They attribute the temporary changes in prices following dividend changes to investors' belief that the change in dividend is an indication of a shift in future earnings. Similar results are found by Miller and Rock (1985) argue that dividends are a tool for signalling information on earnings to the market, and, consequently, the price reaction to dividend changes is actually a reaction to earnings, rather than dividends. Moreover, Miller and Scholes (1982) and Bernstein (1996) provide evidence to support the irrelevance theory of dividends and confirm that dividend policy has no effect on the firm's stock price.

Bird-in-Hand Theory: The bird-in-hand theory developed by Gordon (1959; 1963) as a reaction to the dividend irrelevance theory by M&M. The hypothesis suggests that dividends can increase a firm value and shareholders wealth as, more certainty is attached to dividend payments received today, against earnings retention for investment in projects whose future earnings are not certain. He argues that the firm's current dividend policy creates an illusion about the firms' future dividends perceived by the investor, alter the level of uncertainty of dividends, which in turn impacts the returns on the shares. It was the arguments of this theory considered as the predecessor of the information asymmetry theory. Notwithstanding the wide criticism raised against this theory, there were empirical studies that supported the assumptions of this theory. Gordon and Shapiro (1956), Lintner (1962) and Walter (1963), Baker (1974), Brennan and Thakor (1990) La Porta et.al (2000). Notwithstanding the fact that the two theories are divergent Rubinstein (1976) claim that in perfect capital markets, both Gordon and M&M model provide equal shareholder value and do not rely on dividends.

Tax Theory: There are other theories such as the tax preference theory (Brennan, 1971; Elton et.al, 1970; Litzenberger and Ramaswamy, 1979) which propose that, in the existence of market imperfections such uneven tax treatments, dividend payments can decrease firm's value and cause negative effects on shareholders wealth. Because of the relative tax disadvantage of dividends compared to capital gains investors require a higher before-tax risk-adjusted return on stocks with higher dividend yields (Brennan, 1971). According to this theory, firms should, therefore, pay low or no dividends if they want to maximize their share prices.

Signalling Theory: However, one of their main assumptions of Miller and Modigliani's theory is that all investors have the same information about the firm and are able to understand and translate this information in the same way, as well as managers and investors have the same information and, hence the same expectations, about the firm. In real markets, however, asymmetric information between market participants exists and investors and managers have different information and expectations about the firm's future profitability and risk. Moreover, managers are likely to possess better information about the firm's future performance than outside investors and hence they may use dividend policy as a means to convey such information to investors (Bhattacharya 1979; Miller and Rock 1985; Bali 2003). Therefore, dividend policy can affect firm value by decreasing the information gap between managers and investors.

Agency Cost Theory: Moreover, Miller and Modigliani (1961) assume that there is no agency problems between managers and shareholders and managers are the best agents of shareholders. Easterbrook (1984) argues that the payment of dividends and the subsequent raising of external funds result in the monitoring of the firm by capital market participants. This monitoring reduces agency costs and thus increases firm value. Several studies have highlighted that paying dividends can serve as a tool to decrease agency costs that arise from the separation of ownership and control (Rozeff 1982; Chen et al. 2007; Wardhana and Tandelin 2018).

Dividend Policy and Share Price Volatility: The share price volatility has been used as a proxy of risk and it measures the rate of change in the price of a share over a given period of time. Many studies examine the relationship between dividend policy and share price volatility. Baskin (1989) use data from 1967 to 1986 of

2,344 US firms and find a negative relationship between stock price volatility and dividend yields. Such results indicate that firms with higher dividend yields are associated with lower risk. Similar results are noted by Allen and Rachim (1996). A significant negative relationship observed between payout ratio and stock price volatility. Earnings volatility and leverage found to be the major determinants of price volatility.

Consistent with this view, Rashid and Rahman (2008) investigate the link between share price volatility and dividend found share price reaction to the earnings announcement in Bangladesh during the study period produced insignificant results. Institutional settings in Bangladesh, the dominance of few shareholder groups and efficiency of the capital market are quoted to be the possible reasons for the insignificant results.

Nazir et al (2010) examined the impact of dividend policy on the volatility of stock prices in Pakistan. They use fixed effect and random effect models and find that the dividend policy has a significant impact on the stock price volatility. They conclude that by employing an effective corporate dividend policy, price volatility may be reduced. Consistent results were found by Hashemijoo et al (2012) who employed a sample of 84 consumer product companies listed in the main market of Bursa Malaysia to examine the relationship between dividend policy and share price volatility in Malaysia. They found a significant negative relationship between share price volatility with dividend yield and dividend payout. Similar results were found by Sadiq et al. (2013) who focus on non-financial firms listed on Karachi Stock Exchange.

Corporate dividend policy found to be a key driver of stock price changes in London as identified by Hussainey et.al (2011) in their research paper. The study utilized publicly quoted companies from the London Stock Exchange from 1998 to 2007 reinforce the fact that dividends are relevant in influencing stock price volatility. Similar findings were reported by Song (2012).

Jecheche (2012) carried out a similar research on 60 listed companies in Zimbabwe Stock Exchange during the years 2001 to 2011and found that dividend policy measures had a significant impact on the share price volatility showing shreds of evidence of arbitration, duration and information effect on Zimbabwe firms.

In a recent study, Zainudin et al. (2016) investigated the relationship between dividend policy and stock price volatility of 166 industrial products firms listed on Bursa Malaysia found dividend policy is a strong predictor of stock price volatility.

When it comes to Indian market context, Kumar (2016) investigated the impact of stock price volatility on CNX 200 index companies found a negative relationship with dividend yield. And the payout showed an insignificant relationship with stock price fluctuations.

As the literature suggests the dividends remain a puzzle and inconclusive with regards to stock price variations most specifically to markets where industries are operating. Furthermore, few research studies have examined the relationship between stock prices and dividend yield in Indian context using Baskin method to compute price volatility which ignores the closing drifts of stock prices. In an active and volatile market like the Indian Stock market, the drift values have to be accounted for in calculating the stock prices to be more efficient. Thus an attempt is made in this paper to fill out the gap by adopting a highly efficient volatility estimator proposed by Yang Zhang (2000).

3. Hypothesis development, data, and methodology
Hypothesis Development
H_1: There is no significant relationship between dividend yield and stock price volatility
H_2: There is no significant relationship between dividend payout and stock price volatility

Data

A sample of 116 textiles companies which are listed and actively traded in the Bombay Stock Exchange of India (BSE) has been utilized for this study from the year 2008 to 2017. Daily stock prices of the sample companies were collected from the BSE website and the data pertaining to dividend payout collected from Thomson Reuter's database. In order to eliminate the potential industry effects, a single sector was selected.

Variables' Definition: Independent Variable

Stock Price Volatility: The share price volatility which has been used as a proxy of risk is measured as the rate of change in the price of a share over a given period of time (close to close). The motivation behind this research is that this research for the first time employs a powerful unbiased volatility estimator created by Yang and Zhang (2000) that is 14 times as efficient as close to close estimate. This advanced volatility estimator is based on multiple periods of high, low, open, and close prices in a historical time series handle both opening jumps and drifts. In such an active market like the Indian capital market, since the possibility of opening jumps are considerably higher, an attempt is made to compute price volatility using the estimate of Yang and Zhang.

As the dependent variable in this study, price volatility is calculated for each year from 2008-2017 employing the following equation:

$$\text{Volatility}_{\text{Yang-Zhang}} = \sigma_{YZ} = \sqrt{F} \sqrt{\sigma_{overnight\ volatilty}^2 + k\sigma_{open\ to\ close\ volatility}^2 + (1-k)\,\sigma_{RS}^2}\ ) \quad (1)$$

where,

$$\sigma_{overnight\ volatilty}^2 = \sqrt{\frac{1}{n-1}\sum_{i=1}^{n}\left(Ln\left(\frac{o_i}{c_{i-1}}\right) - \overline{Ln\left(\frac{o_i}{c_{i-1}}\right)}\right)^2} \quad (2)$$

$$\sigma_{open\ to\ close\ volatilty}^2 = \sqrt{\frac{1}{n-1}\sum_{i=1}^{N}\left(Ln\left(\frac{c_i}{o_i}\right) - \overline{Ln\left(\frac{c_i}{o_i}\right)}\right)^2} \quad (3)$$

$$\text{Volatility}_{\text{Rogers-Satchell}} = \sigma_{RS} = \sqrt{\frac{F}{N}}\sqrt{\sum_{i=1}^{N} Ln\left(\frac{h_i}{c_i}\right)Ln\left(\frac{l_i}{o_i}\right) + Ln\left(\frac{l_i}{c_i}\right)Ln\left(\frac{l_i}{o_i}\right)} \quad (4)$$

$$k = \frac{0.34}{1.34 + \frac{N+1}{N-1}} \quad (5)$$

Dependent Variables

Dividend Yield is amplified as the dividend per share as a percentage of the stock price. The stock prices were collected from the BSE website and the proportion of D-yield to stock price is then computed.

Payout Ratio: The payout ratio is constructed as a percentage of the firm's earnings that is paid out as dividends to shareholders. Payout policy considers only internal factors in its computation whereas dividend yield is influenced by external factors as it utilizes stock price.

Control Variables
Firm Size: Firm size is calculated in terms of the market value in each year. A transformation using natural logarithm was applied to obtain a variable that reflects orders of magnitude.
Long-term debt: the proportion of long-term debt excluding capital lease obligations to total assets which included current assets, long-term assets, net intangibles, long-term investments, long-term notes receivables, and other long-term assets.

Earnings Volatility: For calculation of earnings volatility, firstly, the ratio of EBIT to the total asset is calculated for each year and then the results are averaged for ten years. Finally, the average of second power deviation from the overall average is computed and a square root transformation is used.

Research Model
In line with the renowned, pioneer work of Baskin (1989) in examining the association between the dividend policy and share price volatility, this research study analyses the relationship between the two variables by applying the correlation analysis and multiple least square regressions using STATA. In regression analysis, the dependent variable share price volatility is regressed against two main independent variables dividend yields and payout ratio. In line with the recommendations by Baskin (1989), a number of control variables were included to account for certain factors that affect both dividend policy and stock price volatility, debt, earnings volatility, and firm size. The following research model is adopted to develop a relationship between share price volatility and dividend policy.

$$\text{P-VOL}_{it} = \alpha + \beta_1 \text{D-YIELD}_{it} + \beta_2 \text{PAYOUT}_{it} + \beta_3 \text{SIZE}_{it} + \beta_4 \text{DEBT}_{it} + \beta_5 \text{E-VOL}_{it} + \varepsilon_{it} \tag{6}$$

Where $P-VOL_{it}$ is the price volatility for firm i during the year t; $D-YIELD_{it}$ and $PAYOUT_{it}$ are measures of a firm's dividend policy of firm i during the year t; $SIZE_{it}$ is the firm's size of firm i during the year t; $DEBT_{it}$ is the debt of firm i during the year t; and $E-VOL_{it}$ is the earnings volatility of firm i in year t.

4. Analysis of data
In order to identify the characteristics of the data to be regressed, tests for multicollinearity, homoskedasticity, and autocorrelation were conducted in this section.

Multicollinearity
To detect multicollinearity between the variables used in the regression analysis, two tests were employed; the Pearson correlation matrix (Table 1) and Variance Inflation Factor (VIF) in Table 2. The correlation coefficient matrix of the variables is less than 0.75 we conclude that the variables are free from multicollinearity. In addition, the results of VIF Table 2 also shows that the coefficient of the variables are less than 10, which indicates that there is no strong correlation between the independent variables.

Table 1. Cross-Correlation of Variables

VARIABLES	P-VOL	PAYOUT	D-YIELD	SIZE	DEBT	E-VOL
P-VOL	1					
PAYOUT	0.0046 0.8796	1				
D-YIELD	-0.1602** 0	0.1299** 0	1			
SIZE	-0.3736** 0	0.0321 0.2954	0.0992* 0.0012	1		
DEBT	0.0815* 0.0056	-0.0457 0.1276	-0.1120* 0.0003	-0.0691* 0.0212	1	
E-VOL	0.0631* 0.0318	-0.0414 0.1675	-0.0244 0.4274	-0.0755* 0.0118	0.0211 0.473	1

Source: 2008-2017 STATA output,* Significant at 5% ** Significant at 1%

From the results of correlation Table 1, payout shows a positive correlation with stock price volatility and the results are not statistically significant. The dividend yield has a significant negative association with price volatility as expected. These results are consistent with Kumar (2016) in the Indian capital market and from other studies around the world Hussainey et.al (2011), Song (2012), Hooiet.al (2015), Nazir et.al (2010), Sadiq et.al (2013) contradicts with Tahir (2017). Correlation tables also strengthen the significance of counting control variables in the regression equations. Price volatility has a highly significant negative relationship with market value and positive significant association with debt to total assets and earnings volatility.

Table 2. Variance Inflation Factor of Variables

Variable	VIF	1/VIF
D-YIELD	1.04	0.96381
PAYOUT	1.02	0.98007
DEBT	1.02	0.98148
SIZE	1.02	0.98198
E-VOL	1.01	0.99305
Mean VIF	1.02	

Source: 2008-2017 STATA output

White's test for Ho: Homoskedasticity
To proceed with the regression analysis, the White's test was conducted to test the homoskedasticity of the data included for analysis. The violation of the assumption of Homoskedasticity indicates that the standard errors are biased which will mislead the regression results. The results of White's test in Table 3 shows that the p values are greater than 0.05. This indicates that the data is homoskedastic and error variance is constant across all variables.

Table 3. Results of White's Test for Ho: Homoskedasticity

against Ha: unrestricted Heteroskedasticity	
chi2(20)	11.05
Prob > chi2	0.9448

Source: 2008-2017 STATA output

Wooldridge test for autocorrelation in panel data
Considering the nature of the data (panel) used in this study it is imperative to identify whether the correlation between variables exists at different points in time. For this reason, Wooldridge test is employed and the results are shown in Table 4. As the p values are greater than 0.05, we accept the null hypothesis which states that there is no first-order autocorrelation in the variables.

Table 4. Results of Wooldridge Test

H0: no first-order autocorrelation
F(1,   115) =   1.617
Prob > F =   0.2060

Source: 2008-2017 STATA output

Empirical Results and Discussion

A broad description of the characteristics of the variables used in the study is shown in Table 5 which reports their statistical means and standard deviations. The average stock price volatility at 0.055 with a standard deviation of 0.024 indicates that the stock prices movements across the same sample firms were identical. The average dividend yield of the sample firms shows at 1.36% with 2% standard deviation depicting that most of the sample firms have similar dividend values. Though the stock price movements are expected to be identical, the average payout of the sample firms is 0.122 with a standard deviation of 0.82. The earnings volatility of sample firms shows average volatility of 0.019 depicting consistent variations in the earnings of the sample firms.

Table 5. Descriptive Statistics of the Variables

Variables	Obs	Mean	Std.Dev.	Min	Max
P-VOL	1,161	0.055681	0.024615	0.018713	0.313567
PAYOUT	1,114	0.122572	0.821806	-14.2857	20
D-YIELD	1,064	0.01369	0.021494	0	0.20429
SIZE	1,113	6.365112	1.664092	1.9407	11.53311
DEBT	1,163	0.321785	0.26709	0	1.955509
EVOL	1,169	0.019079	0.022327	0	0.222739

Source: 2008-2017 STATA output

Results of Regression

This model includes share price volatility as independent variable regressed against dividend policy variables dividend yield and payout with firm size, earnings volatility and debt to total assets as control variables. The results of the regression analysis are shown in Table 6.

Table 6. Results of the Regression Model

Source	SS	df	MS	Number of obs	=	1,059
				F(5, 1053)	=	41.43
Model	0.10475	5	0.02095	Prob > F	=	0
Residual	0.53254	1,053	0.00051	R-squared	=	0.1644
				Adj R-squared	=	0.1604
Total	0.63729	1,058	0.0006	Root MSE	=	0.02249
P-VOL	Coef.	Robust Std. Err.	t	P>t	[95% Conf. Interval]	
D-YIELD	-0.1398	0.0327177	-4.27	0	-0.204	-0.0756
PAYOUT	0.00113	0.0008322	1.35	0.176	-0.0005	0.00276
SIZE	-0.0052	0.0004166	-12.47	0	-0.006	-0.0044
DEBT	0.00445	0.0027	1.65	0.099	-0.0008	0.00975
E-VOL	0.0924	0.0342693	2.7	0.007	0.02516	0.15964
_cons	0.08709	0.0030461	28.59	0	0.08111	0.09306

Source: 2008-2017 STATA output

The overall F-value at 41.43 evidence that the model is statistically significant at 1% level as the p-value is at 0. Adjusted R^2 at 16% indicates that the model explains 16% of the variance in the stock price volatility with the dependent variables. In addition, another significant criterion in determining the fitness of the model Root Mean Square shows 0.02. The square root of the variance of the residuals at lowest at 0.02 indicates that the data is close to the predicted values of the model.

The regression results from Table 6 shows that payout depicts a positive association with stock price volatility and the results are not statistically significant at 5%. Dividend yield shows a negative, highly significant association with share price volatility. The empirical results show that dividends affect stock prices significantly in Indian capital markets (Ho_1 is thus rejected). These results are consistent with previous studies of Baskin (1989), Nazir et.al (2010), Sadiq et.al (2013), Hussainey et.al (2011) Jecheche (2012 Hashemijoo et al (2012) Gunarathne et al (2015) Zainudin et al. (2016) Profilet and Bacon (2013) and at variance with the studies of Allen Rachim (1996), Rashid and Rahman (2008) Habib et al. (2012) Al-Shawawreh (2014) showed a positive relationship with share price volatility with no or weak statistical significance. The results imply that paying larger dividends and possibly investing less reduces risk which in turn may influence the cost of capital and hence the stock price. The higher the dividend yield the less the volatile the stock price is. A number of theoretical mechanisms also highlighted the dividend yield vary inversely with stock price. The beta statistics also suggest that it is the dividend yield which has much the greater influence on price volatility.

The findings contradict with M&M proposition of dividends irrelevance theory and align with the bird in hand theory developed by Gordon and Linter. Indian investors are keen on receiving the dividends today than waiting for capital gains due to the relatively volatile nature of the Indian capital market.

Given the control variables, the firm size has proved a significant negative association with share price volatility as anticipated. The larger the size of the firm the stock price volatility decreases due to an increase in the number of shares outstanding. As highlighted by Christie (1982) smaller firms are more sensitive to idiosyncratic shocks compared to larger firms and are prone to higher stock price volatility. Moreover, in terms of geographical locations and enterprise, larger firms are well diversified in comparison to smaller firms. The regression results achieved are persistent with the studies of Allen Rachim (1996) Habib et al. (2012) Hashemijoo et al (2012) Hussainey et.al (2011) Ramadan (2013), Rashid and Rahman (2008) and repudiate with the results of Profilet and Bacon (2013) Al-Shawawreh (2014) Gunarathne et al (2015) showed a significant positive influence on stock price volatility.

Alongside firm size, earnings volatility display a positive, significant association with share price volatility. It is easy to understand that if a company has stable profits that follows dividend smoothing, eventually results in less volatile stocks. Goncharov (2015) demonstrated a strong relationship between earnings volatility and share price volatility highlighting that investors use earnings volatility in risk assessment and the management uses earnings as a signaling device showing the firm's future prospects. Similar results were observed by Song (2012), Hooi et.al (2015) Zainudin et al. (2016) Hashemijoo et al (2012) Allen and Rachim (1996).

As an indicator of a firm's financial leverage, debt to total assets appears positively regressed with stock price volatility as presumed. The results strengthen the fact dictated by the financial theory that the greater the leverage, the increased risk and subsequent volatility in stock prices (Alaoui et.al 2017). A firm with a high leverage ratio implies that the firm relies more on debt at less cost compared to the reinvestment rate. As identified in the regression results earlier that, dividend yield associated negatively with stock price volatility indicating less reinvestment, the same results are replicated in the leverage ratio. Analogous results were conferred by Allen and Rachim (1996), positive and no significance, Hussainey et.al (2011) positive and significant and Profilet and Bacon (2013) got negative association inconsistent to the hypothesized signs.

5. Conclusion
Based on the empirical results it can be concluded that dividends are affecting stock prices variations in India and is fitted with the bird in hand and signaling theory of dividends. In contrary to M&M prepositions, dividends depict relevance in influencing the stock prices in India during the sample period. Due to the volatile nature of the market, Indian investors' prefer demanding more dividends from firms rather keeping retained earnings on

reinvestment. When firms follow dividend smoothing, which in turn acts as a signal on the prospective future performance of the company to the investors and thus create stock price variations.

There are few limitations faced by this study which provides scope for future research in this area of study. As highlighted by Baker and Wurgler (2004) dividends are highly relevant in influencing stock prices, but in different directions in different times, the derived results of this study may not be generalized with other geographical markets. Moreover, the dividend payments are not only influenced by internal factor but could also be influenced by market-specific factors which is not included in the present study.

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STRENGTHENING FINANCIAL DECENTRALIZATION: DRIVER OR RISK FACTOR FOR SUSTAINABLE SOCIO-ECONOMIC DEVELOPMENT OF TERRITORIES? [*]

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Abstract. The article deals with the problem of modeling the effectiveness of the development of financial decentralization mechanisms. A conceptual approach is proposed, which allows to form a complex of models. The models allow to evaluate the socio-economic effects of financial decentralization increase; to determine the "threshold" value of the level of financial decentralization, upon which slowdown in economic growth may occur. The models are based on based on the principal components' method, canonical correlations, cluster analysis, Kohonen neural networks, the level of development method, production and institutional functions. The modeling results showed that a high level of financial decentralization is inherent to countries with a high level of economic development, where high quality institutional environment and administrative decentralization lead to the increase of the efficiency of the public sector functioning. At the same time, in countries with a high level of competitiveness and socio-economic development the gap between the growth rates of income and expenditure powers of budgets of various levels and the growth rate of GDP is growing. This fact reduces the level of budget and debt security. Models of production and institutional functions have been developed, countries with a "reference" development model have been identified, as well as groups of countries that would have a higher effect from the re-centralization of government finances or financial decentralization.

Keywords: financial decentralization, efficiency, modeling, multidimensional analysis, production and institutional functions

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1. Introduction

The present stage of the world economy development is characterized by significant regional disparities, a high level of polarization of economic development. Thus, as of 2018, 36 countries (18% of the total number of countries) accounted for 60% of world GDP and 18% of the population. The remaining 159 countries (82%) accounted for respectively 40% of world GDP and 82% of the population (OECD, 2018). These proportions of economic development polarization are reproduced both at the level of individual countries and regions. This increases the absolute inequality. In particular, the gap in the per capita GDP levels of states with high and low levels of development increased from 74 times in 1961 to 1048 times in the pre-crisis 2008 (WORLDBANK, 2018).

The current situation forced us to talk about the imperfection of the adopted strategy of economic growth, which creates additional risks and threats, especially in conditions of cyclical crises. This is confirmed by a series of financial, economic, and social crises that permanently arose during 2008–2018. In the context of a cyclical downturn the government were forced to make cuts in social programs, which led to a sharp decline in the quality of life of individual groups of the population, the growth of social tension, strikes, crisis of social and economic situations. In particular, one of the examples of the growth of social tension in society is the "strikes of yellow vests" in France, which dealt a tangible blow to the economy by blocking transport routes, disrupting traditional supply chains, reducing sales. Economic losses from protest sentiments in France, affecting the requirements of reducing taxes on gasoline, increasing pensions, restoring the wealth tax and reducing the salaries of politicians amounted to billions of euros. The decline in the growth rate of French GDP from 2.3% in 2017 to 1.6% in 2018 was occurred due to these strikes (Viscusi & Horobin, 2018).

Protest sentiments are also typical for the group of so-called donor regions. Under the conditions of a cyclical crisis and a slowdown in economic growth, donor regions are forced to direct funds not for financial and investment support of innovatively oriented industries-catalysts of economic growth, but for subsidies, subventions, transfers to regions with a low level of development, thereby the duration of the period of economic recession is increased and a "funnel" of the economic crisis is formed. An example of such a conflict between "donors" and "recipients" is the referendum on the independence of Catalonia in 2017. Spain's economic losses were more than 1 billion euros, more than 3 thousand companies have withdrawn their representative offices outside of Catalonia (Segodnya, 2018).

It is obvious that the modern strategies of economic growth show their inconsistency, which leads to the highlighting, along with such concepts as "economic efficiency" and "social justice", the concepts of "sustainability" and "balance". Thus, in the works of Stiglitz (2013), Piketty (2014), it is noted that widening inequality in income and wealth threatens long-term prosperity and stability of a market economy. The attention of international institutions such as the World Bank, the IMF, the OECD and the WEF to the identified problems of economic growth, inequality and sustainability, has led to the formation of the concept of "inclusive economic growth". According to the OECD definition, "inclusive growth is an economic development, within which opportunities for all segments of the population arise, and material and non-material benefits in society are fairly distributed to increase their well-being" (OECD, 2018). It must be said that one of the areas of high priority for the formation of an effective economic policy of inclusive growth, along with the transformation of security systems, education, advanced training, promotion of effective employment in the labor market, etc., is the formation of a new fiscal systems architecture. Therefore, the focus of current economic research are such concepts as "models of fiscal federalism" and "efficiency of financial decentralization mechanisms".

2. Literature review and the problem statement

It is necessary to note that in modern economic literature (Aldasoro & Seiferling, 2014; Bartolini at al., 2016; Baskaran at al., 2016; Brumnik at al., 2014; Peshina & Strekalova, 2016; Sasongko et al., 2019), the concept of "fiscal federalism" is considered simultaneously with such concepts as "financial decentralization", "leveling federalism", "fiscal decentralization". However, this division is rather arbitrary and is mainly due to regional interpretations. The generally accepted and universal interpretation of the system of transfers (subsidies) through which the federal government shares its revenues with the governments of territorial-administrative units (states, cantons, etc.) and local authorities, based on optimizing the size and number of local administrations, the separation of powers to collect taxes and expenses between different levels of government are equivalent to the concept of "fiscal federalism". Therefore, in this paper, the concepts of "fiscal federalism", "financial decentralization" are considered as synonymous terms. There are the following main characteristics of "fiscal federalism": the components of fiscal federalism emphasize: multi-level management; different levels of administration; multi-level government; in the focus of fiscal federalism, the following are distinguished: effective provision of public services and an increase in the well-being of the population at decentralization levels; mutual restrictions on the intervention of management levels in the functioning of the economy, economic decisions.

Thus, fiscal federalism is the architecture of a financial mechanism that ensures the coordinated and balanced development of the revenue and expenditure budgets of various levels of hierarchy in the system of government in accordance with the competencies assigned to these levels to improve the quality of life of the population and a balanced socio-economic development of regions and states in general, within the framework of the national development strategy and priorities supported by the population.

Analysis of the financial decentralization mechanisms development allowed to identify two of its basic vectors: 1) reducing vertical gaps and ensuring the balance of revenue and expenditure powers of budgets of various levels, autonomization of budgets, expanding sources of formation of the revenue base of local budgets; 2) development of leveling federalism, streamlining and enhancing the consistency of intergovernmental agreements. The first development vector is preferable mainly for countries with middle level of socio-economic development and competitiveness, such as Spain and Italy. The second vector of development is supported mainly by countries with a high level of socio-economic development and competitiveness, in particular, Germany and Sweden.

Regardless of the concept of financial decentralization adopted in various EU countries, its results ambiguously influence the socio-economic development of both individual regions and the country as a whole. So, experts note both positive and negative effects of financial decentralization. The positive effects include the following: reducing the time taken to make decisions on the strategies for the socio-economic development of regions that meet the expectations of society; openness and transparency of decision-making procedures; increasing initiative and decision-making responsibility, the possibility of quickly leveling the impact of "shocks" on the regional economy in the context of increasing globalization and openness of the economy. The set of negative effects includes consists of: autonomization and confrontation of the goals of the socio-economic development of individual territorial entities and the state as a whole; disintegration of activities related to the provision of public services; coordination difficulties, etc.

The foregoing raises the need to model the effectiveness of the development of financial decentralization mechanisms in the EU countries in order to form adequate financial federalism mechanisms ensuring sustainable development both for individual regions and for the country as a whole.

The problem of evaluating the effectiveness of the development of financial decentralization mechanisms is researched in works of such authors as Aldasoro & Seiferling M. (2014), Asatryan & Feld (2014), Bartolini at al.

(2016), Baskaran at al. (2016), Bloch (2016), Hughes & Smith (1991), Oates (2008), Tanzi (2007), Weingast (2007), Brumnik R. at al. (2014), Guryanova at al. (2015), Peshina & Strekalova (2016), Volohova (2016) at al. Thus, Aldasoro & Seiferling (2014) discusses the impact of vertical fiscal imbalances on the level of debt security. The researchs of Bloch (2016), Hughes & Smith (1991), Oates (2008), Tanzi (2007), Weingast (2007), Peshina & Strekalova (2016), Idrisova (2016) are devoted to the analysis of trends in the development of mechanisms for financial decentralization, the formation of the topological characteristics of financial decentralization models. Authors Asatryan & Feld (2014), Bartolini at al. (2016), Baskaran at al. (2016), Stossberg & Blöchliger (2017), Fabus (2018) research the issues of modeling the impact of the level of financial decentralization on the rate of economic growth and uneven regional development. Various aspects of modeling the production, fiscal and social effects of fiscal policy at various levels of management are discussed by Guryanova at al. (2015), Brumnik at al. (2014), Baltgailis (2019).

Emphasizing the unconditional efficiency of the approaches proposed by the authors, we note that those works do not fully investigate the issues of building an integrated assessment of the level of financial decentralization and analyzing its impact on the rates of socio-economic development of countries with developing economies, choosing a "reference" model of developing financial decentralization that take into account the level of competitiveness and socio-economic development of territories.

The main aim of the research is to form a set of models for evaluating the effectiveness of financial decentralization mechanisms. The models are based on the principal component's method, canonical correlations, cluster analysis, Kohonen neural networks, the level of development method, production and institutional functions. The models allow to evaluate the socio-economic effects of financial decentralization increase; to determine the "threshold" value of the level of financial decentralization, upon which slowdown in economic growth may occur.

3. Conceptual research scheme

The proposed conceptual scheme of the research (see Table 1) includes the following modules: *module 1*: grouping countries by the level of competitiveness and socio-economic development, the formation of a comparable research base; *module 2*: formation of a system of indicators and diagnostic classes of the level of financial decentralization; *module 3*: developing models for integrated assessment of the level of financial decentralization; *module 4*: development of models of production and institutional functions.

Table 1. **The main modules of the conceptual research scheme**

The modules title and contents	*Research methods*	*Models*
Module 1. Grouping countries by the level of competitiveness and socio-economic development, the formation of a comparable research base 1.1. Rationale for the indicator system 1.2. Development of classifications 1.3. Classification quality assessment 1.4. Evaluation of the propensity of elements to migrate from cluster to cluster 1.5. Formation of a comparable base of research	principal component method; canonical correlations; hierarchical agglomerative methods; iterative methods; Kohonen's neural network models	Model 1 - country classification model by socio-economic development and competitiveness
Module 2. Formation of a system of indicators and diagnostic classes of the level of financial decentralization 2.1. Rationale for the system of indicators of the financial decentralization development level 2.2. Grouping of macroregions according to the level of financial decentralization development 2.3. Analysis of the diagnostic characteristics of macroregions groups	principal component method; canonical correlations; hierarchical agglomerative methods; iterative methods; two-way joining	Model 2 - model of the formation of diagnostic classes of the financial decentralization level
Module 3. Developing models for integrated assessment of the level of	methods for	Model 3 –model of the complex

financial decentralization 3.1. Standardization of the system of indicators of the financial decentralization development level 3.2. Determining the coordinates of the reference object 3.3. Formation of a system of integrate (complex and local) indicators of the level of development of financial decentralization 3.4. Assessment of convergence of development of the level of financial decentralization in macroregions	constructing a reference object; convergence analysis methods	assessment of the level of development of financial decentralization
Module 4. Development of models of production and institutional functions. 4.1. Building a model of production and institutional functions 4.2. Definition of the financial decentralization "threshold" level	development level method; production and institutional functions	Model 4 - model of production and institutional functions

Source: developed by the authors

The detailed description of the modules presented in the Table 1, is given below.

The level of financial decentralization and the level of socio-economic development are categories that are characterized by a two-way causal relationship. Thus, the level of financial decentralization depends on the level of economic development, the scale of the territory, the degree of homogeneity of the economic space. At the same time, the effectiveness of financial decentralization largely determines the rate of economic growth and the quality of life of the population in the regions. Therefore, the target orientation of the first module is the formation of a comparable base of the relationship research between the level of financial decentralization and the rate of socio-economic development. In the first module, the following tasks are accomplished: task 1.1 - assessment of informativeness and formation of a system of indicators of socio-economic development and competitiveness of territories; task 1.2 - grouping countries by level of socio-economic development and competitiveness.

To solve task 1.1, various methods can be used: methods based on autoinformative criteria; methods focused on the assessment of informativeness based on the analysis of cause-effect relationships (Geetz at al., 2006; Kizim at al., 2007; Guryanova at al., 2017). The first group of methods makes it possible to evaluate the informational significance of indicators, to reveal hidden properties and patterns in large volumes of raw data, in the case when the structure of the input and output data is unknown. The advantage of the second group of methods is the possibility of reducing the dimensionality of the information space of indicators based on the analysis of causal relationships of the set of input and output indicators. The choice of method is determined by the complete or incomplete provision of information, the sample size, the structure of the set of input and output indicators, the presence of a training sample. The scheme of the filter for indicator system is developed based on restrictions on data type and structure of indicator groups. The detailed description of the scheme is given in the work of Guryanova (2013). The proposed approach is based on the methods of canonical analysis and the principal components.

Principal components f_i are linear orthogonal combinations of basic indicators of socio-economic development and competitiveness of countries: $f_i = \sum_{j=1}^{m} b_{ij}x_j$, $\sum_{j=1}^{m} b_{ij}^2 = 1$, $\sum_{i=1}^{m} b_{ij}b_{ik} = 0$, $j \neq k$. The formation of a system of principal components is reduced to a step-by-step transformation of the initial matrix, which can be represented as follows: $X \rightarrow R \rightarrow \lambda, U \rightarrow V \rightarrow A \rightarrow F$, where X - initial data matrix, x_j − the j-th indicator of socio-economic development and competitiveness of countries , m − number of principal components, b_{ij} - loadings of the i-th principal component, R - pair correlation matrix, λ, U - eigenvalues and eigenvector matrix, V - matrix of normalized values of eigenvectors, A - factor mapping matrix, F- principal components matrix. Analysis of the elements of the factor maping matrix $A = (a_{jr})$ allows to form the following subsets: φ_1 - subset of insignificant indicators; φ_2 - subset of significant indicators (as a rule, this set includes indicators, whose factor loadings satisfy the condition $a_{jr} \geq 0,7)$; φ_3 - a subset of significant indicators that are not involved in the formation of the principal components; φ_4 - a subset of significant indicators that are involved in the formation of

the principal components (a set of informative, "diagnostic" indicators). The first level of the filter of the initial system of indicators is based on the selection of a subset φ_4. It is considered informative if the following condition is true: $K_r = \frac{\sum_{j=1}^{n} a_{jr}^2 \{\varphi_2 - \varphi_8 = \varphi_4\}}{\sum_{j=1}^{n} a_{jr}^2} \geq 0.75, r = \overline{1,k}$ Thus, the choice of the principal components method is explained by the possibility of forming a system of generalized latent factors, determining the most informative indicators.

The second level of the filter is based on the analysis of the relationship between indicators of social (X_3) and economic (X_4) development (as a higher level subsystem) of territories using the method of canonical correlations. The canonical correlation is the correlation between canonical variables $U = \sum_{j=1}^{m_1} a_j x_{3j}$ and $V = \sum_{j=1}^{m_2} b_j x_{4j}$. The formation of a system of canonical variables can be represented by the following scheme: $X_3, X_4 \rightarrow R_{33}, R_{34}, R_{43}, R_{44} \rightarrow C \rightarrow \lambda, B \rightarrow A$, where X_3, X_4 - matrices of input data of dimension nm_1 and nm_2, n − number of observations, $R_{33}, R_{34}, R_{43}, R_{44}$ - pair correlation matrices, $C = R_{44}^{-1}, R_{43}, R_{33}^{-1}, R_{34}$, λ, B - eigenvalues and eigenvector matrix, A - coefficient matrix for factor variables in the system of canonical correlations. The matrix of pairwise correlations is divided into four parts: $R = \begin{pmatrix} R_{33} & R_{34} \\ R_{43} & R_{44} \end{pmatrix}$. On its basis, auxiliary matrices are determined $R_{44}^{-1}, R_{33}^{-1}, C = R_{44}^{-1}, R_{43}, R_{33}^{-1}, R_{34}$. Next, the eigenvalues of the matrix C and the corresponding basis of the eigenvectors $B_1, B_2, ..., B_p$ are calculated. The coefficients of the factor variables in the system of canonical correlations are calculated by the formula: $A_i = \frac{R_{33}^{-1} R_{34} B_j}{\lambda_j}$. If you rank the eigenvalues in descending order $\lambda_1, \lambda_2, ..., \lambda_p$, then the maximum canonical correlation coefficient will correspond to λ_1^2.

In the process of canonical analysis, the initial data is reduced to a standardized form; therefore, the coefficients in the expressions for the canonical variables characterize the strength of the effect of the corresponding initial indicators, which makes it possible to obtain their ranked sequences. Non-essential indicators are eliminated on the basis of a multi-step procedure, in which at each step only one variable is discarded, the least significant in this sequence. To compare the canonical correlations, the Fisher z-transformation is used.

Thus, the method of canonical correlations makes it possible to analyze the relationship between several output indicators and a large number of factors. This property is important in the justification of indicators, since the dynamics of the subsystems of social and economic development of territories is characterized by a large set of features. The choice of one of the most significant indicator will lead to a distortion of the assessment results.

To solve task 1.2 - grouping countries by level of socio-economic development and competitiveness, the methods of cluster analysis (classification methods without training) and Kohonen self-organizing maps are used.

Classification consists in splitting the initial set of objects into a relatively small number of classes $Q = \{Q_1, Q_2, ..., Q_i\}$ so that objects belonging to the same class (group) are located at relatively small distances from each other. The similarity or difference between the classified objects is established depending on the metric distance between them. For building the group, hierarchical agglomerative and iterative methods were used. Hierarchical agglomerative methods provide only a conditionally optimal solution in a certain subset of local partitions (clusters). However, the advantage of these methods is the ease of interpretation of the results. The results of clustering, presented in the form of a dendrogram, allow choosing the number of clusters at which the total intergroup dispersion will take the maximum value. This number of clusters is used to select the initial conditions of the iterative algorithm of the k-means method, a detailed description of which is given in the work of Geetz at al. (2006).

As an alternative approach of grouping, models of the Kohonen neural network were considered. We used both complex (across the entire set of indicators) and local diagnostics (for individual groups of indicators), investigated the stability of cluster formations, determined the probability of moving objects from cluster to cluster, taking into account the dynamic characteristics of socio-economic development and competitiveness (Guryanova at al., 2018).

At the end of the classification procedures it is necessary to evaluate the obtained results. For this purpose, a certain measure of the quality of classification is used, the so-called quality functional. The best for the selected functional should be considered such partition, at which the minimum value of the objective function - the quality functional - is reached. When analyzing partitions, the following quality functionals were considered: $F_1 = \sum_{l=1}^{k} \sum_{i \in S_l} d^2(x_i, \bar{x}_l), F_2 = \sum_{l=1}^{k} \sum_{i \in S_l} d_{ij}^2, \ F_3 = \sum_{l=1}^{k} \sum_{j=1}^{p} \sigma_{lj}^2, \ k$ –number of clusters; S_l - set of elements which form the l-th cluster; $d^2(x_i, \bar{x}_l)$ – distance between the i-th element and the cluster centroid; d_{ij}^2 – distance between the i-th and the j-th elements; p – number of variables used in clustering; σ_{lj}^2 – dispersion of the j-th variable in the l-th cluster.
. A partition is considered optimal when $F_i \rightarrow \min(S \in A)$, where A - the set of all admissible partitions.

In the second module, the formation of a system of indicators of research and diagnostic classes of the level of financial decentralization is carried out. The construction of a system of diagnostic indicators of the level of financial decentralization was carried out in accordance with the block diagram of the indicator system filter described above. When forming diagnostic classes of the level of financial decentralization, standardized values of the following indicators were used: financial decentralization by expenditure, financial decentralization by income, indicators of the level of economic development and homogeneity of the economic space, indicators of territorial scale. To build diagnostic classes, hierarchical agglomerative (Ward's method) and iterative (k-means method) cluster analysis procedures were used, as well as the two-way join method, that is described in detail in the work of Kizim at al. (2007).

The content of the third module is a comprehensive assessment of the financial decentralization level. The need to build a system of complex (across the entire system of indicators) and local (for individual components) integral assessments of the level of financial decentralization is caused by the different direction of changes in indicators. This fact complicates the analysis and requires to represent the initial indicator set in the form of a synthetic assessment, which is the result of a convolution of indicators that describe the development of individual subsystems.

The block diagram of an algorithmic model for the formation of an integral assessment of the level of financial decentralization is based on one of the methods for constructing a reference object - a taxonomic indicator of the development level (Geetz at al., 2006). The indicator of the development level is calculated as follows: $d_i^* = 1 - \frac{c_{i0}}{c_0}, \ c_0 = \bar{c}_0 + 2S_0, \bar{c}_0 = \frac{1}{n} \sum_{i=1}^{n} c_{i0}, S_0 = \frac{1}{n} \sqrt{\sum_{i=1}^{n}(c_{i0} - \bar{c}_0)^2}, \ c_{i0} = \sqrt{\sum_{j=1}^{m}(Z_{ij} - Z_{0j})^2}$. To construct the pattern, the initial indicator set must be divided into stimulants and disstimulants. Those indicators that have a positive, stimulating effect on the level of financial decentralization are called stimulants, as opposed to disstimulants. The procedure for grouping indicators from the diagnostic set φ4 into stimulants and disstimulants is based on expert assessment. The coordinates of the pattern are determined as follows: $z_{0j} = \begin{cases} \max_i z_{ij}, if \ j \in I \\ \min_i z_{ij}, \ if \ j \notin I \end{cases}$,

where I – stimulants set. Because of different dimensions of initial indicators, the distance matrix is calculated on

the basis of the standardized values: $z_{ij} = \frac{x_{ij} - \overline{x_j}}{s_j}$. The values of the final integral indicator vary in the range from 0 to 1. The closer the values of the integral indicator to 1, the higher the level of financial decentralization.

The purpose of the fourth module is to build a model of production and institutional functions. The model allows you to determine the "threshold" level of financial decentralization, the excess of which will lead to a slowdown in economic growth. The industrial and institutional functions are sufficiently effective tool for studying the impact of the development of financial mechanisms of decentralization on economic growth. They are widely used in modeling production and fiscal effects (Klebanova et al., 2013). A general model specification can be represented as follows:

$$Y = \gamma \cdot D \cdot K^{q \cdot (a + b \cdot q)} L^{q \cdot (n + m \cdot q)},$$

where Y – output (GDP), $D = e^{\beta t}$ – trend operator, t – time period, K – capital, L – number of employees, β, γ, a, b, m, n – model parameters, q – tax burden parameter.

The output elasticity is determined by the non-linear function of the tax burden for each production factor. This reflects the possibility of strengthening or weakening the influence of factors in different states of the institutional environment.

Parameters of production and institutional functions are estimated based on the linearization of the model (transforming the nonlinear model to a linear form):

$$lnY = ln\gamma + \beta \cdot t + a \cdot q \cdot lnK + b \cdot q^2 \cdot lnK + n \cdot q \cdot lnK + m \cdot q^2 \cdot lnL,$$

let's denote:

$$z_1^* = lnY, a_0 = ln\gamma, z_2^* = q \cdot lnK, z_3^* = q^2 \cdot lnK, z_4^* = q \cdot lnL, z_5^* = q^2 \cdot lnL$$

By substitution, we obtain a linear view of the model, the parameters of which are estimated according to statistical procedures:

$$z_1^* = a_0 + \beta \cdot t + a \cdot z_2^* + b \cdot z_3^* + n \cdot z_4^* + m \cdot z_5^*.$$

In general, the estimation of the model parameters makes it possible to study the extremum points of the function. This curve reaches a local maximum at the point q*, for which the following conditions are satisfied:

$$\frac{\partial Y(q^*)}{\partial q} = 0; \frac{\partial^2 Y(q^*)}{\partial q} < 0$$

When analyzing the effectiveness of the development of financial decentralization mechanisms, it is proposed to consider the integral indicator of the level of development of fiscal decentralization as an assessment of the institutional factor. The proposed specification of the model is: $Y = \gamma \cdot D \cdot K^{cv \cdot (a + b \cdot cv)} L^{cv \cdot (n + m \cdot cv)}$, where Y – output (GDP); $D = e^{\beta t}$ – trend; t – time period; K – Investments in fixed assets; L – number of employees; β, γ, a, b, m, n – model parameters; cv – integral indicator of the level of development of the mechanism of financial decentralization.

It is necessary to note that the impact of production resources may be increased or decreased depending on the level of financial decentralization. So, some countries are already decentralized more than they need and would get more effect from re-centralization. This is due to the strong impact of "shocks" on individual regions in the context of growing globalization and openness of the economy, the need for financial assistance to such regions;

growth of uneven regional development, heterogeneous potential of adaptation of regional systems to unstable conditions of functioning. Increasing instability also leads to the increase of social spendings level (pensions, social security, unemployment benefits, retraining, etc.), and, as a result, given the high level of tax autonomy and decentralization, to an increase in the budget deficit and public debt. In addition, in some cases, decentralized countries can have a greater effect from the re-centralization of the health and education system, economies of scale and effective coordination of resource allocation.

Other countries are excessively centralized and have a low level of tax autonomy, which causes imbalances in the fiscal system at different management levels. The development of financial decentralization would increase the productivity of resources and overall economic efficiency, as subnational authorities can increase the efficiency of the public services sector due to their proximity to the population and greater awareness of the needs and problems of the respective territories. In other words, investments made by subnational governments are more efficient and more conducive to economic growth than those ones made by central government. In addition, in the conditions of mobility of labor and financial capital, the application of a competitive development model for the subnational level is an incentive for local authorities to improve the quality of life of the population and create favorable conditions for doing business in the region.

Thus, the implementation of the proposed conceptual approach to building a set of models for evaluating the effectiveness of financial decentralization makes it possible to form diagnostic classes of financial decentralization; to determine the "threshold" value of the level of financial decentralization, the excess of which will slowdown the economic growth; identify groups of macroregions that will have a higher effect from the development of financial decentralization or re-centralization of public finances.

4. Results and analysis

The implementation of the first module of the proposed conceptual approach was carried out on the indicators of socio-economic development and competitiveness of more than 100 objects (macro-regions). For the implementation of the models the following programs were used: Statistica, R, Deductor Studio (Guryanova at al., 2018). The initial system of indicators was formed on the basis of the analysis of literary sources devoted to the problem of assessing the level of socio-economic development and competitiveness of territories. The selected indicators are included in the "core" of the indicator systems, occurring in more than 60% of the researched cases. Such indicator system includes both quantitative indicators (GDP per capita, unemployment rate, per capita consumption, inflation) and qualitative indicators (Global competitiveness index (GCI), Global innovation index (GII), Human development index (HDI), ICT development index (ICTDI), Index of economic freedom (IoEF)). The information base of the research has been generated from the World Bank's website (http://data.worldbank.org), World Economic Forum website (http://reports.weforum.org/), Global Innovation Index website (https://www.globalinnovationindex.org/), United Nations Development program website (http://hdr.undp.org/en/content/human-development-index-hdi), ICT Development index (https://www.itu.int/net4/ITU-D/idi/), Index of economic freedom website (https://www.heritage.org/index/explore?view=by-region-country-year). Data for 108 macro regions was considered for the period 2014-2018. The source dataset included 3888 items.

The Fig.1 represents the results of the macro-regions grouping by the level of socio-economic development and competitiveness based on hierarchical agglomerative cluster analysis methods (Ward method) (Fig. 1a) and Kohonen self-organizing maps (Fig. 1b). The optimal number of clusters was determined according to GAP statistics, the "elbow" method, the silhouette method. The results showed that it is optimal to split the original population into three clusters.

a)   b)
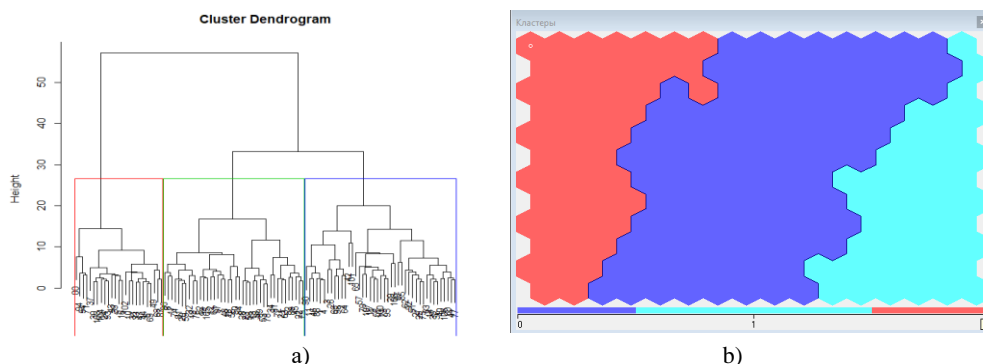
Fig. 1. The results of the macro-regions grouping by the level of socio-economic development and competitiveness based on hierarchical agglomerative cluster analysis methods (Ward method) and Kohonen self-organizing maps.

Source: developed by the authors

The initial set of objects is divided into three classes according to the level of socio-economic development and competitiveness: a cluster of macro-regions with high, medium, low levels of socio-economic development (SED). The analysis of the obtained results has shown that cluster of objects with a low level of socio-economic development consists of 37 macroregions (34% of the total), the medium level cluster has 46 macroregions (43%), the last 25 macroregions are included into the high level cluster (23%). The analysis of the cluster composition showed that 27 of the 28 countries of the European Union belong to clusters with high and medium levels of SED and competitiveness in the global coordinate system. The exception is Romania, which belongs to a cluster of countries with a low level of socio-economic development. Ukraine is included in the same cluster. However, a comparison of classification results based on the Ward method and Kohonen's self-organizing networks makes it possible to say that Ukraine belongs to the group of macroregions that are prone to migration to a medium cluster.

This cluster includes such Eastern Europe countries as Poland, Slovakia, Slovenia, etc. The Czech Republic, Estonia, Italy, and Malta are inclined to move to a higher cluster - a cluster of regions with a high level of socio-economic development.

Thus, the EU countries are mainly in the group of macro-regions with high and medium levels of SED and competitiveness. Ukraine is a macro-region prone to migration from a low level group to a medium level group. The above facts allow to make a conclusion about a fairly high level of comparability of data sets for Ukraine and EU countries when investigating trends in the development of financial decentralization mechanisms.

In the second module, the system of indicators and diagnostic classes of the level of financial decentralization was applied. The initial system of indicators was formed on the basis of the analysis of literary sources. Taking into account the information availability of data series and their methodological continuity in open databases, the final indicator system includes the following groups of markers: indicators of the level of development of the public sector ($x1$ - the percentage of state budget expenditures in GDP (%), $x2$ - the percentage of state budget revenues in GDP (%)); indicators of decentralization by expenditures ($x3$ - the percentage of local budget expenditures in total expenditures (%), $x4$ - the percentage of expenditures of local budgets in GDP (%)); $x4$ - the percentage of local budget expenditures in GDP (%)); indicators of leveling federalism ($x5$ - the percentage of transfers in regional incomes (%); $x6$ - the percentage of transfers in regional expenditures (%)); income decentralization indicators ($x7$ - the share of local budget revenues in total revenues (%); $x8$ - the share of local budget revenues in GDP (%)); indicators of fiscal federalism ($x9$ - the proportion of tax revenues in local budget revenues (%); $x10$ - the proportion of tax revenues to local budgets in total tax revenues (%)); indicators of the level of economic development and homogeneity of the economic space ($x11$ - GDP per capita (euro), $x12$ –economic density (euro

/ km^2)); indicators of scale (x13 - area (km2), x14- population (thous. people)). To form diagnostic classes of the level of financial decentralization, standardized values of indicators of financial decentralization by expenditure, financial decentralization by income, indicators of the level of economic development and homogeneity of the economic space, indicators of territorial scale were used. The hierarchical agglomerative (Ward's method) and iterative (k-means method) cluster analysis procedures, as well as two-input combination method were applied.

The grouping procedure was carried out on the data series that describe 22 macro regions of the EU for the period 2005-2016. The initial data array included 2816 elements. The resulting classification dendrogram is shown in Fig. 2.
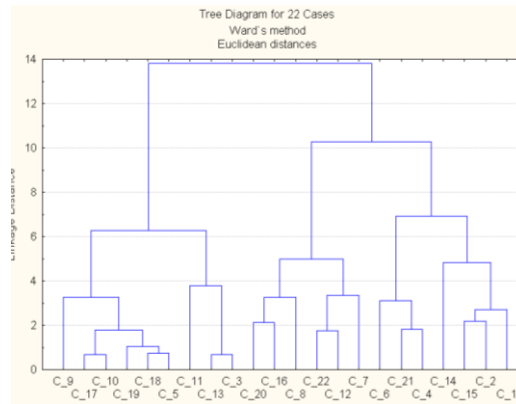
Fig. 2. Classification of European Union countries by the level of financial decentralization
Source: developed by the authors

As can be seen from fig. 2, the initial set should be divided into two clusters, the composition of which was determined using the "k-means" method. The average values of the variables in each cluster are presented in Fig. 3
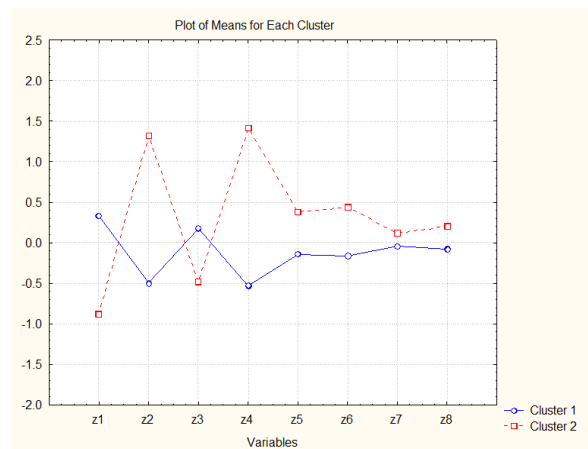
Fig. 3. The average values of the variables in each cluster

* Legend: z1 - the percentage of state budget expenditures in GDP (%), z2 - the percentage of local budget expenditures in GDP (%), z3 - the percentage of state budget revenues in GDP (%); z4 - the percentage of local budget expenditures in GDP (%); z5 - per capita GDP (euro), z6 - area (km2), z7 - economic density (euro / km2); z8 - population (thousand people).
Source: developed by the authors

According to the Fig. 3 the macroregions that formed the first cluster are characterized by a higher level of expenditures and revenues of the state budget in GDP compared to macroregions from the second cluster, low autonomy of bottom levels of the budget system, low economic development, low economic density, smaller scale and population. Thus, this cluster consists of macroregions with a low level of financial decentralization. The second cluster is characterized by a high level of regional independence from the center and minimization of redistributive processes in the fiscal system, a higher level of economic development. The results of the classification show that a higher level of decentralization is observed in countries with a high level of development, economic density, area and population.

The classification results on the basis of a two-way join (Fig. 4) also confirm rather strong differentiation in terms of decentralization by income and expenditure, the level of economic development. Clusters are less homogeneous in terms of area and population.
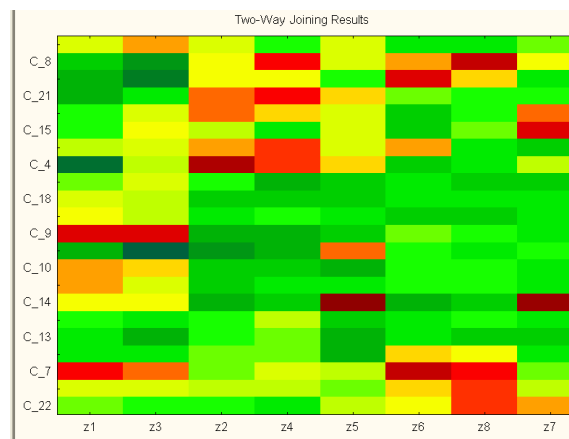
Fig. 4. The two-way join classification results
Source: developed by the authors

Thus, based on the obtained results, it can be concluded that a high level of financial decentralization is shown by the countries with a high level of economic development, where there is a high quality of political institutions and a high level of administrative decentralization, which leads to an increase in the efficiency of the public sector and, as a result, economic growth.

The third module deals with integral assessment of the level of financial decentralization. The initial data series describe more than 20 EU countries for time period 2005-2016. The source array included 2816 elements. Income decentralization indicators, expenditure decentralization indicators, indicators of leveling (budgetary) federalism and tax autonomy were taken into account. The values of the integral indicator of the financial decentralization level (cv_i) are presented in the Table 2.

Table 2. The values of the financial decentralization integral indicator (fragment)

№	Country	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
1	Austria	0.35	0.35	0.35	0.35	0.33	0.33	0.26	0.27	0.26	0.28	0.27	0.34
2	Belgium	0.49	0.49	0.49	0.48	0.48	0.46	0.35	0.35	0.34	0.36	0.35	0.53
3	Czech Republic	0.24	0.24	0.24	0.23	0.19	0.18	0.21	0.21	0.22	0.23	0.23	0.26
4	Denmark	0.57	0.55	0.54	0.53	0.53	0.52	0.40	0.43	0.40	0.44	0.43	0.54
5	Estonia	0.17	0.16	0.16	0.17	0.13	0.13	0.10	0.10	0.09	0.11	0.11	0.17

6	Finland	0.68	0.68	0.67	0.66	0.64	0.62	0.62	0.62	0.59	0.61	0.61	0.63
7	France	0.39	0.39	0.40	0.40	0.40	0.37	0.40	0.40	0.39	0.43	0.41	0.41
8	Germany	0.64	0.64	0.65	0.65	0.62	0.61	0.62	0.64	0.62	0.67	0.65	0.70
9	Greece	0.03	0.06	0.06	0.06	0.12	0.11	0.20	0.20	0.21	0.22	0.22	0.13
18	Slovakia	0.20	0.19	0.18	0.17	0.18	0.18	0.16	0.16	0.16	0.16	0.14	0.17
19	Slovenia	0.32	0.32	0.33	0.34	0.34	0.35	0.45	0.46	0.45	0.46	0.44	0.33
20	Spain	0.56	0.57	0.58	0.57	0.55	0.57	0.45	0.44	0.42	0.47	0.46	0.58
21	Sweden	0.83	0.83	0.84	0.85	0.82	0.80	0.86	0.87	0.85	0.90	0.89	0.85
22	Great Britain	0.32	0.32	0.32	0.31	0.30	0.30	0.27	0.26	0.25	0.27	0.27	0.29

Source: developed by the authors

The table shows a significant heterogeneity of the EU countries in terms of financial decentralization. The maximum value of the financial decentralization level is observed in Sweden (0.85). The minimum value is observed in Greece (0.13). The coefficient of variation of the financial decentralization level is 50%, which reflects significant variations in data set. Similarly, local integral indicators of income decentralization, expenditure decentralization, budgetary federalism and tax autonomy were found (cv_{1i}, cv_{2i}, cv_{3i}, cv_{4i}). The coefficients of variation for the indicators v_{1i}, cv_{2i}, cv_{3i}, cv_{4i} are respectively 19,69%; 23,8%; 10,34%; 21,38%. In terms of the level of development of budgetary federalism, the sample is homogeneous. The most significant differences are observed in the indicators of the level of financial decentralization of income and tax autonomy. Among all EU countries, the Czech Republic, Spain, Italy, and Sweden are the closest ones to the coordinates of the "pattern point".

The above values of the integral indicator were used to build a model of the production-institutional function (the fourth module of the conceptual approach). It should be noted that the previously presented model of production and institutional functions can be developed using spatial, dynamic or panel data. The paper presents a spatial model which has the most accurate approximation level. The resulting model is: $Y = exp^{16.72962} K^{cv(0.5156+2.6142 \cdot cv)} L^{cv(1.0203-4.0936 \cdot cv)}$. Student criterion value equal to t_y=21.29, t_a= 2.41, t_b= 3.29, t_m= 9.15, t_n=-3.67 This allows us to conclude that the model parameters are statistically significant with a 93-99% confidence level. The value of the coefficient of determination, correlation index, Fisher criteria are the following R^2 =0.92, R=0.96, F =48.96. They indicate the statistical significance of the model as a whole. Thus, the model can be used for further analysis.

The "threshold" values of the level of financial decentralization found on the basis of the model suggest that EU countries have significant potential for economic growth due to the development of financial decentralization mechanisms. In particular, for a number of Eastern European countries the level of financial decentralization is significantly lower than optimal. It should be noted that the above approach is quite universal and can be used to assess the effectiveness of sectoral decentralization.

5. Conclusions

Thus, the conceptual approach to the formation of a set of models for assessing the effectiveness of the development of financial decentralization mechanisms was proposed. The approach includes the following modules: classification of countries by level of socio-economic development and competitiveness, the formation of a comparable research base; formation of a system of indicators and diagnostic classes of the financial decentralization level; development of integrated assessment models for the financial decentralization level; development of models of production and institutional functions.

The modeling results showed that a high level of financial decentralization is peculiar to countries with a high level of economic development, in which there is a high-quality institutional environment and administrative decentralization. These factors are the core drivers of efficiency increase in the public sector and, consequently, of economic growth. At the same time, there is a gap between the growth rates of income and expenditure powers of budgets of various levels and GDP growth rates for countries with a high level of competitiveness and socio-economic development, which reduces the level of budget and debt security.

The simulation results led to the conclusion that there is a significant heterogeneity of the EU countries in terms of the level of development of financial decentralization. The coefficient of variation of the financial decentralization complex indicator is about 50%. The data sample is homogeneous in terms of leveling (budgetary) federalism indicator. It indicates a low differentiation of indicators of social policy between the EU countries. The most significant differences are observed in the indicators of the financial decentralization of income and tax autonomy. Among all EU countries, the Czech Republic, Spain, Italy, and Sweden are the closest ones to the coordinates of the "pattern point".

The developed models of production and institutional functions make it possible to determine the "threshold" value of the level of financial decentralization, the excess of which will lead to a slowdown in economic growth. The groups of countries have been determined that will have a higher effect from the development of financial decentralization or re-centralization of public finances. The proposed approach is quite universal and can be used to assess the effectiveness of sectoral decentralization.

Acknowledgements

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CORPORATE SOCIAL RESPONSIBILITY DISCLOSURE: EVIDENCE FROM THE EUROPEAN RETAIL SECTOR

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Abstract. The article provides an up-to-date description of practices in the field of corporate social responsibility disclosures among European retailers. Reports registered by the Global Reporting Initiative's Sustainability Disclosure Database and corresponding to the following parameters have been used for the study: sector – retailers; region – Europe; report type – GRI G1, GRI G2, GRI G3, GRI G3.1, GRI G4, GRI Standards. The author has calculated general and specific Corporate Social Responsibility Disclosure Indexes, and has analyzed individual elements of general, economic, environmental and social disclosures. The results confirm the spread of corporate social responsibility disclosures; a linear increase in the number of sustainability reports by European retailers is observed. The typical environmental disclosures for retailers are related to energy consumption, carbon dioxide emissions, and waste. Among the social disclosures, the most popular are the "New employee hires and employee turnover", as well as those associated with hazard identification, risk assessment, and incident investigation in the context of occupational health and safety, and the impact of goods and services on the health and safety of consumers. Disclosures related to water consumption, protected areas and IUCN Red List species, certain aspects of occupational health and safety (such as worker training, promotion of worker health, work-related injuries and ill health, etc.) and indigenous peoples' rights were less common among the European retailers. The results may be useful for retailers who are beginning to create sustainability reports, including in terms of examples of best practices and industry-specific features of retail corporate social responsibility.

Keywords: corporate social responsibility; sustainability report; Global Reporting Initiative; retail; Europe

1. Introduction

Companies in both developed and developing countries are increasing their corporate social responsibility disclosures (Dias et al. 2016). The agenda of corporate social responsibility disclosures depends on several factors, including industry and country (Hackston, Milne 1996; Ali et al. 2017).

Industry, along with size, is the most frequently considered characteristic of a company which affects corporate social responsibility disclosures (Ali et al. 2017). Gray et al. (1995) have concluded that the industry appears to affect corporate social responsibility disclosure, but further research is needed to determine the immediate effect. The relationship between industry and social or environmental disclosures has been established by Patten (1991), Roberts (1992), and Kansal et al. (2014). For example, companies in the sphere of natural resource extraction or hazardous industries pay more attention to environmental disclosures. Companies interacting with end users tend to focus more on local communities. Differences in the corporate social responsibility disclosures of enterprises in specific industries are confirmed by specialized research in the sphere of the building and construction industry (Evangelinos et al. 2016), and insurance (Ullah et al. 2019), etc.

There are numerous studies devoted to the specific features of corporate social responsibility disclosures in individual countries around the world. Some of them focus on developing countries: Indonesia and Malaysia (Gantyowati 2017), Pakistan (Ali, Frynas 2017), India (Kansal et al. 2014; Kumar, Kidwai 2018), Bangladesh (Belal 2001), Vietnam (Vu, Buranatrakul 2018), Thailand (Chongruksut 2015), and Egypt (Hussainey et al. 2011). Arrive and Feng (2018) assess disclosure practices in BRICS countries. Hu et al. (2018) examine the relationship between ownership type and corporate social responsibility disclosure in China. Hackston and Milne (1996) provide a description of corporate social responsibility disclosure practices in New Zealand. Tran (2017) discusses the differences in corporate social responsibility disclosure between Japan and the USA. A significant number of studies is devoted to corporate social responsibility disclosure in European countries (Verbeeten et al. 2016; Mio et al. 2015; Balluchi et al. 2019, Reverte 2016, Gray et al. 1995; Evangelinos et al., 2016, Maj et al. 2018; Dyduch, Krasodomska, 2017). The studies confirm the differences in the corporate social responsibility disclosures of individual countries due to political, social, cultural, environmental, and macroeconomic factors. There are significant differences in corporate social responsibility disclosures between developing and developed countries. In developing countries, corporations are focused on human resources and issues of local communities, and their reporting is influenced by external factors such as foreign buyers and investors, international media, and international regulatory bodies. At the same time, environmental problems have a higher value in developed countries, and the reporting is mainly influenced by domestic stakeholders (Ali et al. 2017; Ali, Frynas 2017).

Therefore, corporate social responsibility disclosures depend on the region and the industry, which should be limited in the framework of the study. The article focuses on corporate social responsibility disclosures in the European retail industry.

The aim of the study is to provide an up-to-date description of practices in the field of corporate social responsibility disclosures among European retailers.

2. Literature Review

Based on earlier studies, Ali et al. (2018) define corporate social responsibility disclosure as "the voluntary provision of information on a corporation's interaction with its natural and social environment". Many researchers around the world have focused on corporate social responsibility disclosure from various perspectives: Patten (1991); Roberts (1992); Hackston & Milne (1996); Belal (2001); Hussainey et al. (2011); Dyduch, Krasodomska (2017); Ali et al. (2017); Arrive, Feng (2018); Martin et al. (2018); Platonova et al. (2018), etc.

In developed countries, which include the countries of Western Europe, companies perceive a lot of pressure from the public with regards to corporate social responsibility disclosure (Ali et al. 2017). In recent years, the development of corporate social responsibility disclosure in Europe was promoted by the implementation of the Directive on the disclosure of non-financial and diversity information (Directive 2014/95/EU) in 2014, which set the course for increasing the transparency of social and environmental reporting by certain large undertakings and groups. Subsequently, in 2017, the European Commission also presented its guidelines on non-financial reporting (Communication from the Commission 2017 / C 215/01). In specific European countries such as France, Sweden, Norway, the Netherlands, Denmark and Austria, companies are under legal obligation to disclose their social and environmental performance (Balluchi et al. 2019).

Based on an assessment of corporate social responsibility disclosure in EU countries, Bendoraitiene and Butkus (2017) reveal significant flexibility for companies to disclose relevant information. Despite the fact that many EU companies disclose corporate social responsibility, the level and methodology of such disclosure significantly varies from one country to another. Adel et al. (2019) report on the quality of corporate social responsibility disclosure in S&P Europe 350 companies and come to the conclusion that directors' ownership, the presence of a corporate social responsibility committee and firm size positively affect the quality of social reporting. Based on data received from the seventy largest companies in Europe, Etxeberria and Odriozola (2018) find that disclosure positively correlates with social reputation in the anti-corruption area.

Several studies focus on corporate social responsibility disclosure in specific European countries, including Germany (Verbeeten et al. 2016), Italy (Mio et al. 2015; Balluchi et al. 2019), Spain (Reverte 2016), the UK (Gray et al 1995; Evangelinos et al. 2016), and Poland (Maj et al. 2018; Dyduch, Krasodomska 2017).

Various aspects of corporate social responsibility in the retail sector have been investigated by Elg, Hultman (2016), Fani et al. (2015), Deepa, Chitramani (2015), Patten, Zhao (2014), Vo, Arato (2019), Kornilova, Karashchuk (2017) and others. Retail trade is of great socio-economic importance for the development of regions and states, since it provides the population with consumer goods at the right time and place. It creates a large number of jobs, affects financial stability as an important source of tax budget revenues, and promotes the development of related industries, including manufacturing, agriculture, and transport (Rozhnova et al., 2018). Despite interest among researchers in both corporate social responsibility disclosure and corporate social responsibility in the retail sector, there is still a gap in the studies conducted on corporate social responsibility in European retail.

3. Methods

The Global Reporting Initiative's (GRI's) Sustainability Disclosure Database (https://database.globalreporting.org/) as of May 27, 2019 was used to analyze the corporate social responsibility disclosure by European retailers. According to GRI, it provides the world's most widely used standards on sustainability reporting and disclosure. Yevdokimova et al. (2018) refer to GRI as one of the brightest examples of the system of standardization. Reports compiled according to GRI are more credible than information presented in a different form (Dawkins 2004). Using GRI is especially appropriate for corporate social responsibility communication with stakeholders, such as legislators, business press, investors and NGOs (Fernández-Gago et al. 2018).

The breakdown includes reports based on the following filters: sector – retailers; region – Europe; report type – GRI G1, GRI G2, GRI G3, GRI G3.1, GRI G4, GRI Standards. As of the date of gathering data, the Sustainability Disclosure Database contained 343 reports corresponding to these parameters.

The first stage has considered the change in the number of sustainability reports and their distribution among retailers. The breakdown of reports was analyzed in terms of size and country of the company publishing said report, as well as by types of report. In the second stage, the content of reports compiled by retailers in accordance with GRI Standards was studied in more detail. The GRI Standards were published in 2016 and are currently applicable, i.e. they describe current sustainability reporting practices. As of May 27, 2019, the Sustainability Disclosure Database contained 14 sustainability reports by 12 European retailers. The Corporate Social Responsibility Disclosure Indexes (CSRDs) were calculated based on these reports (Table 1):

Table 1. Calculation method of Corporate Social Responsibility Disclosure Indexes of European Retailers

Indexes	Formula	N	Source of the list of disclosures
CSRD	$$\frac{\sum_{i=1}^{n} x_i}{N}$$	144	GRI 102: General Disclosures GRI 103: Management Approach GRI 200: Economic GRI 300: Environmental GRI 400: Social
CSRD General	x_i – Dummy variable ($x_i = 1$, if disclosure i is presented in the report, otherwise $x_i = 0$) N – Number of disclosures	59	GRI 102: General Disclosures GRI 103: Management Approach
CSRD Economic		13	GRI 200: Economic
CSRD Environmental		32	GRI 300: Environmental
CSRD Social		40	GRI 400: Social

Source: compiled by the author

The following scale is used to interpret the calculation results of all five indices in the study (Table 2):

Table 2. Interpretation of Corporate Social Responsibility Disclosure Indexes

Index value		Level of corporate social responsibility disclosure
from	up to	
0.8	1	High
0.6	0.8	Above average
0.4	0.6	Average
0.2	0.4	Below average
0	0.2	Low

Source: compiled by the author

A widespread approach is used in different contexts, including by Martin et al. (2018), Platonova et al. (2018), whereby corporate social responsibility disclosure is characterized by the share of dimensions which are disclosed in the total number of dimensions.

4. Results

As of May 27, 2019, 80 European retailers, which compiled 343 GRI reports, were represented in the Sustainability Disclosure Database. The first three reports were registered by J. Sainsbury (UK), Kesko Corporation (Finland) and Musgrave Group (Ireland) in 2001 according to GRI G1 or GRI G2 standards. In subsequent years, the number of reports increased in a linear fashion, reaching 34 by 2016 (Fig. 1). Thus, over 15 years (2001-2016), the number of sustainability reports by European retailers increased by more than 10 times. As of the date of gathering data, the 2017, 2018 and 2019 information was incomplete and continued to be added to. Therefore, these years are not included in the trend. ATVR (Iceland) and Kesko Corporation (Finland) submitted their reports in 2019. Both reports cover the period from January to December 2018; they are integrated and have undergone external assurance.
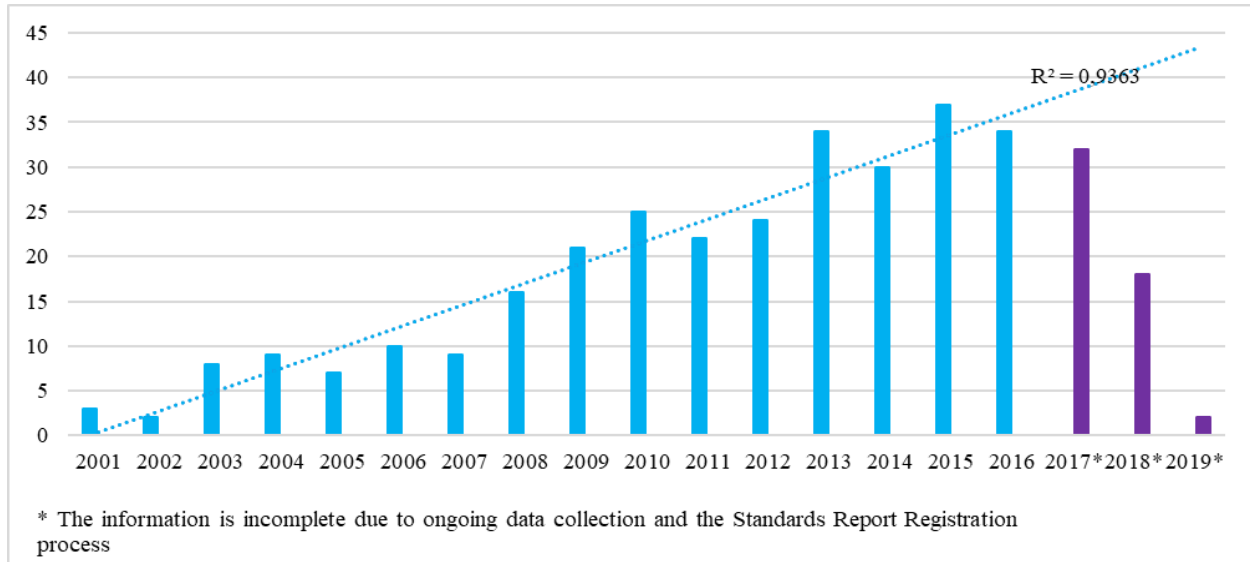
Fig. 1. Number of GRI reports by European retailers

Source: Sustainability Disclosure Database (https://www.globalreporting.org/Pages/default.aspx) as of May 27, 2019, calculations made by the author

More than half of retailers (42 retailers or 52.5%) have registered one or two reports in the Sustainability Disclosure Database (Fig. 2). Sixty companies out of 80, i.e. 75%, have submitted between one and five reports. Among these, there are both retailers who have just started the sustainability reporting practice, and those who have stopped registering reports. Kesko Corporation is in the lead in terms of the number of sustainability reports. The database contains 19 reports submitted by Kesko Corporation during the period from 2001 through 2019.
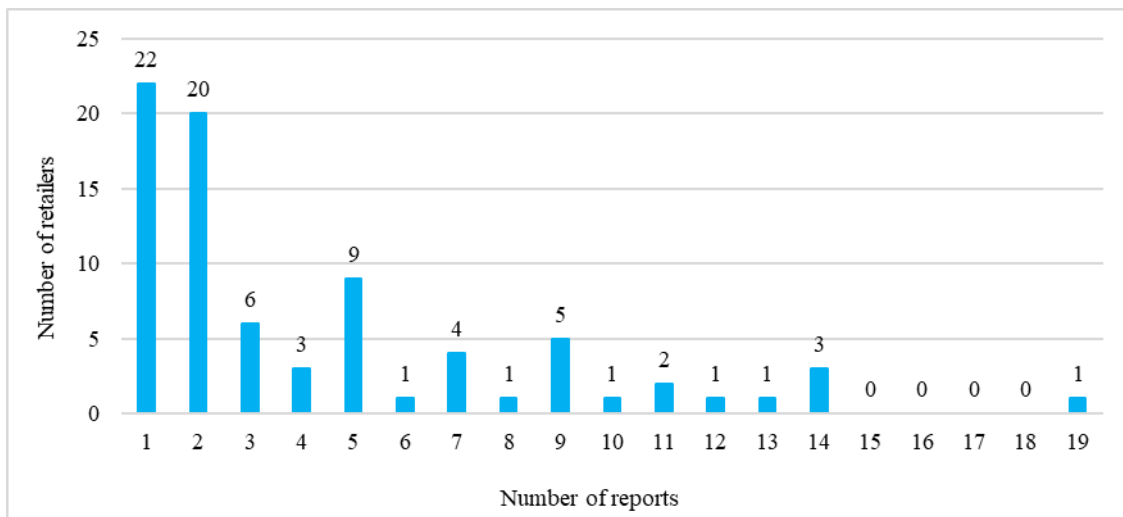
Fig. 2. Distribution of European retailers by number of GRI reports

Source: Sustainability Disclosure Database (https://www.globalreporting.org/Pages/default.aspx) as of May 27, 2019, calculations made by the author

Out of 80 retailers who have registered reports in the Sustainability Disclosure Database, the majority (66.3%) are large ones (Table 3). Large retailers submit more than half (59.2%) of reports. SMEs amount to only 5% of companies and generate 2.9% of reports. In terms of the number of reports, 3 countries are in the lead; Sweden, Finland and Spain, whose retailers submit a combined total of 42.6% of the total number of reports. At the same time, the highest number of retailers submitting sustainability reports is in Spain, the Netherlands, and Germany. Of the 52 countries available in the Sustainability Disclosure Database, reports are submitted by retailers from 20 countries. The "Miscellaneous" group includes Italy, France, Belgium, Austria, Iceland, Greece, Portugal, Ireland, Poland, Russia, Norway, Hungary, and Bulgaria. Reports from each of these countries amount to less than 5% of the total. GRI G3 reports predominate in the breakdown of reports by type. The breakdown of companies by type of reports compiled by them differs; GRI G4 reports predominate.

Table 3. Breakdown of GRI reports by European retailers

Parameters		Companies		Reports	
		Number	Share, %	Number	Share, %
Size	Large	53	66.3	203	59.2
	MNE	23	28.8	130	37.9
	SME	4	5.0	10	2.9
Country	Sweden	9	11.3	58	16.9
	Finland	5	6.3	45	13.1
	Spain	11	13.8	43	12.5
	Germany	10	12.5	33	9.6
	The Netherlands	11	13.8	31	9.0
	UK	6	7.5	25	7.3
	Switzerland	3	3.8	24	7.0
	Miscellaneous	25	31.3	84	24.5
Report Type	GRI - G1	4	5.0	4	1.2
	GRI - G2	14	17.5	35	10.2
	GRI - G3	43	53.8	146	42.6
	GRI - G3.1	25	31.3	35	10.2
	GRI - G4	53	66.3	109	31.8
	GRI - Standards	12	15.0	14	4.1
Total		**80**	**100**	**343**	**100**

Source: Sustainability Disclosure Database (https://www.globalreporting.org/Pages/default.aspx) as of May 27, 2019, calculations made by the author

Currently, the GRI Standards are applicable. As of May 27, 2019, the Sustainability Disclosure Database contained 14 reports submitted by retailers according to GRI Standards. These reports were compiled by 12 companies: ALDI SOUTH GROUP (Germany), Alko (Finland), Aspiag Service Despar Nordest Srl (Italy), ATVR (Iceland), Consum (Spain), Dufry (Switzerland), Inditex (Spain), Kesko Corporation (Finland), Mekonomen (Sweden), Plantasjen (Norway), SPAR Österreich (Austria), and Tokmanni (Finland). Two reports were registered in 2017, two more in 2019, and the rest in 2018.

Reports compiled according to GRI Standards by European retailers have been used to calculate the Corporate Social Responsibility Disclosure Indexes (Table 4). The mean and median CSRD values slightly exceed 0.5, i.e., on average, retailers make over 50% of the disclosures provided for by the GRI Standards. Among individual factors, the CSRD general has the highest values. Its maximum value of 1 indicates that the retailer makes all general disclosures. The same index has the lowest variability (with a variation coefficient of 20%). The highest variability is specific to CSRD environmental, which varies within a range of 0.031 to 0.938, with a variation coefficient of 75%. At the same time, the mean and median values slightly exceed 0.3; on average, retailers

provide about one third of environmental disclosures. The CSRD economic and CSRD social have less variability compared to the CSRD environmental and higher mean values; however, they also vary within a wide range.

Table 4. Corporate Social Responsibility Disclosure Indexes of European retailers

Index	Min.	Max.	Median value	Average	Mean deviation	Dispersion	Standard deviation	Variation coefficient
CSRD	0.299	0.910	0.521	0.571	0.188	0.035	0.188	33%
CSRD General	0.593	1.000	0.729	0.763	0.152	0.023	0.152	20%
CSRD Economic	0.077	1.000	0.615	0.560	0.296	0.088	0.296	53%
CSRD Environmental	0.031	0.938	0.313	0.348	0.261	0.068	0.261	75%
CSRD Social	0.075	0.800	0.513	0.470	0.202	0.041	0.202	43%

Source: calculations made by the author

The median and mean values characterize the level of Corporate Social Responsibility Disclosure as "average" and "above average", except for environmental responsibility, where the values correspond to the "below the average" level. Leading European retailers demonstrate a high level in all aspects of Corporate Social Responsibility Disclosure, with minimum indicators varying. Individual retailers demonstrate a low level of economic, environmental and social disclosures, however the lowest level of general disclosures is average and approaches the "above average" level. In addition, there are no companies with a low level of Corporate Social Responsibility Disclosure among the retailers being analyzed.

Thus, the most widely made disclosures by European retailers are the general disclosures. Out of 56 disclosures provided for by GRI 102, 31 are present in all the reports reviewed. That is, all retailers disclose information on their organizational profile, include statements from senior decision-makers, and describe the governance structure, stakeholder engagement and reporting practice. Moreover, all the reports contain disclosures as per GRI 3 "Management Approach". The least disclosed are Disclosure 102-34 "Nature and the total number of critical concerns" and Disclosure 102-27 "Stakeholders' engagement in remuneration" (Fig. 3).

Among the economic disclosures, Disclosure 205-2 "Communication and training about anti-corruption policies and procedures" (present in 93% of reports) and Disclosure 201-1 "Direct economic value generated and distributed" (present in 86% of reports) were the most common. However, only 21.4% of reports contain disclosures describing market presence (GRI 202) (Fig. 3).

As previously mentioned, the environmental disclosures are the most variable in the reports by European retailers. The most common among them is Disclosure 302-1 "Energy consumption within the organization", which is included in 93% of the reports. More than half of retailers also include information related to energy intensity and reduction of energy consumption, GHG emissions, and waste. At the same time, the reports by retailers lack information on water discharge and consumption and provide almost no information on protected areas and the IUCN Red List species (Fig. 4).

Among social disclosures, the only disclosure mentioned in all the reports by European retailers is Disclosure 404-4 "New employee hires and employee turnover". More than 90% of retailers disclose information on hazard identification, risk assessment, and incident investigation within the context of occupational health and safety, as well as information on the impact of goods and services on the health and safety of consumers. At the same time,

the reports lack information on several other aspects of occupational health and safety (Disclosures 403-5 and 403-10) and on indigenous peoples' rights (Disclosure 411-1) (Fig. 4).
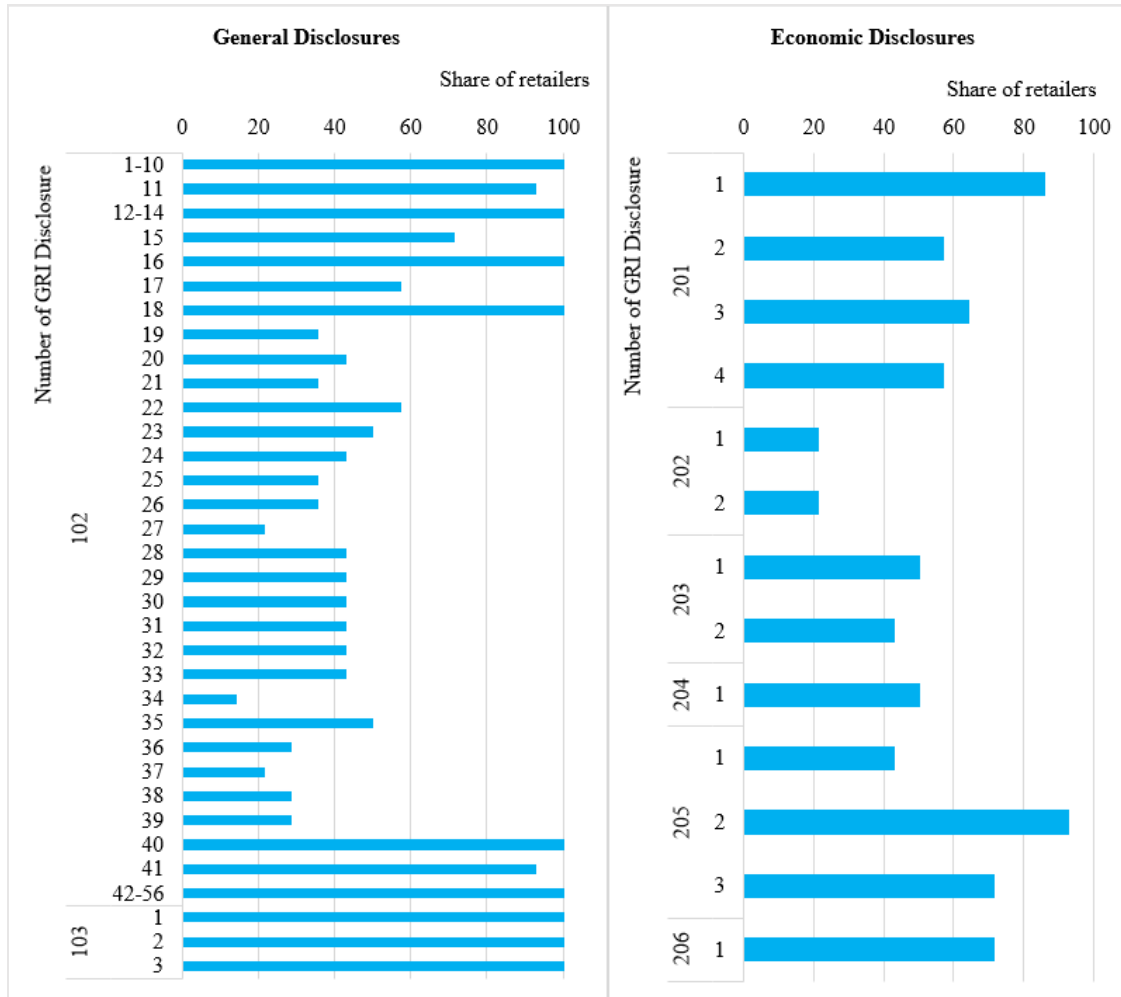
Fig. 3. General and Economic disclosures by European retailers according to GRI Standards

Source: compiled by the author

Thus, European retailers mainly give consideration to general disclosures, with more than half of these mentioned in all the reports reviewed. Among the special aspects of corporate social responsibility, the most common were issues of anti-corruption, energy consumption, staff recruitment and turnover, as well as hazard identification, risk assessment, incident investigation in the context of occupational health and safety, and the impact of goods and services on the health and safety of consumers. Some of the aspects less discussed by European retailers include information on water consumption, protected areas and rare animal species, certain aspects of occupational health and safety (such as worker training, promotion of worker health, work-related injuries and ill health, etc.) and indigenous peoples' rights.
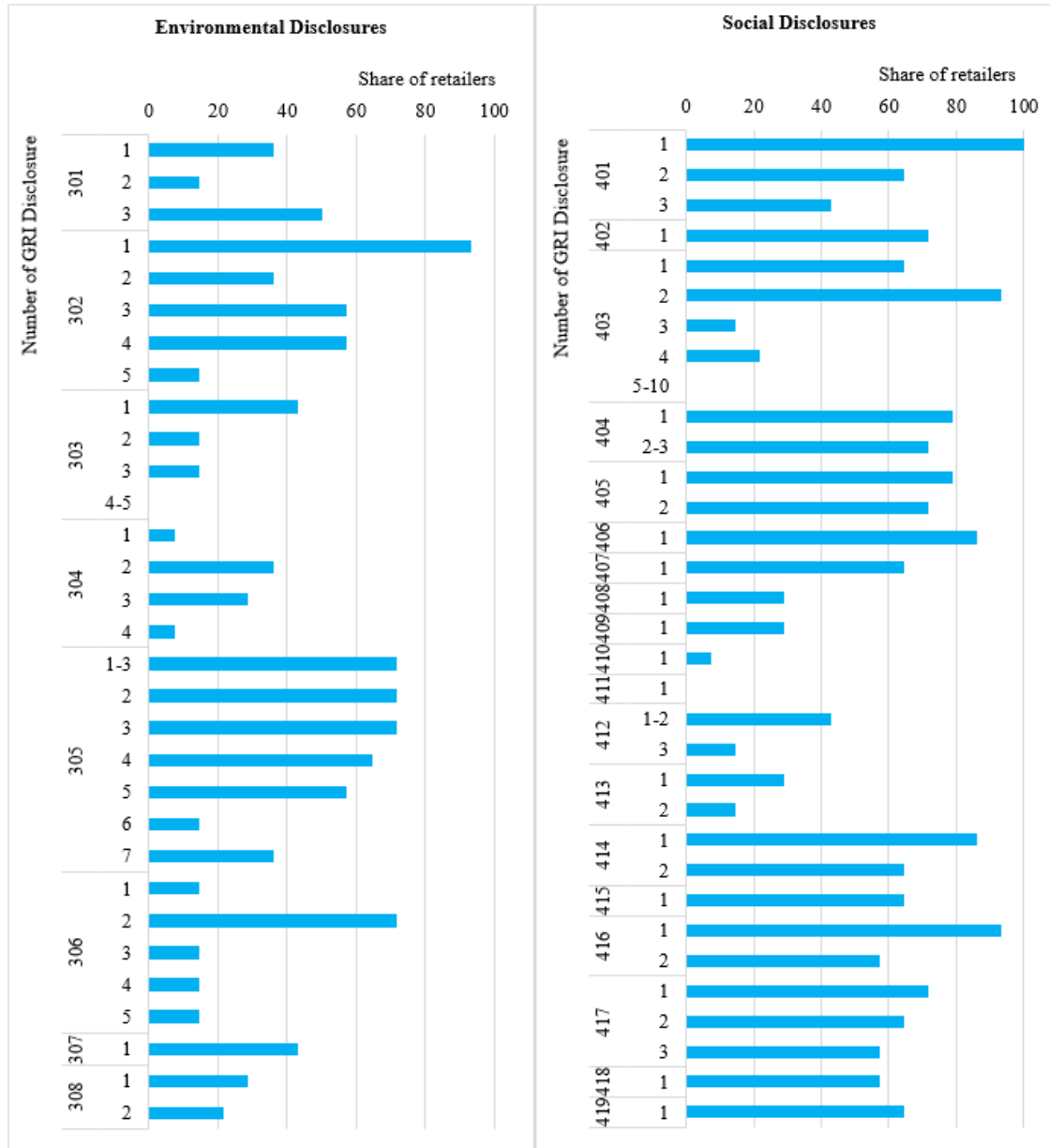
Fig. 4. Environmental and Social disclosures by European retailers according to GRI Standards

Source: compiled by the author

5. Discussion

The increase in the number of reports by European retailers on corporate social responsibility is logical and will continue in the coming years. This is due, on the one hand, to the increasing importance of social and environmental issues and stricter government requirements for business, and on the other hand, to the benefits and competitive advantages acquired by companies through corporate social responsibility. Such benefits are due to an improved business reputation, strengthening of the company's appeal as an employer, customer loyalty, reduced risks, increased market capitalization, increased business sustainability, efficiency and competitiveness

on the whole (Ignatenko 2015; Vinogradova et al. 2016; Sysoeva et al. 2017; Mayorova 2018; Yoo, Lee 2018; Chung et al. 2018).

More than half of the reports compiled are from large retailers. After all, large companies possess the necessary resources for developing corporate social responsibility, including the highest level, philanthropy. The size of the company is recognized as one of the factors affecting corporate social responsibility disclosure (Ali et al. 2017; Gantyowati 2017; Balluchi et al. 2019).

The prevalence of the general disclosures in the reports by European retailers is logical. It is assumed that after disclosing the basic aspects of corporate social responsibility, retailers will increase the scope of information provided. Economic disclosures are contained in all the reports considered to varying extents. The greatest variability is seen with regards to environmental disclosures. It is believed that environmental responsibility on the whole is not a priority for retailers. Particular attention is paid to environmental responsibility by industries that adversely affect the environment, primarily production, while consumer-oriented companies focus on responsibility to the community, as this allows them to improve their image and increase sales (Dierkes, Preston 1977; Cowen et al 1987; Hackston, Milne 1996).

According to the results, the key environmental aspects for retailers are related to energy consumption, carbon dioxide emissions and waste. Energy saving and energy efficiency in retail are primarily related to store lighting (using energy-saving lightbulbs) and refrigeration equipment (using ozone-friendly refrigerants). Reducing carbon dioxide emissions in retail is a pressing issue due to the widespread use of motor vehicles. Waste is mainly due to the large volume of packaging materials, including plastic and cardboard.

Despite the spread of corporate social responsibility among European retailers, the number of sustainability reports over nineteen years amounted to 343, with the maximum number of reports per year being 37 (in 2015). That said, the overall number of reports drawn up in accordance with the applicable GRI Standards was 14, but it is precisely these reports which describe the most relevant sustainability reporting practice. At the moment, the number of reports limits the results of the study. As sustainability reports become more widespread in the future, it will be possible to supplement the results and conclusions on corporate social responsibility disclosure by European retailers.

Conclusions

This study of corporate social responsibility disclosure by European retailers has led to the following results and conclusions.

1. The number of sustainability reports by European retailers is increasing in a linear fashion. More than half of the reports are compiled by large companies with adequate resources. In terms of the number of retailers compiling sustainability reports among the European countries, the Netherlands and Spain are in the lead, and in terms of the number of reports compiled, Sweden and Finland. In Eastern Europe, sustainability reporting practice is less developed. In terms of the number of reports and the duration of report generation, the Finnish retailer Kesko Corporation is the leader in Europe; its practice can be considered an example for other companies. At present, over 40% of reports correspond to GRI - G3. According to the GRI - Standards applicable since 2016, 14 reports (4.1% of the total) were compiled.

2. The level of corporate social responsibility disclosure of European retailers varies from "below the average" to "high" with an average CSRD of 0.571, which corresponds to the "average" level. It is logical that retailers mostly present the general disclosures in their reports. The minimum level of such reports is at the boundary of "average" and "above average"; the maximum level is "high" with the CSRD General being equal to 1. The

general disclosures are also characterized by the least variability. The level of economic, environmental and social disclosure varies from low to high. The environmental disclosures are characterized by the lowest average and median values, and the greatest variability.

3. More than half of the general disclosures are presented in the sustainability reports of all the retailers considered; the remaining general disclosures are mentioned in individual reports. Among the economic disclosures, the "Communication and training on anti-corruption policies and procedures" and "Direct economic value generated and distributed" turned out to be the most popular. The typical environmental disclosures for retailers are related to energy consumption, carbon dioxide emissions, and waste. Among social disclosures, the most popular ones are the "New employee hires and employee turnover" (present in all the reports), as well as those associated with hazard identification, risk assessment, and incident investigation in the context of occupational health and safety, and the impact of goods and services on the health and safety of consumers. Disclosures related to water consumption, protected areas and IUCN Red List species, certain aspects of occupational health and safety (such as worker training, promotion of worker health, work-related injuries and ill health, etc.) and indigenous peoples' rights were less common among the European retailers.

Thus, the analysis of sustainability reports made it possible to provide an up-to-date description of the European retailers' practices in corporate social responsibility disclosures. The results may be useful for retailers who are beginning to create sustainability reports, including in terms of examples of best practices and industry-specific features of retail corporate social responsibility. Since the level of corporate responsibility in developed European countries is generally relatively high, the practice of European retailers may be useful to other (developing) regions.

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WHAT DRIVES ECONOMIC GROWTH SUSTAINABILITY? EVIDENCE FROM INDONESIA[*]

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Abstract. This paper analyzes the determinants of economic growth sustainability in Indonesia. Based on annual data 1971-2017, this research applies the vector error correction model (VECM) to estimate the dynamic effects of the inflation rate, tax ratio, government spending, broad money, and exchange rate on economic growth. The findings present the existence of long-run equilibrium in a set of those variables. Specifically, the price level and fiscal policy have positive impact on economic growth sustainability. We also find that the effect of monetary policy on economic growth is neutral. The monetary authority should strengthen the impact of monetary variables on economic growth. The exchange rate is part of international factors that threats the economic growth sustainability. It implies that economic growth sustainability is closely related to the international financial sector. Therefore, the central bank should control the exchange rate variable at the safety level to maintain economic growth sustainability.

Keywords: economic growth; exchange rate; fiscal; monetary; sustainability

1. Introduction

In many developing countries, economic development mainly focuses on achieving economic growth and stabilizing the inflation rate at acceptable levels. Economic growth is one of the main macroeconomic variables, which indicates the quality of living standard and welfare level of the people in the country. It is important for all countries to preserve economic growth sustainability in the long period. For this reason, the government should pay more attention to the inflation rate to maintain sustainable economic growth. Specifically, low inflation is preferable to support stable economic growth (Akinsola & Odhiambo, 2017; Crafts, 2013; Kasidi & Mwakanemela, 2013; Sattarov, 2005). Since the inflation rate has a direct relationship with economic growth, a higher inflation rate will cause lower real economic growth. Finally, it will reduce the living standard and real income. Therefore, we can say that economic growth is potentially unsustainable. Many factors may affect

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economic growth sustainability, such as inflation rate, fiscal, and monetary policy as well as an international factor (Akinsola & Odhiambo, 2017; Barro, 2013; Bošnjak, 2018; Bukhari & Yusof, 2014; Butkiewicz & Yanikkaya, 2011; Gupta, 2011; Kasidi & Mwakanemela, 2013; Tsaurai & Odhiambo, 2013; Tvaronavičienė, 2019; Sasongko *et al.*, 2019; Zeibote *et al.*, 2019).

Similar to inflation that directly affects economic growth, fiscal and monetary policy may also influence economic growth sustainability. Some papers mention that expansive fiscal policy has positive effects on economic growth (Auerbach, Gale, & Harris, 2010; Nguyen, 2015; Raji, Juzhar, & Jantan, 2014). Likewise, the expansive monetary policy is also the main factor in supporting economic growth in various countries (Černohorská, 2018; Sirag, SidAhmed, & Ali, 2018; Tule, Ogundele, & Apinran, 2018). Therefore, we may infer that the expansive fiscal and monetary policies will encourage economic growth sustainability. International factor such as exchange rate may affect the economic growth sustainability through domestic currency depreciation mechanisms. Some previous papers highlight the relationship between exchange rate and economic growth (Karras, 2011; Mahmoodi & Mahmoodi, 2016).

As a member of developing countries, Indonesia has experienced some episodes of the economic development process as long the period of development plan. In 1971, the central government arranged the document of an economic development plan for the medium and long period. The long term development plans focus on three economic indicators, namely, sustainable economic growth, equity, and price stabilization. Sustainable economic growth was one of the main focuses of the development plan to improve the standard of living at the national level. The income inequality in Indonesia was one of the important issues as consequences of the large area of the country and the big numbers of the population. Meanwhile, the price stabilization policy was the priority of the development process as an impact hyperinflation phenomenon which emerged in 1965-1970. However, economic growth sustainability has become a challenge in Indonesia for a long period of development process until nowadays.

For about twenty years of the development process, Indonesia has successfully changed the economic structure from a purely agricultural economy into the semi industry country. Economic growth was stable at about 7 percent, and the inflation rate was less than 10 percent. Unfortunately, the deep financial crisis attacked most of the Asian countries, including Indonesia in 1997. As an impact of this crisis, economic growth dropped at about -13 percent, and inflation jumped to 58 percent in 1998 (Figure 1). In response to that situation, the central government made some policies to stabilize the price level and to recover economic growth. As a result, the national economy has successfully recovered in about three years, which was indicated by positive economic growth, and the inflation rate was less than 10 percent. Based on this brief phenomenon, it is important to study the issue of economic growth sustainability and to fill the recent literature regarding economic development policies.

This paper elaborates the determinants of economic growth sustainability in the case of Indonesia. The organization of this paper continues as follows. The next section is the related literature, which presents a review of previous studies. Then, the empirical analysis contains the model specification and analysis procedure. The proceeding section presents empirical findings and discussion. The last section is the conclusion of the research.

2. Related Literature

The issue of sustainable economic growth has emerged in the last decade. Some papers have discussed the sustainable economic growth is part of the sustainable development program in many countries (Spangenberg, 2006; Armeanu, Vintilă, and Gherghina, 2018; Jovovic *et al.*, 2018; Kurniawan and Managi, 2018). Sustainable economic growth has become an important part of the global view of economic development since the declaration of Sustainable Development Goals (SDGs) in 2016. All countries should concern with the issue of sustainable

economic growth to ensure that the development in their countries has improved their living standard. Many factors may affect the sustainable economic growth such as inflation rate, the quality of government policies, infrastructure, and global environment.

The inflation rate is one of the macroeconomic variables, which has a closet relationship with economic growth. The increase in the inflation rate will cause lower real economic growth. Some previous studies found the negative effect of inflation on economic growth (Akinsola & Odhiambo, 2017; Barro, 2013; Bukhari & Yusof, 2014; Gupta, 2011). A high inflation rate has substantial effects on reducing the standards of living in many countries (Barro, 2013). In the long-run, the raises of ten percent inflation rate will cause a decrease in GDP at about 4 percent. Otherwise, Akinsola and Odhiambo (2017) found that the effects of inflation on economic growth is debatable. The effect of inflation on economic growth is negative in developed countries. Otherwise, its effect is positive on economic growth in other countries. The negative relationship means a higher price associated with lower economic growth. Therefore, a high target of economic growth requires a low inflation rate. In this case, the low inflation rate will support sustainable economic growth. This situation is economically reasonable because people will have a high real income. Therefore, controlling the inflation rate is important to keep the sustainable economic growth.

The quality of fiscal policy is also an important factor in sustainable economic growth. There are some instruments of fiscal policy, such as tax revenue and government spending. As part of the government budget, tax revenue will determine economic growth. An increase in tax ratio provides a higher budget for government activities, which potentially improve the economic activity in the public sector. An expansive fiscal policy through high government spending will become one of some key factors of economic growth. Some previous studies highlight the positive relationship between government spending and economic growth (Bošnjak, 2018; Butkiewicz & Yanikkaya, 2011; Tsaurai & Odhiambo, 2013). Regarding sustainable economic growth, a positive effect of government spending on economic growth supports the sustainability of economic growth.

The monetary sector plays an important role in the economy through the dynamic changes of the money supply. The expansive monetary policy through the increase in money supply leads to a higher investment opportunity. Previous studies confirm the important role of the monetary sector on economic growth in various countries (Černohorská, 2018; Sirag et al., 2018; Tule et al., 2018). The monetarist view states that money supply and economic activity has a positive relationship. Therefore, the increase in money supply associated with higher economic growth. An expansive monetary sector will support economic growth sustainability.

International factor such as the volatility in the international financial market generally has an impact on the domestic economic activity of the country through exchange rate changes. The depreciation of a currency will potentially affect economic activity in the country. The exchange rate volatility as an impact of depreciation or appreciation of the currency is an important factor of economic growth. Some papers mention that exchange rate volatility has a significant effect on economic growth (Karras, 2011; Mahmoodi & Mahmoodi, 2016). The depreciation of the currency potentially causes lower economic growth. Therefore, controlling the exchange rate is crucial for the country to maintain sustainable economic growth.

In line with the Sustainable Development Goals (SDGs) as the global view, sustainable economic growth will be an important part of the development process in all countries. A few papers consider the capital and human resources as determinants of sustainable economic growth in some countries. However, only limited papers focus on the role of the fiscal and monetary policy on sustainable economic growth. Therefore, identification of some factors that affect economic growth may provide new insight into the recent studies. Specifically, this study attempts to fill the gap of the literature by elaborating the determinants of economic growth sustainability for the Indonesian case. This research may be useful for other countries regarding the formulation of sustainable economic growth policies.

3. Empirical Analysis

3.1. Data and variables

This study empirically estimates some equations of a set of variable which involve economic growth, inflation rate, tax ratio, government spending, and exchange rate. The data are annual time series for the period of 1971-2017. The variable economic growth and inflation are in annual percent. The variable tax ratio and government spending are in percent of real GDP. Meanwhile, the broad variable money is in Trillion rupiahs. Exchange rate of Indonesian currency is the ratio between US$ and Indonesian Rupiah. The data inflation rate, broad money, and exchange rate are from several annual statistical reports of the Bank Indonesia (http://www.bi.go.id/en/). Meanwhile, the data of fiscal variables such as tax ratio and government spending are from annual reports of Indonesia Fiscal Policy Agency (http://www.fiskal.kemenkeu.go.id/).

3.2. Cointegration test

This research focuses on the dynamic analysis of economic growth sustainability using vector error correction model (VECM). The reason is that the method may encompases the dynamic impact of selected independent variables on the economic growth. The empirical estimation using that approach requires the co-integration test and should involve the first difference variables. This approach is in line with some previous research, which also applied dynamic analysis (Khundrakpam, 2010; Bozkurt, 2014; Fakher, 2016). The co-integration analysis implies some prerequisite tests regarding the stationary properties of the data before running the empirical estimation. Most of the macroeconomic variables contain data that are not stationary in their level. Therefore, we should transform into the first difference to achieve their stationary form (Enders, 2010). The data is stationary if its mean and variance are zero and unchanged over time.

The co-integration analysis includes two steps, stationary testing of the variables and estimation process of the cointegration equation. This research applies the Augmented Dickey-Fuller (ADF) method for data stationary testing and Johansen's multivariate procedure for co-integration analysis (Johansen, 1991). As widely used in recent economic research, Johansen cointegration method applies vector autoregression (VAR) model to test the cointegration relationship in among time series variables. Cointegrating equation presents a long run relationship which is indicated by the significance of maximum eigenvalues (λ_{max}) and trace test. We accept the hypothesis of at least one cointegrating vectors using likelihood ratio trace test. We reject or accept the hypothesis based on the probability value of MacKinnon, Haug, & Michelis, (1999). Cointegrating relationship occurs due to rejecting at least none cointegrating statement.

According to Johansen (1991), a VAR model fits the data with the appropriate lag structure. Specifically, a VAR model of order *n* of a set time series variables (A) is as follows.

$$\Delta y_t = A_0 + \sum_{i=1}^{n-1} \Gamma_i \Delta y_{t-1} + \alpha\beta' y_{t-n} + \varepsilon_t \tag{1}$$

Matrix Γ equals to $\alpha\beta'$ and captures the long-run relationship among the examined variables. Matrices α and β are (n x r) dimensions, r is the rank of the matrix Γ. The rank of the coefficient of matrix Γ gives the number of cointegrating vectors. The matrix β contains the long-run coefficients which represent the co-integrating relationship. The matrix α expresses the adjustment process from short-run disequilibrium toward long-run equilibrium. The estimation procedure assumes that the matrix Γ in an unrestricted form. The cointegration restrictions test imply accepting the rank of matrix Γ. The rank number of Γ equals the number of cointegrating vectors based on the maximum Eigenvalues (λ_{max}) and Trace statistics. We accept the presence of cointegrating relationship if at least one cointegrating equation exists.

3.3. The Model Specification

We consider a dynamic analysis which involves some economic variables. As widely used in economic analysis, the cointegration and vector error correction model (VECM) can capture the causality relationship among some economic variables. Before formulating the econometric equations, we should develop an economic model which consists of a set of variables. In this study, we examine a set of economic variables as mentioned before, namely economic growth, inflation rate, tax ratio, government spending, broad money, and exchange rate. According to the standard VECM model, we may formulate the five equations as follows.

$$\Delta eg_t = \alpha_{1i} + \beta_{1i}\sum_{i=1}^{n}\Delta eg_{t-i} + \lambda_{1i}\sum_{i=1}^{n}\Delta p_{t-i} + \delta_{1i}\sum_{i=1}^{n}\Delta tr_{t-i} + \phi_{1i}\sum_{i=1}^{n}\Delta gs_{t-i} + \eta_{1i}\sum_{i=1}^{n}\Delta bm_{t-i}$$
$$+ \varphi_{1i}\sum_{i=1}^{n}\Delta er_{t-i} + \gamma_{1i}ECT_{1t} + \varepsilon_{1t} \tag{2}$$

$$\Delta p_t = \alpha_{2i} + \beta_{2i}\sum_{i=1}^{n}\Delta eg_{t-i} + \lambda_{2i}\sum_{i=1}^{n}\Delta p_{t-i} + \delta_{2i}\sum_{i=1}^{n}\Delta tr_{t-i} + \phi_{2i}\sum_{i=1}^{n}\Delta gs_{t-i} + \eta_{2i}\sum_{i=1}^{n}\Delta bm_{t-i}$$
$$+ \varphi_{2i}\sum_{i=1}^{n}\Delta er_{t-i} + \gamma_{2i}ECT_{2t} + \varepsilon_{2t} \tag{3}$$

$$\Delta tr_t = \alpha_{3i} + \beta_{3i}\sum_{i=1}^{n}\Delta eg_{t-i} + \lambda_{3i}\sum_{i=1}^{n}\Delta p_{t-i} + \delta_{3i}\sum_{i=1}^{n}\Delta tr_{t-i} + \phi_{3i}\sum_{i=1}^{n}\Delta gs_{t-i} + \eta_{3i}\sum_{i=1}^{n}\Delta bm_{t-i}$$
$$+ \varphi_{3i}\sum_{i=1}^{n}\Delta er_{t-i} + \gamma_{3i}ECT_{3t} + \varepsilon_{3t} \tag{4}$$

$$\Delta gs_t = \alpha_{4i} + \beta_{4i}\sum_{i=1}^{n}\Delta eg_{t-i} + \lambda_{4i}\sum_{i=1}^{n}\Delta p_{t-i} + \delta_{4i}\sum_{i=1}^{n}\Delta tr_{t-i} + \phi_{4i}\sum_{i=1}^{n}\Delta gs_{t-i} + \eta_{4i}\sum_{i=1}^{n}\Delta bm_{t-i}$$
$$+ \varphi_{4i}\sum_{i=1}^{n}\Delta er_{t-i} + \gamma_{4i}ECT_{4t} + \varepsilon_{4t} \tag{5}$$

$$\Delta er_t = \alpha_{5i} + \beta_{5i}\sum_{i=1}^{n}\Delta eg_{t-i} + \lambda_{5i}\sum_{i=1}^{n}\Delta p_{t-i} + \delta_{5i}\sum_{i=1}^{n}\Delta tr_{t-i} + \phi_{5i}\sum_{i=1}^{n}\Delta gs_{t-i} + \eta_{5i}\sum_{i=1}^{n}\Delta bm_{t-i}$$
$$+ \varphi_{5i}\sum_{i=1}^{n}\Delta er_{t-i} + \gamma_{5i}ECT_{5t} + \varepsilon_{5t} \tag{6}$$

Equations (2)-(6) are also known as part of the vector error correction model (VECM) which explains the existence of the short-run relationship in among a set of variables. For addition, each equation describes the relationship between dependent variables and its explanatory variables, including error correction term (ECT). A negative and significant error correction term (γ_i) indicates the existence of a long-run relationship between the dependent and its independent variables (Bozkurt, 2014; Fakher, 2016; Feridun & Adebiyi, 2005). The optimum lag length of this autoregressive model (ADL) model is determined using information criteria such as Schwarz Criterion (SC) and Akaike Information Criterion (AIC). The error correction term also measures the speed of adjustment from short-run deviations to long-run equilibrium. Regarding this issue, we use the cointegration approach to test the existence of long-run equilibrium in among underlying variables.

4. Empirical Results and Discussion

4.1. Data description

Before conducting the empirical analysis of cointegration and VECM model, it is important to describe the behavior of the data of the examined variables. We present the descriptive statistic indicators of the variables in Table 1. Meanwhile, Figure 1 and Figure 2 depict the selected variables. Focusing on the descriptive statistic indicators, the mean of economic growth is 5.94%, with a maximum value of 9.77% and minimum at -13.12% in 1998. The lowest economic growth was as an impact of monetary crisis, which occurred in 1997. The inflation rate has its maximum value at 58.40% in 1998, also a consequence of the monetary crisis in 1997. The mean value of the inflation rate is about 11.2% indicating the high-level price instability economy.

Table 1. Descriptive Statistic of Variables

Variables	Descriptive Statistic Indicators				
	Mean	Median	Maximum	Minimum	Standard Deviation
Economic Growth (%)	5.94	6.17	9.77	-13.12	3.42
Inflation Rate (%)	11.18	8.30	58.40	3.53	9.80
Tax Ratio (% of GDP)	4.44	1.36	13.83	0.08	5.02
Government Spending (% of GDP)	14.69	11.38	22.89	7.16	5.85
Broad Money (Trillion IDR)	984.45	159.95	5,321.43	14.07	1,475.67
Exchange Rate (US$/Rp)	4964.85	2,155.00	16,800.00	415.00	4,764.81

Source: http://www.bi.go.id/en/ and http://www.fiskal.kemenkeu.go.id/

The volatility of economic growth along the period of 1971-2017 was not extreme unless in 1998 when the deep monetary crisis attacked the country (Figure 1). Compared to fiscal variables such as tax ratio and government spending, economic growth appears similar behavior. It may note that the tax ratio was higher than economic growth since 2000. This phenomenon is a positive indicator for the economic growth sustainability in the long-run. Government spending, which is in the percentage of real GDP, has grown faster than economic growth since the 1990s. It indicates that the government sector has played a more important role in the economy since that period comparing before. Comparing to the inflation rate as described in Figure 2, the economic growth is mostly lower along the period of 1971-2017, indicating potential inflationary effects on real income.
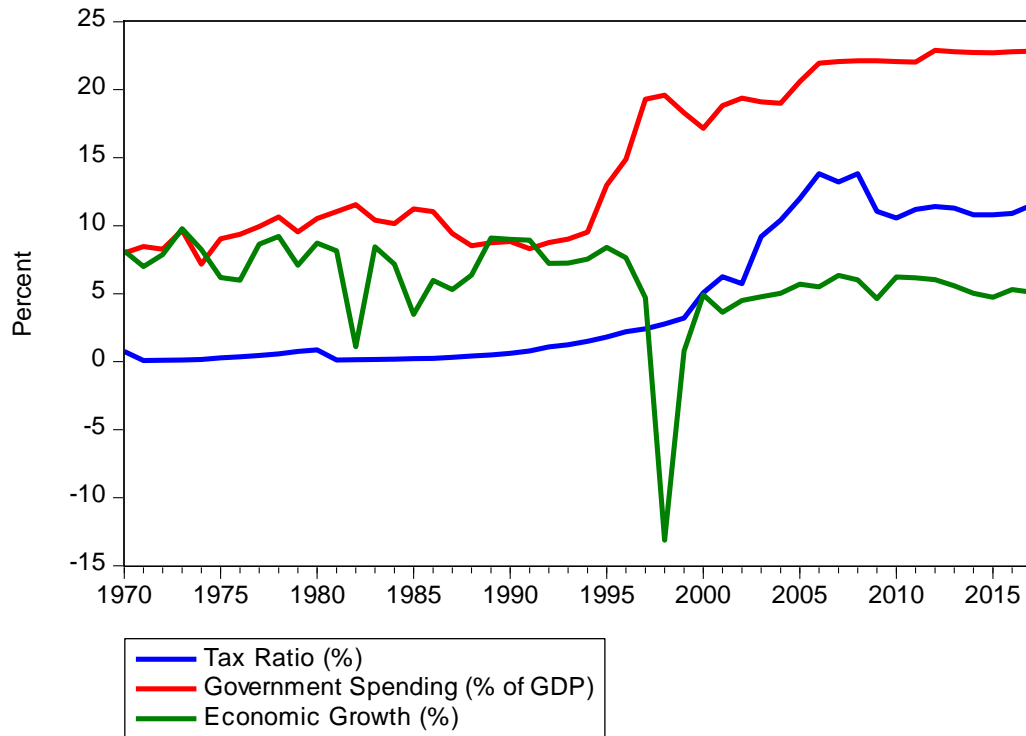
Figure 1. The behavior of Economic Growth, Tax Ratio, and Government Spending
Source: http://www.fiskal.kemenkeu.go.id/
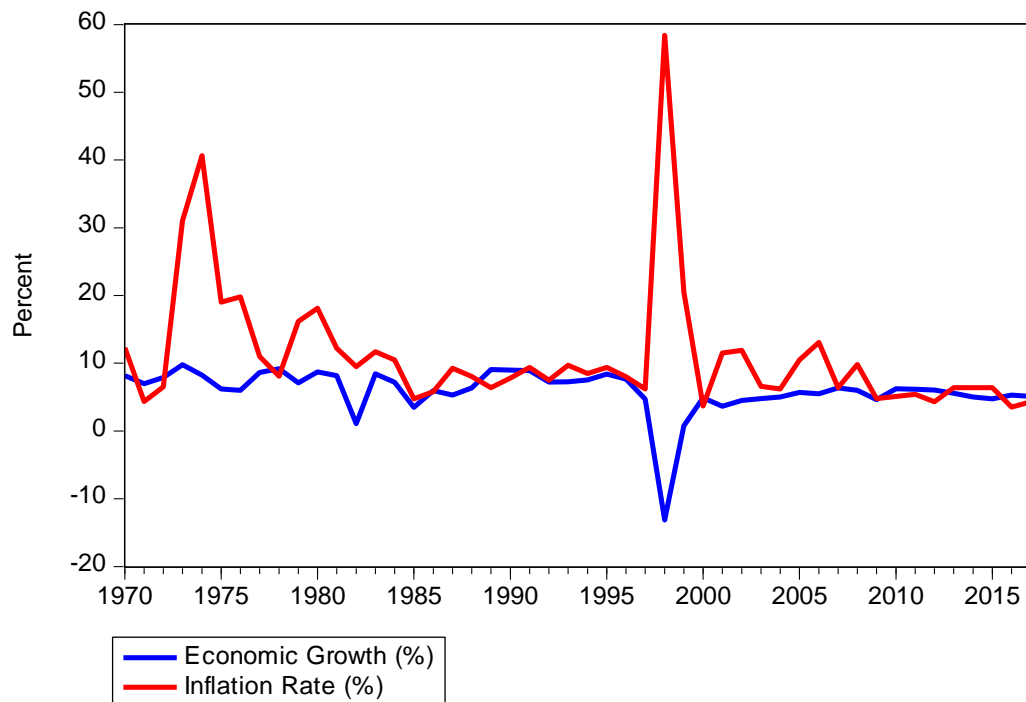
Figure 2. The behavior of Economic Growth and Inflation Rate
Source: http://www.bi.go.id/en

4.2. Cointegration analysis

The presence of cointegrating relationship represents the long-run relationship among examined variables. Before estimating cointegration analysis, we should conduct stationary testing for all variables. The standard procedure of such testing is unit root test using Augmented Dicky-Fuller (Dicky & Fuller, 1981). The results of the unit root test of all variables are in Table 2. We estimate the testing based on individual data series with intercept and time trend component. The results show that the data contains unit root in the level. It implies that we accept the hypothesis of non-stationary data. Otherwise, we reject this hypothesis in the first difference, at least at 5 % level for all variables (Table 2). These indicate that all the data series are stationary in first difference or integrated into the first difference. Therefore, we may write that all the data are in I(1). Cointegration test is valid if all data series are stationary at the first difference.

Table 2. Results of Unit Root Test using Augmented Dickey-Fuller

Variables	The equation contains an intercept only		The equation contains intercept and trend	
	Level	First Difference	Level	First Difference
Economic growth	-1.23	[-7.47]***	-1.96	[-19.9]***
Inflation Rate	-1.48	[-7.91]***	-2.14	[-21.3]***
Tax Ratio	-2.35	[-3.58]**	-1.96	[-5.73]***
Government Spending	-2.06	[-5.81]***	-1.78	[-5.80]***
Broad Money	-2.613	[-6.92]***	-1.97	[-10.9]***
Exchange Rate	-0.59	[-6.69]***	-1.22	[-10.3]***

*Note: Values in the [ ] are t-statistic. *** and ** indicate significant at 1% and 5% level*
Source: Author's analysis.

Table 3. Results of Cointegration test

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigenvalue Statistic	Critical Value at 0.05	Probability**
None *	0.509	84.156	83.937	0.048
At most 1	0.357	51.402	60.061	0.216
At most 2	0.273	31.052	40.174	0.301
At most 3	0.233	16.332	24.275	0.356
At most 4	0.071	4.071	12.320	0.700
At most 5	0.013	0.646	4.129	0.481

Cointegrating equation:
eg: $13.83 + 0.029p_t + 1.03tr_t{}^{***} + 0.67gs_t{}^{***} + 0.0004bm_t - 0.0006er_t{}^{***}$

*Note: * denotes rejection of the hypothesis at the 0.05 level. **MacKinnon-Haug-Michelis (1999) p-values.*
*** denote significant at the 0.01 level.*
Source: Author's analysis.

Next, we conduct a cointegration analysis to elaborate on the presence of the long-run relationship among examined variables using the Johansen procedure. The results of the cointegration test are in Table 3. The long-run equilibrium, which is indicated by a cointegrating relationship, exists if we find at least one cointegrating equation. The results reject the null hypotheses of none co-integrating relationship at 5 percent level. It implies the existence of one cointegrating equation in a set of the variables, including economic growth, inflation rate, tax ratio, government spending, broad money, and exchange rate. The presence of the co-integrating relationship indicates the long-run equilibrium among the variables. Such a relationship implies that the changes of the dependent variable are a function of the residual from the cointegration model. Overall, we may infer that price level, fiscal, and monetary variables support the economic growth sustainability in the long-run. Meanwhile, the

broad money variable is neutral. The only exchange rate does not support economic growth sustainability in the long period.

4.3. Empirical VECM estimates and economic growth sustainability

We present the empirical model based on vector error correction model (VECM), which covers five equations. The model captures the dynamic response of the dependent variable toward explanatory variables which indicate the short-run behavior. This study concerns the sustainability of economic growth by estimating a set of variables including economic growth, inflation rate, tax ratio, government spending, and exchange rate. Even though estimation results using VECM provides five equations, our discussion only focuses on the economic growth model. According to the Akaike information criterion, we find the empirical VECM estimation with one lag. The coefficient of error correction term (ECT), which indicates the validity of VECM is statistically significant at the 0.05 level except for broad money model. This coefficient also indicates the presence of a long-run equilibrium relationship between each dependent variable and its explanatory variables. The coefficient of the error-correction term for economic growth model is -0.477 indicating the moderate response of economic growth to the deviations from its long-run equilibrium.

Table 4. Results of VECM Estimation

Independent Variables	Dependent Variables					
	ΔEconomic Growth	ΔInflation Rate	ΔTax Ratio	ΔGovernment Spending	ΔBroad Money	ΔExchange Rate
Constant	0.104 [0.20]	-0.594 [-0.33]	0.247 [1.49]	0.291 [1.33]	18.389 [1.22]	119.50 [0.73]
ΔEconomic Growth(-1)	0.465 [1.93]*	0.438 [1.32]	-0.221 [-2.75]***	-0.152 [-1.44]	-0.091 [-0.012]	-256.32 [-2.28]***
ΔInflation Rate(-1)	-0.135 [-1.96]**	-0.141 [-0.82]	-0.005 [-0.32]	-0.029 [-1.37]	-1.123 [-0.77]	89.376 [5.70]***
ΔTax Ratio(-1)	-0.079 [-0.16]	-1.404 [-0.79]	0.157 [0.95]	0.272 [1.24]	-14.927 [-1.00]	-186.73 [-1.16]
ΔGovernment Spending(-1)	-0.440 [-1.03]	4.681 [3.09]***	0.039 [0.28]	-0.069 [-0.36]	7.788 [0.60]	446.85 [3.23]***
ΔBroad Money(-1)	0.0003 [0.13]	-0.0007 [-0.08]	-0.0004 [-0.52]	-0.0001 [-0.10]	0.902 [11.92]***	1.735 [2.12]**
ΔExchange Rate(-1)	0.0004 [2.11]***	-0.001 [-2.35]**	0.00013 [0.18]	-0.0005 [-0.72]	-0.001 [-0.23]	-0.398 [-5.64]***
Error Correction term	-0.477 [-4.70]***	0.603 [1.83]*	-0.328 [-3.37]***	0.231 [1.67]*	5.753 [0.60]	-358.16 [-3.51]***
R-squared	0.629	0.452	0.106	0.204	0.792	0.873
F-statistic	9.239	4.494	0.648	1.397	20.776	37.585
Akaike IC	4.929	7.469	2.732	3.290	11.737	16.496

Note: Values in the [ ] are t-statistic. ***, **, and * and indicate significant at 1%, 5%, and 10% level. The optimum lag length based on the Akaike Information Criterion (AIC).
Source: Author's analysis

Focusing on the economic growth model, two explanatory variables, namely the inflation rate and exchange rate, are statistically significant. It implies that the inflation rate hurts economic growth. The negative effect of inflation rate on economic growth implies that higher inflation reduces economic growth. This finding is in line with some recent studies (Akinsola & Odhiambo, 2017; Barro, 2013; Bukhari & Yusof, 2014). We may infer that the price level is not neutral to the economy in the short-run. The price level significantly eliminates real income. Therefore, a high inflation rate did not support economic growth sustainability.

Moreover, the exchange rate has a positive impact on economic growth, implying that the depreciation of the Indonesian currency causes lower economic growth. This finding is similar to previous studies (Karras, 2011; Mahmoodi & Mahmoodi, 2016). These results reflect that the international financial market assault economic growth sustainability. The globalization and trade liberalization, which has an impact on Indonesian currency depreciation, potentially reduce the real income. The central government should avoid capital outflow to minimize the depreciation of the domestic currency against international currencies.

We may further discuss the sustainability of economic growth based on the VECM empirical model by elaborating the role of other variables such as tax ratio, government spending, and broad money. Table 5 summarizes the effects of examined variables on economic growth sustainability. The effect of the tax ratio on economic growth is not significant, indicating that higher tax ratio does not increase the economic growth. Meanwhile, the increase of economic growth significantly causes lower tax ratio. These results show that the tax ratio is not an important factor for economic growth. Therefore tax ratio is neutral to the economic growth sustainability. In other words, we may state that the tax ratio is neutral to economic growth sustainability.

The other fiscal variable, which is indicated by government spending, does not significantly affect economic growth. Otherwise, higher economic growth also did not increase government spending. This phenomenon exhibits a weak relationship between fiscal policy and economic growth. This result is not in line with some previous studies (Bošnjak, 2018; Butkiewicz & Yanikkaya, 2011; Tsaurai & Odhiambo, 2013). We may infer that the government spending is neutral to the sustainability to the economic growth in the short-run. The Indonesian fiscal authority should reform government spending to maintain economic growth sustainability in the future.

Table 5. The effect of independent variables on economic growth sustainability

Independent Variables	Implication on Economic Growth Sustainability	
	Long-run effect	Short-run effect
Inflation rate	Positively affect sustainability	Negatively affect sustainability
Tax ratio	Positively affect sustainability	Neutral
Government spending	Positively affect sustainability	Neutral
Broad money	Neutral	Neutral
Exchange rate	Negatively affect sustainability	Negatively affect sustainability

Source: The summary is based on the results of Table 3 and Table 4.

The relationship between broad money and economic growth is not significant. Therefore, this paper confirms that money is neutral in the economy. This point of view is in line with the Keynesian theory, which states that the monetary policy is powerless in the economy. The broad money variable as the main instrument of monetary policy is also neutral to economic growth sustainability. Based on the empirical estimation, the broad money is not significant. Meanwhile, higher economic growth did not increase the broad money variable. We may conclude that the relationship between the monetary sector and economic growth should be strengthened to encourage economic growth sustainability.

5.   Conclusion

This research elaborates economic growth sustainability based on the dynamic econometric models. We utilize cointegration and vector error correction model to estimate the dynamic relationship between economic growth and other selected variables such as inflation rate, tax ratio, government spending, broad money, and exchange rate in Indonesia. We find the presence of a long-run relationship between economic growth and all the mentioned variables. In other words, the dynamic changes of those selected variables will affect the economic growth in the future. The empirical model based on VECM estimation shows that only inflation rate and exchange rate significantly affect the economic growth. Therefore, those two variables determine economic growth in the short-run. We may infer that economic growth depends on price stability and external factors such as the international money market.

This paper presents that the price stabilization, fiscal and monetary policies, and exchange rate have a long-run impact on economic growth sustainability. In the short-run only price level and exchange rate associated with economic growth sustainability. However, those both variables do not support the economic growth sustainability in the short-run. Unlike those variables, inflation rate, tax ratio, and government spending have a positive impact on economic sustainability in the long-run. Specifically, we may conclude that economic growth sustainability in Indonesia positively associates with fiscal policies. The exchange rate variable does not support economic growth sustainability both in long and short-run. The inflation rate has a positive relationship with economic growth sustainability in the long run. Otherwise, it does not support economic growth sustainability in the short-run. We also highlight that the effect of monetary policy on economic growth sustainability is neutral both in the long and short-run.

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IMPLEMENTATION OF THE REPUBLICAN BUDGET AND ASSESSMENT OF AGRICULTURAL FINANCING: A CASE STUDY

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Abstract. This article discusses the results of implementation of the republican budget in the context of agricultural financing. The allocation of the necessary budget funds for the realization of the measures, which were taken into account by the State Program for the Development of the Agro-Industrial Complex of the Republic of Kazakhstan for 2017-2021, has been considered. The areas of financing and the level of utilization of budget funds in the framework of the program tasks for 2017 have been studied in detail. The results of using these funds in raising the level of food safety in the country have been assessed. Some problems in the development of the provision of domestic food products, in particular, dairy products, have been identified, and suggestions for their solution have been made.

Keywords: republican budget, local budget, budget implementation, state development programs, agricultural development, food security

1. Introduction

One of the main tasks of the state is to provide financial support as a condition for the existence and development of agriculture. Purposeful financial support ensures the sustainable development of the industry, without which it is impossible to guarantee the country's food security, to develop a competitive agricultural sector of the economy, to ensure the integrated development of rural areas or to solve social problems in rural areas (Assessment of the food security of the Republic of Kazakhstan, 2014). Sustainable agricultural development plays an important role in improving land use, helping to preserve and increase its productive power around the globe (Moumen et al. 2019; Shevyakova et al. 2019).

Self-sufficient agricultural industry is regarded as the very basis of the economic strength of any nation.

The main source of financial support is budget (republican and local) funds. The interest of the state in co-financing agriculture is due to the fact that it is significant for national economy (contribution to GDP, employment, natural resources), and especially as each country tends to ensure food security (Kuzman et al., 2017). Budget funds can be particularly allocated for the financing of the following programs: agricultural research; marketing organization; crediting; land conservation; support of prices, purchase, compensation payments; support of farming supply and marketing cooperatives, market orders; subsidizing food; export subsidies; international food aid.

The purpose of this article is to compare the republican budget of 2017 and 2016 in order to identify the level of financing of budget programs in the field of the agro-industrial complex (Report of the Government of the Republic of Kazakhstan, 2018). Analysis of research work makes it possible to note that the current globalization processes raise new questions from the point of view of theoretical, methodical and practical understanding of the areas and results of agricultural financing (Kudryavtsev, 2009; Polonskiy, 2010; Popova & Sidorin, 2015; Martynova & Evarovich, 2018).

At the same time, excessive state intervention in the field of agriculture can lead to serious imbalances and negative impact on the efficiency of the agricultural sector. Under these conditions, it is necessary to find the optimal interaction mechanism between the use of free market relations and state intervention in the field of agriculture.

One of the interaction mechanisms can be the development and use of targeted programs and projects in priority sectors of the agrarian economy with the justification of the amount of financing. An example of the implementation of such a mechanism is the implementation of the State Program for the Development of the Agro-Industrial Complex for 2017-2021, approved by the Decree of the President of the Republic of Kazakhstan on February 14, 2017. This program complemented and developed the previous program "Agribusiness-2020". In the new program, the total cost in 2017-2021 should be 2.4 trillion tenge, which is slightly less compared to "Agribusiness-2020", where it was planned to allocate 2.8 trillion tenge for expenses in 2017-2020 (State Program, 2017).

The implementation of this and other programs cannot be considered in isolation from the study of the level of state support. Such an approach to the study of the development of the agro-industrial complex is being widely discussed, since it has a great scientific and practical interest. In this article, we put the question in a slightly different way, namely, we consider the state support of programs for the development of the agro-industrial complex on the basis of their interrelation with the implementation of the republican budget. We will also try to assess the possibilities of financing projects that are planned in this program. We can see that huge budget funds are to be allocated for state support. The question now is, first of all, how effectively these funds are used, what their returns are, and how effective the financial mechanism for regulating and stimulating agricultural production is.

For this purpose, in this article we try to assess the results of the above-mentioned development program, which has been implemented in the Republic of Kazakhstan since 2017. As the program plans to finance specific targets for agricultural development, the task of the study is to assess the financing of state targeted programs in the agricultural sector and to analyze trends in the provision of state financial support for the country's sustainable agricultural development.

2. Materials and Methods

The methodology of the study was based on the methods of calculating the dynamics indicators characterizing the republican budget data and data on financing development programs, as well as on a comparative analysis. In order to achieve the objectives, we used specific data from the republican budget in terms of financing in accordance with the implementation of the above-mentioned program in 2017. In order to analyze and assess the results of the program implementation, we used the methods of comparing the calculated levels of dynamics according to the republican budget and data on the amount of financing for development programs through budget funds.

3. Results and Discussion

State financial support for agricultural producers in the Republic of Kazakhstan is provided in the form of subsidies, concessional lending and tax incentives. In this regard, it is of interest to conduct a comparative analysis of financing and lending, by highlighting the areas of financial support for agricultural producers, provided by the state in order to increase the competitiveness of agricultural products. Such an analysis makes it possible to assess how state subsidies, short-term and long-term credits of commercial banks as well as loans of non-banking institutions contributed to an increase in the production and sales of agricultural products, and improved the financial performance of the company.

A literature review on the research question allows us to state that there are different points of view on the issues under consideration, but the common denominator is that, in general opinion, all state programs for agricultural development should have financial support from the budget.

We agree with the opinion of those authors who note that the financing of such expenses as on agricultural research, education and infrastructure contributes to the growth of labor productivity and the development of agricultural production. Investing in agricultural infrastructure has a significant impact on the state of poverty in rural areas, since there is a complex development of rural areas that leads to economic growth and poverty reduction (Utibayev et al., 2017; Utibayeva et al., 2016; Clark, Menifield & Stewart, 2018).

The republican budget approved for 2017-2019 preserved a conservative approach to planning priority expenses, which is based on the forecast of socio-economic development, basic expenses of the previous period, the results of budget monitoring and the assessment of budget implementation. At the same time, the developed three-year budget is more focused on the realization of state and sectoral programs, which define the actual timeline for project implementation (State Program, 2017).

However, it should be noted that in the forecasts there is a slight decrease in the volume of state subsidies provided for the development of crop production, as well as their low size, directed to the development of the livestock industry. Such an approach, in our opinion, will not contribute to the stable growth of agricultural production in the medium term.

Some results of the development of the country's agricultural sector indicate that over the past five years, agricultural production has increased 1.4-fold (from 2,949.5 billion tenge to 4,097.5 billion tenge), and processing volumes have increased 1.5-fold (from 970.1 billion tenge to 1,478.4 billion tenge). Over the years, there has been an increase in the level of labor productivity in the agro-industrial complex, with an average annual growth rate of almost 24%. Over the same years, 4.4 billion US dollars was allocated to the agricultural sector, of which more than 80% was from the private sector, which indicates an increase in the attractiveness of this sector for business development.

Any state program or project, first of all, must have financing sources. The above-mentioned state program for the development of the agro-industrial complex also has clearly indicated financing sources and amounts. It should be noted that more than half of the expenses envisaged will be financed from the republican budget. For the entire implementation period of this program, as mentioned above, about 2.4 trillion tenge is needed, of which the share of the republican budget accounts for slightly more than 1.2 trillion tenge, the share of local budgets – 0.9 trillion tenge, and the rest will be financed from other sources. In addition, the annual financing amounts will be adjusted in accordance with the budget parameters.

It should also be pointed out that in the approved republican budget for 2017-2019, in general, there are positive forecasts of financing costs. However, according to the forecast volume of budget expenses, provided for by the functional group "Agriculture and related industries", there is an incomprehensible decrease in the amount of financing costs for this functional group. While in 2017 it was planned to allocate 167,136.7 million tenge for this group and in 2018 – 160,042.4 million tenge, in 2019 these amounts decreased to 153,948.4 million tenge. In this case, we can note that the share of costs is about 2% of the level of all costs. This level, in our opinion, does not correspond to the goals, objectives and directions that are provided for by the state development program of the agro-industrial complex for 2017-2021. Moreover, the amount of 167.1 billion tenge, planned for 2017, is not linked to the expenses envisaged for this year. In this regard, during this year it was necessary to allocate more than 359 billion tenge for the implementation of this program, of which only 198 billion tenge being from the republican budget, 144.5 billion tenge – from local budgets, and the rest – from other sources, for example, attracting loans from commercial structures (Utibayev et al., 2017).

Consider the implementation of the republican budget in terms of financing in accordance with the State Program for the Development of the Agro-Industrial Complex of the Republic of Kazakhstan for 2017-2021 (henceforth referred to as the Program) (2017). The main goal of this Program is to ensure the production of high-demand competitive agricultural products. At the same time, it is planned to achieve results by target indicators.

Focusing on the demand for agricultural products involves, above all, the production of certain priority goods and food products that are necessary to meet the needs of the domestic market in terms of food security, as well as the development of the export potential of the agro-industrial complex. The latter is impossible without increasing the competitiveness of products, which involves resolving resource supply issues, developing infrastructure and implementing a stimulating state policy in the agro-industrial complex.

It should be noted that the Program for meeting domestic food needs specifically identifies priority agricultural products for which production needs to be developed. These include poultry meat, meat products, dairy products, fish, vegetable oil, fruits and vegetables, and sugar. At the same time, the Program provides for an annual decline in imports of agricultural products. For example, in 2018, the volume of imports of food products should be 96.2% of the 2015 level, in 2019 – 86.7%, etc.

With regard to the development of export potential, the Program notes that, first of all, it concerns those types of products whose domestic consumption is currently fully provided by domestic production, and those that are in high demand in foreign markets. These include beef, lamb, pork, corn, oilseeds, potatoes and their processed products, as well as organic products (State Program, 2017).

In 2017, the budget allocated 387,295 million tenge for financing its implementation, of which 243,747.4 million tenge was from the republican budget, including in the form of targeted transfers to the regions in the amount of 115,951 million tenge, and 143,547.6 million tenge – from the local budget. The amounts are impressive, and the degree of their utilization is of practical interest from the point of view of both their actual utilization and the results achieved by the planned tasks.

Table 1. Financing of agricultural development programs

Financing of planned tasks	2017		
	plan (mln tenge)	actual (mln tenge)	in % to plan
1. Saturation of the domestic market and development of the export potential of domestic products	234 532,7	234 424,3	99,9
2. Efficient use of state financial measures	110 622,9	110 585,4	99,9
3. Efficient use of water resources	37 951,7	36 781,6	96,9
4. Creation of conditions for the efficient use of land resources	3 700,3	3 700,3	100
5. Scientific-technological, personnel and information-marketing support of the agro-industrial complex	460,8	460,7	100
Total	387 268,4	385 952,3	99,7

Source: Compiled by the authors based on the Report of the Government of the Republic of Kazakhstan (2018)

The data given in Table 1 testify to the almost 100% utilization of the allocated budget funds. Nevertheless, we will try to assess which areas were covered by various types of financing and what was done specifically as a result of the utilization of the allocated funds.

Table 1 shows the data on three more important areas of financing tasks, namely, on the efficient use of water resources, on creating conditions for the efficient use of land resources, and on scientific-technological, personnel and information-marketing support of the agro-industrial complex. These areas are certainly significant and deserve close study, which is impossible in the framework of a single article. Therefore, we will dwell in more detail on the assessment of the results achieved by the first two tasks.

Consider in more detail the areas of financing for the implementation of the first task – the saturation of the domestic market and the development of the export potential of domestic products. Subsidizing at the expense of the local budget was carried out with the aim of increasing the yield and quality of crop production, as well as the cost of fuels and lubricants and other inventory values necessary for spring fieldwork and harvesting, by subsidizing the production of priority crops. Moreover, the payment of subsidies was carried out only in case of sowing on arable land, as well as on the reimbursement of the cost of growing crops in protected ground, the cost of laying and growing, including the restoration of perennial plantations of fruit and berry crops and grapes and other types of agricultural work.

As can be seen from the data in Table 1, more than 234.4 billion tenge was allocated and spent on the implementation of this task, which is 60.7% of all funds. Of these, 95,805.5 million tenge, or 41%, were funds from the republican budget. They were used to subsidize significant and priority areas. A significant amount of these funds was allocated for the annual lending of spring fieldwork and harvesting by agro-industrial entities. In 2017, 60 billion tenge was allocated and spent for these purposes, which, along with a reduction in the rate of remuneration, allowed financing 1,816 agro-industrial entities, while covering 3 million hectares (Report of the Government of the Republic of Kazakhstan, 2018).

It is necessary to note the importance of carrying out phytosanitary measures and measures on plant quarantine against highly dangerous pests and quarantine objects, since significant amounts are provided for these purposes at the state level annually. For example, in 2017, more than 4.8 billion tenge was allocated and spent on financing chemical treatments of more than 4 million hectares of agricultural areas against highly dangerous pests.

At the same time, currently, at the expense of local budgets, herbicides, bioagents and biological products intended for processing crops in order to protect plants are subsidized. For these purposes as well as for

subsidizing the costs of combating harmful, highly dangerous pests above the economic threshold of damage, quarantine objects and weeds, more than 26,270.6 million tenge was allocated and spent from the local budget.

In the structure of financing the development of the livestock industry, one should single out, first of all, the subsidizing of the cost of developing livestock breeding as well as increasing the productivity and quality of livestock products. For these purposes, 8,902.8 million tenge was allocated and spent from the republican budget. In total, 74,009.8 million tenge was allocated, of which 65,106.9 million tenge was allocated from local budgets.

Another rather large, in terms of financing, area is subsidizing the conduct of diagnostic studies of animal diseases and reference studies in veterinary medicine, the timely identification, localization and rehabilitation of foci of infection for highly dangerous animal diseases, as well as the acquisition of products for the identification of farm animals and the provision of veterinary drugs against highly dangerous animal diseases.

The total amount of funds allocated and spent for these purposes from the republican budget amounted to more than 20,875.7 million tenge. According to the reporting data for 2017, 133 foci of highly dangerous diseases were eliminated, 129 unfavorable points were improved, and 178.88 million doses of veterinary drugs were purchased.

Sufficiently large amounts from the republican budget, about 260 million tenge, were allocated and spent on monitoring food products regulated by the state veterinary and sanitary control and supervision service, which made it possible to conduct 21,332 studies. The costs of processing enterprises for the purchase of raw materials to produce powdered milk, butter and cheese in the amount of 2,869.8 million tenge were subsidized at the expense of local budgets. In this regard, 87 milk processing enterprises received subsidies.

In addition, 474,247 thousand tenge was allocated from the republican budget to procurement organizations in the agro-industrial sector for subsidizing the amount paid to the budget within the limits of the calculated value-added tax. 28 procurement organizations received subsidies.

Ensuring the country's food security cannot be considered in isolation from the financial assistance provided by the state to agricultural producers. According to Table 1, the amount of financial measures of state support is more than 110.6 billion tenge, or more than 28%. As a result, the index of physical volume of investments in fixed assets in agriculture amounted to 1,902 compared to the level of 2015, or investments increased by 90.2%. In addition, significant growth was observed in investments in fixed assets in food production – 1,593 to the level of 2015.

The main measures of state support include the following areas of financing. The largest share is accounted for by subsidizing the reimbursement of a part of the expenses incurred by the subjects of the agro-industrial complex with investments. More than 76,224.9 million tenge was allocated and spent from the republican budget for these purposes. At the same time, 7,532 applications of investors in 21 priority areas of the agro-industrial complex were subsidized.

Another area of financing is the subsidization of interest rates for reducing the principal debt of agricultural producers, participants of the subsidy program; more than 15,609 million tenge was allocated and spent from the republican budget for this purpose. About 14 billion tenge was allocated and spent on subsidizing interest rates on loan and leasing obligations in the framework of the financial recovery of agro-industrial entities.

In this regard, it should be noted that in order to increase the availability of financing for agro-industrial entities, this program plans to gradually reduce inefficient subsidies that directly distort pricing and are referred by the WTO to the "yellow" basket. These should include commodity-specific subsidies distorting the market (per unit of area, per unit of production). The funds released as a result of such measures are to be used in the form of such

financial instruments as subsidizing the interest rate on loans, leasing agricultural machinery and livestock; investment subsidizing; insurance subsidizing; development of a system of credit partnerships and loan guarantee institutions. For example, for investment program participants (development of beef farming, intensive farming, intensive gardening, etc.), the rate of credit and leasing will not exceed 4% per annum in tenge, and the loan terms will be extended to 15 years. At the same time, program participants will not receive commodity-specific subsidies from the time of concessional lending (State Program, 2017).

Conclusions

It can be stated that the amounts of the republican budget implementation in terms of financing the development programs of the country's agro-industrial complex were almost completely utilized. With few exceptions, a fairly large amount of funds from local budgets was utilized. All these funds were used to subsidize those tasks that were provided by the State Program for the Development of the Agro-Industrial Complex (2017).

As a result of the utilization of the allocated funds, the target indicators planned for 2017 were achieved. Thus, the index of physical volume of agricultural gross output (services) was 1.080 compared with the 2015 level, and the index of labor productivity was 1.270, while it was planned to achieve the level of 1.120. It was also planned to achieve the volume of exports of food products in the amount of 920 million US dollars, while the actual volume amounted to 1,202.5 million US dollars. Compared with the 2015 level, there was a decrease in the index of physical volume of the wholesale trade in food products – 0.798, although it was planned to amount to 1.06. For comparison, the values of the price index for food products over time are as follows: 2015 – 1.071, 2016 – 1.138, 2017 – 1.061.

Nevertheless, the volume of food production increased by 3.8% and exceeded 1.2 trillion tenge. At the same time, the production of cereals increased by 36%, sugar – by 49%, flour – by 13%, vegetable oil – by 14%, sausages and similar meat products – by 10%. 325.8 billion tenge was allocated and spent for these purposes.

In general, the total investment in agriculture increased from 148 billion tenge in 2016 to 228 billion tenge in 2017. This was contributed by the introduction of new regional projects to enhance the export potential of cattle meat, as well as the growth of investment subsidies and incentives for the introduction of cooperation in rural areas.

The development of cooperation in rural areas is one of the directions and main reserves of forming raw materials and food resources for the regional market of agricultural products with the participation of personal subsidiary farms. For example, according to FAOSTAT, cow milk production in Kazakhstan is about 5 million tons per year. At the same time, 80% of raw milk is produced on personal subsidiary farms. Only one third of this volume goes to industrial processing (Ishekenova, 2016). Personal subsidiary farms are organized in cooperatives for the production, processing, marketing, and storage of agricultural products, aquaculture products (fish farming), as well as services associated with the maintenance of members and associate members of the cooperative.

As of April 1, 2018, according to statistics, there were 2,849 registered cooperatives, which involved more than 62 thousand persons. However, audits of state bodies revealed a number of systemic problems that in one way or another hinder the effective development of agricultural cooperation. In particular, 18% of created cooperatives were inactive, and 42% were formally created cooperatives. That is, only 40% of cooperatives were more or less functioning, and they faced problems with processing and marketing products produced by the members of cooperatives. There was also the lack of sufficient measures to stimulate the development of cooperatives, and the lack of agricultural land in some regions.

In general, the development of agricultural cooperation would help to solve such key problems of the agro-industrial complex as:

- low level of labor productivity;
- low level of product competitiveness;
- underutilization of processing enterprises;
- low technical equipment;
- low profitability of product sales;
- high overhead costs.

We believe that for the development of agricultural cooperation it is necessary:

- to create equal conditions for subsidizing agricultural cooperatives in all available measures of state financial support;
- not to make plans for the creation of cooperatives for akimats;
- to revise the conditions for granting microcredits for agricultural cooperatives.

In this regard, the State Program for the Development of the Agro-Industrial Complex for 2017–2021 provides for two mechanisms of cooperation of organized farms as key tools for increasing production efficiency – horizontal cooperation and vertical (anchor) cooperation. It is believed that horizontal cooperation will allow small and medium-sized agricultural producers to increase profitability by merging and reducing costs in the manufacture and sale of products. Vertical cooperation ensures integration for agricultural producers and creates economically advantageous conditions for their interaction with both processing enterprises and other consumers, on the one hand, and with suppliers of resources necessary for production, on the other. At the same time, personal subsidiary farms can participate in cooperation as business entities in the form of individual entrepreneurs, and peasant farms. In order to obtain state support, starting from 2020, agricultural producers that are not registered as legal entities must be members of vertical cooperation or horizontal cooperation (State Program, 2017).

Furthermore, there is a need to introduce digitalization elements, for example, to create a special portal with automated information gathering and monitoring of data on agricultural units in order to assess performance, to account for jobs, and to analyze labor productivity.

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ENVIRONMENTAL INVESTMENT: THE MOST ADEQUATE NEO-INDUSTRIAL RESPONSE TO THE GROWTH DILEMMA OF THE ECONOMY

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Abstract. The article justifies the mission of environmental investment in the context of the neo-industrial paradigm of modern development. This approach considers socio-economic development in its organic connection with the environment (the green lifestyle). Environmental investment involves solving the complex growth dilemma of the economy by reducing the negative impacts of the latter on the environment and introducing positive social changes. The authors determined the role of this process in the neo-industrial aspect of economic growth. The goal of this research is to prove the hypothesis of the interinfluence between environmental investment and economic growth. The authors built a multi-factor regression model to analyze the data, which showed a statistically significant relationship between environmental investment and Russia's GDP growth during 2000–2017. This led to the conclusion that the tightening of environmental policies in Russia is accompanied by not a decrease but an increase in the real GDP. On the basis of tree clustering and k-means clustering, the authors classified the regions of Russia and found that the high level of air pollution is not always accompanied by an increase in investment in environmental protection and three atypical clusters were identified. Moreover, the authors identified the main factors hindering environmental investment in the modern Russian economy, as well as determined the main conditions for its enhancement, which will increase the country's potential for economic growth in the long run, considering its neo-industrial accumulation.

Keywords: growth dilemma; neo-industrial paradigm of modern development; environmental investment; green (circular) economy; neo-industrial type of economic growth

1. Introduction

Environmental issues are currently the most acute of global problems. They constitute a wide range of phenomena threatening human life and health (increasing carbon dioxide emissions to the atmosphere that lead to climate change, reduction of biodiversity and fresh water, and soil degradation, among others), as well as the depletion of the natural resources required for economic growth. It is no coincidence that back in 1972, when, due to rapid economic and demographic growth, the needs of mankind began to exceed the capabilities of our planet, in the first report of the Club of Rome "Limits to Growth" (Meadows et al., 1972) the attention of the scientific community was drawn to the issue of environmental constraints on economic growth: it "was considered the global one" (Gubanov, 2014). In all countries the beginning of the 21st century was marked by extreme manifestations of the above-mentioned global environmental challenges. For instance, as indicated in the World Bank Report (2014), the temperature of the Earth's atmosphere has risen by almost 1.50 °C compared to the pre-industrial era and is approaching the threshold value of dangerous anthropogenic climate change that equals 2.00 °C. At this point "it will be more difficult to solve socio-economic problems due to the drop in crop yields, changes in the water cycle, pollution of water sources, and the increased number of tsunamis, typhoons, floods and pandemics" (Gubanov, 2014). In 1999, according to the German Federal Institute for Geosciences and Natural Resources (BGR), the value of "environmental debt" was estimated to be 20%, whereas the Earth's population now consumes 1.5 times more resources than nature can reproduce in a year (Lipina, 2018). Scientists' calculations show that, if the per capita consumption of the BRICS countries alone equals that of the USA, the natural resources of five planets like the Earth will be required (Meadows et al., 2005; Spence, 2011).

Experts estimate that there are global reserves of energy resources for the next 40–50 years (more than 100 years for coal). But, for many types of mineral raw materials, this figure ranges from 10–20 years. At the same time, only 2% of the total fossil resources extracted in the world are used, whereas 98% of them go to waste (Kamenik, 2015; Lipina, 2018). In addition to environmental pollution, the increase in the volumes of accumulated unutilized production and consumption wastes is accompanied by the exclusion of large quantities of valuable raw materials from economic circulation (Malysheva, 2013).

Considering the above, the environmental aspect of people's lifestyles that is connected to the consumption of natural resources becomes "a truly imperative" issue (Gubanov, 2012).

In this context, one of the most paradoxical features of the global financial and economic crisis of 2008–2009 was total agreement (involving the IMF, the United Nations Environment Program (UNEP), and various political parties) on the need for further economic growth in different countries, including developed economies. For instance, German politician and publicist R. Fücks gives the following arguments for national economic growth: "From an environmental point of view, zero growth is meaningless, from the economic and socio-political perspective, it causes a lot of difficulties: capital outflow, emigration of active citizens, declining innovation, and increasingly serious problems in the pension and health care system" (Fücks, 2016, p.104).

This leads to a very difficult dilemma: on the one hand, the continuing economic growth (in its present form) means the fragile environment, and on the other, it is a prerequisite for sustainable socio-economic development and prosperity of the country in the long-term (Jackson, 2011; Grigoriev, 2014; Balynskaya & Ponomarev, 2018). It is extremely important to solve this "impossibility theorem" (Ayres, 2008), which actually involves finding new models, sources, factors, drivers and foundations of economic growth, as well as the discussion about the outline of a new macroeconomic investment strategy that should be environmentally and socially smart and focused on launching new "engines" of economic growth.

Considering all the above, there is a growing need for fundamental and proactive environmental investment, capable of reversing anti-sustainable trends in the use of natural resources and environmental degradation to "begin the transformation of the economy of the 21st century" (Jackson, 2011).

2. The importance of the problem

As noted above, the interest in the growth dilemma, or in other words, the issue of environmental constraints on economic growth and sustainable development first formulated in the 1970s, does not become less serious today. Contrarily, it involves a higher level of research reflecting the new aspects of the interaction of economy, society, and the environment. In 2012, at the United Nations Conference on Sustainable Development, also known as "Rio+20", most countries agreed that economic development in its current form leads to rapid accumulation of physical and human capital, but is followed by excessive depletion and degradation of natural capital. What is more, this conference largely facilitated spreading the UNEP's idea of the green economy (2008) that reflected a new UN initiative—the so-called global new green course. The latter combines the focus on socio-economic development and the preservation of the environment (including climate) through the priority development of ecological growth niches and the use of the latest environmentally friendly technologies (Yakovlev et al., 2017; Baltgailis, 2019). It should be mentioned that after the concept of sustainable development was introduced, a new investment model emerged: the sustainable or responsible investment officially stated at the UN Summit on Sustainable Development in 2015. Such investment focuses not only on investor income, but also on reducing the negative impact of the economy on the environment, creating positive social change, and compliance with ethical standards (Perry, 2015; Fontana & Sawyer, 2016). Additionally, it meets the principles of humanistic development and inclusive society, adequate to the role and importance of social capital.

Evidently, as a member of the UN, the Russian Federation must follow the same course. For Russia, solving the difficult growth dilemma is complicated by the fact that the post-Soviet domestic system of social reproduction was downgraded to the raw export model, and the country, to deindustrialization and a raw material colony of foreign TNCs (Gubanov, 2014; Daskovsky & Kiselev, 2016). This situation predetermines the fundamental problems of the Russian economy, including environmental ones, which manifest themselves in significant losses of natural and labor potentials and diminish the prospects for sustainable development.

Under these conditions, it is impossible for Russia to solve the growth dilemma and set a course on sustainable development without changing the model of the national economy from raw export to new industrialization associated with digital, high-tech, and technotronic updates, the social result of which implies laying the foundations for a new society focused on human reproduction and the healthy environment, not profit (Gubanov, 2012).

The new economic paradigm created by the Russian economic school in the 2000s is based on the fundamental natural and social laws and means reaching the technotronic level of productive forces development. It "does not oppose the economy and nature, nor does it increase the gap between them, but it unites them, transforming into the consistent whole" (Gubanov, 2014).

According to the authors of the article, this approach is the only way to initiate a long period of new economic growth, the main criteria of which are innovation, environmental friendliness (weak sustainability), and inclusiveness (Kormishkina et al., 2016). Environmental investment should become the key driver of new economic growth. Obviously, the goals of such investment will differ from that of traditional capital investments (increasing labor productivity). Ecological investments should be oriented toward transformation of the current economy into a green (circular) one, and toward achieving strong sustainability (Arkhipov et al., 2018; Ghani et al., 2019; Aziz et al., 2019).

3. Literature review

In recent decades, many leading international and Russian scientists and experts substantiated the need for changing the current (nature-depleting) economic development. They proposed a new paradigm opposing the "anti-sustainable" economic trends associated with underestimation of environmental and raw material factors. This new paradigm is aimed at "overcoming growth limits" (Meadows et al., 2005) and solving the complex growth dilemma" (Grigoriev, 2014; Jackson & Anderson, 2009; Spence, 2011). Various definitions were given to the new type of development: "postindustrial economy" (D. Bell, E. Toffler), "knowledge-based economy" (P.M. Romer, E. Weizsäcker, A. Lovins, L. Lovins, N.I. Ivanova, O. Golichenko), "Digital Housekeeper" (K. Shvab, A.V. Keshelava, V.G. Budanov, V.Yu. Rumyantsev), and "Environmentally Sustainable Development" (N. Kasimov, Y. Mazurov, A.D. Ursul). Within these theoretical approaches, researchers develop numerous indicators and aggregated indices to reflect the value of natural capital and the state of the environment. However, experts have not yet proposed a generally accepted methodology allowing adequate assessment of the "anti-sustainable" trends in socio-economic and environmental development.

By the beginning of the global financial and economic crisis of 2008–2009, the discussion on the environmental constraints on economic growth and the growth dilemma has already escalated into a heated argument over two interrelated environmental problems affecting the intensity of economic activity — climate change and energy security (or the so-called "oil peak"). The New Green Course (2008) that appeared because of this dispute is based on the classic Keynesian program of public spending (Keynes, 2016 (1936 1sted.)). In addition, there was the New Deal, proposed by F.D. Roosevelt in 1930, and the idea of changing the "engine of growth" (Ayres, 2008; Jacobs, 1991). This project was not only quickly recognized among scholars and politicians (Krugman, 2009; Jackson, 2009; Fücks, 2016; Bobylev & Zakharov, 2012; Porfiryev, 2013; Lipina, 2018), but also received strong international support (UNEP Global Green New Deal Program, 2009).

Due to the growth dilemma and stagnation of Russia's raw export model of the national economy, there is a growing interest in the neo-industrial paradigm of modern development created by the founder of The Economist magazine and editor-in-chief, professor S.S. Gubanov. His fundamental program was presented in the monograph "Mighty Breakthrough. Neo-Industrialization of Russia and Vertical Integration" (2012) and several articles. This theory is based on the well-known principles of humanistic development and the idea of an inclusive society in which social capital dominates over private capital (profit). The most important feature of the new industrialization, which is digital, high-tech and technotronic, is that it establishes the unity of socio-economic and environmental principles crucial for implementing green living standards and ensuring the circular functioning of the economy.

4. Stating the hypothesis

Since environmental constraints on economic growth manifest themselves globally, the environmental issues have become absolutely crucial. So, to solve the growth dilemma and overcome the "anti-sustainable" development trends of the country, it is necessary to make a transition from the traditional (nature-depleting) national economy model to the neo-industrial paradigm of modern development (Gubanov, 2012). This approach implies organic unity of social, economic and ecological development, well-being of man and the healthy environment, not profit. Within the new economic paradigm, environmental investment becomes the key factor in ensuring a new type of long term economic growth and reaching the "resolution" of the environmental problem.

5. Method

The authors tested the hypothesis about the influence of environmental investment on the growth of the Russian economy by building a multifactor regression model, which appears as follows:

$$rgdp = \alpha + \beta_1 \text{env} + \beta_2 i + \beta_3 \text{epsi}, \qquad (1)$$

where *rgdp* is the logarithm of the real GDP of the Russian Federation in 2011 prices (the explained variable);

env is the logarithm of real investment in fixed assets allocated for environmental protection and rational use of natural resources;

i is the logarithm of real investment in fixed assets minus environmental investment;

epsi is the index of compliance with environmental policy requirements (in this equation (1) *env, i* and *epsi* are the explanatory variables);

α and β are estimated parameters.

Before the regression analysis, the authors carried out a preliminary assessment of the multicollinearity of the variables in the model to exclude the variables that may have strong mutual influence. This approach is one of the prerequisites for using the method of least squares (MLS) to determine the optimal parameters of the indicated regression model (1).

The level of statistical significance in the study estimated $p = 0.05$. The decision on the adequacy of the model was made after analyzing the residuals using graphical (a frequency diagram, a normal-probability graph, a graph of predicted values and residuals, a graph of predicted values and actual data) and computational methods for studying residuals (estimation of asymmetry and kurtosis). The authors calculated the value of the Durbin-Watson statistic, which enabled to assess the autocorrelation in the model residues.

The study used cluster analysis based on the tree diagram and the k-means method. We based on Ward's method for estimating distances between clusters. This method uses variance analysis and minimizes the sum of squares for any two (hypothetical) clusters that can be formed at each step. In general, this method is very effective, but it tends to create small clusters, which is quite acceptable in our study. The k-means method consists in dividing m observations (from space) into k clusters and each case belongs to the closest cluster. We used Euclidean distance as a measure of proximity, and its minimization is carried out on the basis of minimizing the total quadratic deviation of cluster points from the centroids of these clusters.

The calculations were carried out in Statistica 12 software.

In this study, the authors used official statistics data from the website of the Federal State Statistics Service of the Russian Federation (Russian Statistical Year Books 2003-2017) for the period of 2000–2017 as well as the Environmental Policy Stringency Index. The analysis was based on the indicators included in the official statistical digests of the Russian Federation: GDP in comparable prices, fixed capital investments allocated for environment protection, rational use of natural resources at current prices, and fixed investment at current prices (total). The cost figures in nominal terms were adjusted using the GDP deflator for the respective years, and the authors took their logarithms to exclude exponential growth. To test the hypothesis about the delayed influence of environmental investments on output volumes, the authors also used the data with a 1-3 period shift, as well as

information on investments in fixed assets minus environmental investments, including that with a 1-2 period shift. The OECD provided the basis for estimating the values of the Environmental Policy Stringency Index – *epsi*, and the authors extrapolated the actual parameters of this index for 2016–2017.

The Environmental Policy Stringency Index used in the model allows comparing the stringency of environmental policies in different countries. The obligation to comply with the requirements reflects how strictly or vaguely the price for environmentally harmful behavior is determined and paid. Actual values of the index range from 0 to 6 (this number implies the strictest environmental policy). When calculating the index, the authors used 14 environmental policy instruments divided into 2 large groups: the market mechanisms (taxes on various types of emissions, emission quota systems and subsidized tariffs for green energy) and the non-market instruments (standards and government subsidies on R&D).

A preliminary correlation analysis revealed the multicollinearity of the current values of investments in fixed capital for its values in periods t–1 and t–2. Due to this and the fact that there was the highest value of the correlation coefficient between the actual value of the indicator and the logarithm of the real GDP (0.952) shifted over time, the authors excluded these data from further research and did not use them in the model.

6. Results

Within the neo-industrial paradigm of modern development, the transition from the traditional economy to the green (circular) one aimed at overcoming "anti-sustainable" environmental trends and preserving the growth potential of the economy is a huge challenge. First of all, this involves attracting large real investments, which should be spent not only on mastering new, high and technotronic production technologies, and the technological progress of labor tools and productive forces, but also on ensuring the well-being of man and the healthy environment (Gubanov, 2012, 2014; Fedotova, & Tabekina, 2013).

In this context, it becomes incredibly important to change the balance between consumption and investment in the economy (Jackson, 2009), and the share of accumulation of gross investment in GDP (Pogosov, 2014).

The analysis showed that the share of gross accumulation in Russia's GDP declined from 24% in 2017 to 23% in 2018 (Fig.1), and it corresponded to the level of the 1960–1970s, whereas according to experts, to reach the figure comparable to G7, it should estimate 35.8% of GDP (Pogosov, 2014). Such a value of this indicator is significantly lower than that in the countries demonstrating high rates of economic growth in the 2000s. For example, in China it reached 47.7%, in India – 35.7%, in Vietnam – 37.9% of GDP (Russia and Countries of the World, 2012). The current level of gross fixed capital formation in Russia is lower than in new industrial countries and the CIS countries (Table 1).
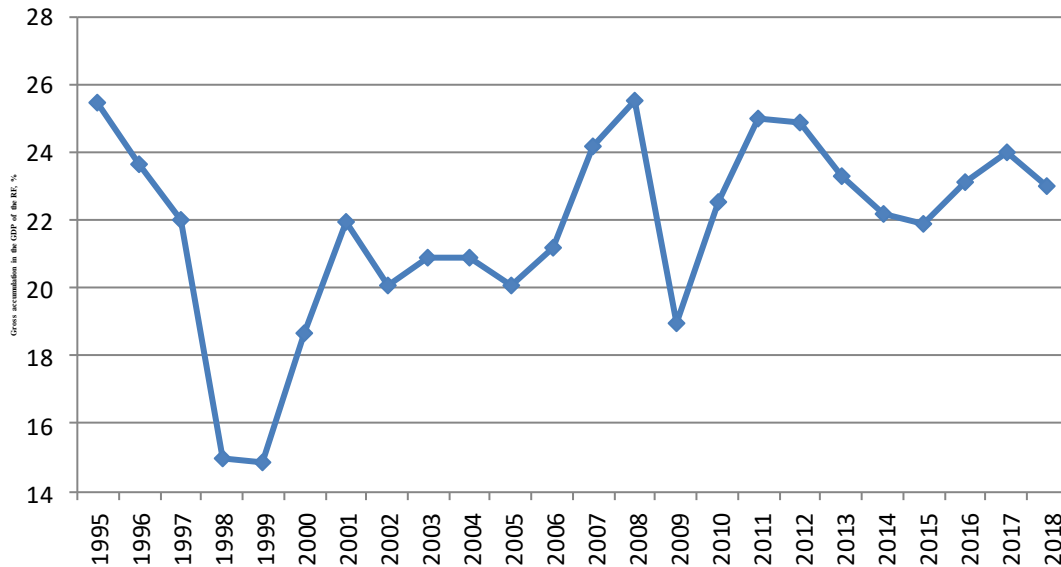
Fig. 1. Dynamics of the share of gross accumulation in the GDP of the Russian Federation in 1995–2018, % (Compiled using Russia in Figures, 2018)

Table 1. The gross accumulation rate in various countries and regions of the world (in % of GDP) in 2005–2016

Countries and regions of the world	Years										
	Average in 1989–1996	Average in 1997–2000	2005	2006	2007	2008	2009	2010	2011	2012	Average in 2012–2016
Developed countries	22.5	21.2	21.2	21.6	21.6	20.9	17.8	18.6	19.0	19.6	20.5
including newly industrialized countries of Asia*	32.5	27.3	26.1	26.4	26.1	27.7	23.4	26.2	26.7	26.9	26.7
Developing countries and transition economies	25.9	25.0	26.8	27.8	29.1	30.1	30.3	31.3	31.6	31.9	32.5
including Central and Eastern European countries	22.4	21.3	21.4	23.3	24.7	24.9	19.1	21.0	22.3	22.4	22.8
CIS countries	...	20.3	21.2	23.0	26.7	25.2	19.0	21.7	24.9	25.9	26.9
Latin American countries	20.1	20.7	20.5	21.7	22.5	23.8	20.1	21.8	22.4	22.9	23.5

Note: *South Korea, Singapore, Hong Kong, Taiwan. Data from World Economic Outlook (2018).

It is obvious that a constantly low share of gross investment in Russia's GDP hinders implementation of technological modernization and innovative transformations of the country's production potential. Therefore, this does not facilitate overcoming the "anti-sustainable" environmental trends in its development identified above and prevents solving the complex growth dilemma.

In the situation when the environmental aspect of people's life has become of paramount importance, environmental investment should play the key role in solving the growth dilemma. Considering the well-known

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and competing goals of these investments (reducing CO_2 emissions into the atmosphere, efficient use of natural resources, replacing non-renewable resources with renewable ones, changing the infrastructure of the economy, and restoring the integrity of ecosystems), it seems possible to define this concept as a specific type of economic resources (monetary and material investments) directed to:

- Improving the efficiency of resources use, which helps to save them (for example, efficient use of energy, waste reduction and recycling);

- Replacing traditional technologies with environmentally friendly or low-carbon ones operating in accordance with the principles of a closed resource cycle (for example, renewable energy sources, industrial reproduction of raw materials from waste);

- Improving the state of ecosystems and the quality of the environment (climate adaptation, planting forests, and renewing wetlands).

Within this approach, environmental investment meets the criteria for the neo-industrial type of economic growth determined by the authors of this article: innovation, sustainability (in the ecological sense), inclusiveness (Kormishkina et al., 2017). Innovations continue to play an important role (creation of environmentally friendly technologies, and recycling of resources). However, unlike traditional business technologies, they should be aimed not at increasing productivity, but toward achieving sustainability (as it was proposed by R. Hueting as early as in 1989). The active development of environmentally friendly technologies and recycling resources will ensure not only a big technological breakthrough, but also the creation of many new high-tech jobs, improving the quality of life, which also includes creating ecologically clean environment (in other words, implementing the principle of social inclusion).

All this makes it possible to conclude that environmental investments are socially responsible, or sustainable in a broad sense. Such investments can bring high returns to economic entities and meet their growing need for environmental protection systems, while society can preserve natural capital and improve ecosystems, energy independence and ensure transition to a circular (green) economy.

However, despite the indicated benefits from environmental investment, there are still some factors hindering this process, for instance: market imperfections in the field of ecology (the problem of so-called negative external effects and the effect of collective failure); slow development of the institutional and technological base due to investors doubts associated with the circular (green) economy; poorly developed competences in the financial sector.

Considering these factors and the high cost of environmental projects, attracting environmental investment to ensure economic growth remains the main challenge.

In this research, the authors assessed the influence of environmental investment on the dynamics of the Russian GDP in 2000–2017. For this purpose, the authors used the indicators characterizing environmental expenditures and investments of all institutional units in the field of environmental protection, including pollution by production and consumption wastes, as well as the indicators of rational use of natural resources.

By comparing GDP growth rates and investments in fixed assets aimed at environmental protection and rational use of natural resources, the authors could determine whether such capital investments were sufficient for neutralizing the growing anthropogenic impact on the environment (Fig. 2).
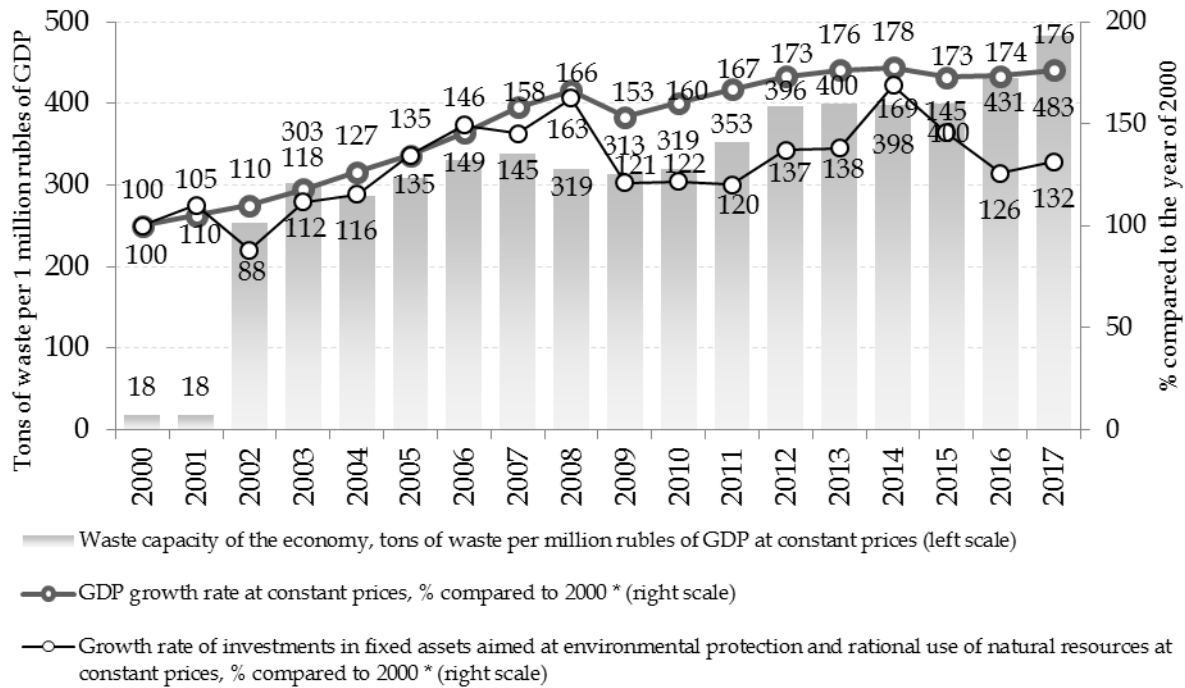
Note: *Revaluation of indicators of GDP and investments in fixed assets aimed at environmental protection and rational use of natural resources at constant prices (the year of 2000) was carried out by extrapolating the base period using the volume indexes (in % to the previous year).

Fig. 2. Dynamics of indicators of waste output, basic growth rates of GDP and investments in environmental protection (calculated by the authors using the data provided by the Federal State Statistics Service of Russia)

The data of Fig. 2 demonstrate that for the period of 2000–2017 GDP (at constant prices) increased 1.7 times, while investments in fixed assets related to environmental protection and the rational use of natural resources – only 1.3 times. Since 2009, there is an obvious trend of the rates of capital investments accumulation lagging behind the rates of economic growth. A significant reform of environmental protection legislation in 2014 led to a slight increase in environmental investment, but the autonomous recession of 2013–2016 neutralized virtually all the achieved growth. For instance, according to the results of 2017, the volume of capital investments in environmental protection in real terms was only 0.26% higher than in 2000. Given the high degree of depreciation of fixed assets (according to 2017 data, this figure estimated 47.3%), such an increase cannot neutralize the growing technogenic impact on the nature.

It should be mentioned that in recent years there has been a decline in the share of investments in fixed assets related to environmental protection from pollution by production and consumption wastes in the total amount of environmental investments (Fig. 3). For instance, in 2014 it estimated 10%, in 2015 – 8%, and in 2016 – 6%. Even the absolute growth of these investments in actual prices for the analyzed period is incomparable with the dynamics of the waste output of the economy.

Investment curve in Fig. 3 has a stepped configuration: there are two clearly visible periods during which the value of investments on average fluctuated at the same level. The first one is from 2000 to 2006 estimating from 2,000 to 3,000 million rubles, and the second is from 2008 to 2014 – from 7,000 to 8,000 million rubles.
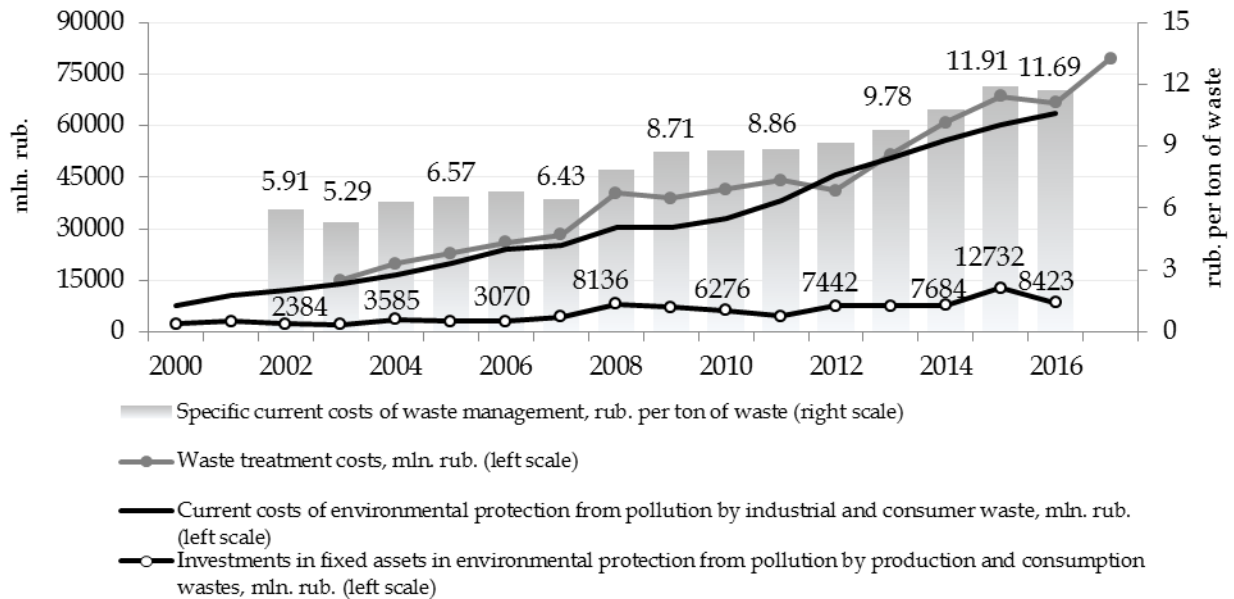
Fig. 3. Dynamics of investments and costs of environmental protection from pollution by production and consumption wastes, in actual prices. Calculated by the authors using the data provided by the Federal State Statistics Service of Russia.

The growth in the investments in fixed assets aimed at environmental protection from industrial and consumer waste was recorded only in 2015 and estimated 5,048 million rubles. It can be assumed that this is a reaction to the amendments to the Federal Law of June 24, 1998 No. 89-FZ "On Production and Consumption Waste" introduced from January 1, 2014, providing for territorial plans and regional programs in the field of waste management, investment programs of municipal solid waste management companies, environmental charge and a number of other innovations compelling or fiscally stimulating the parties of the waste management system to introduce new facilities for their disposal.

However, in the context of inflation, the indicators in actual prices cannot accurately reflect the real amount of spending. Their physical volume index presents better comparable data on the dynamics of the environmental expenditures. It is calculated by the Federal Statistics Service of Russia only for the period from 2013. The physical volume index for waste management costs is decreasing: in 2013 it estimated 119.98%, in 2014 – 111.7%, in 2015 – 97.56%, and in 2016 – only 90.1%. Consequently, in real terms, the volume of these investments is decreasing, considering all the institutional units of the Russian economy from 2015.

Besides, the authors of this article performed a regression analysis, which enabled to establish a statistically significant relationship between the real GDP of the Russian Federation and environmental investment (the methods used were named in Section 2 of the article).

The obtained regression model (1) demonstrated the need for additional adjustment of the list of indicators included in it. For instance, the level of statistical significance of the relationship between environmental investments and GDP (*rgdp*) turned out to be insufficient not only for the actual value of the logarithm of real investments in fixed assets aimed at environmental protection and rational use of natural resources, but also for the values of this indicator shifted by 1, 2 and 3 periods. Thus, the assumption about the impact of these investments on the GDP of the Russian Federation was not verified. This factor was excluded from the model, and the final regression equation includes such independent variables as *i* and *epsi*. The parameters of the regression equation are presented in Table 2.

Table 2. Results of the regression analysis of the real GDP factors (rgdp) (Russia, 2000–2017)

Determinants	rgdp
Intercept (α)	7.676232**** (20.47462)
i	0.620193**** (25.36544)
epsi	0.270875**** (5.70009)
F-test	586.94 (p<0.001)
R2	0.986
D-W	1.576

Note: ****p < 1 %.
 Calculated by the authors using the data provided by the Federal State Statistics Service of the Russian Federation and the OECD database using Statistica 12 software.

Analysis of the residuals shows that they are distributed normally and the resulting model can be applied. For instance, the following results confirm the normal distribution of the residuals: the normal-probability graph (Fig. 4a) shows that the residuals are fairly densely placed relative to the hypothetically normal curve; the graph of the residuals and predicted values (Fig. 4b) demonstrates that there is no systematic distribution of the residuals; the value of the standard error of residues asymmetry (0.536278) more than three times exceeds the value of asymmetry (0.163249), which is also the evidence of the normal distribution. Besides, value $p = 0.281$ for the Shapiro-Wilk test does not demonstrate that the residues are distributed abnormally. However, the histogram of residuals does not fully indicate their normal distribution (Fig. 4c), which means that the model should be used with caution.

(a)   (b)

(c)
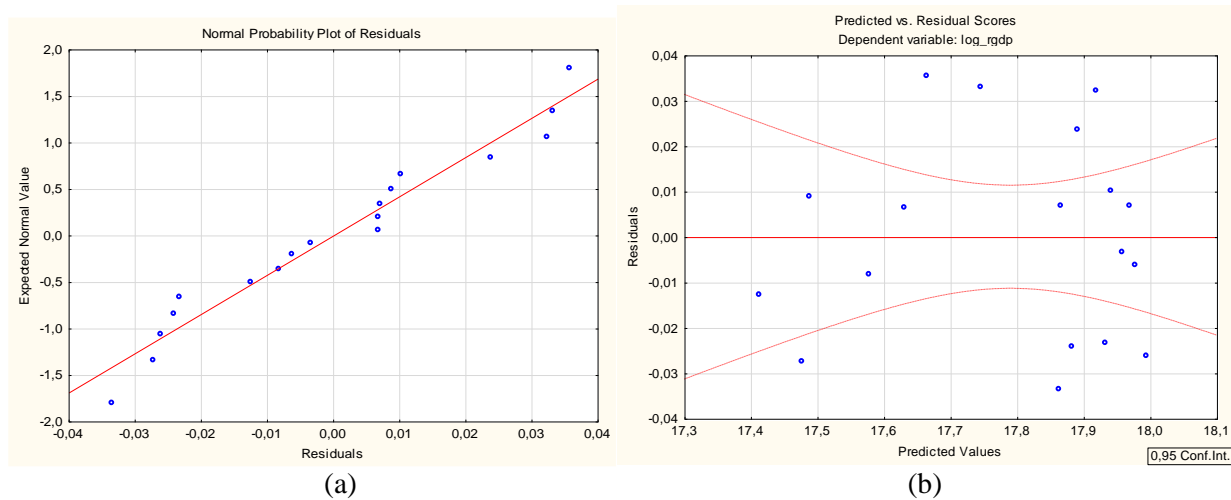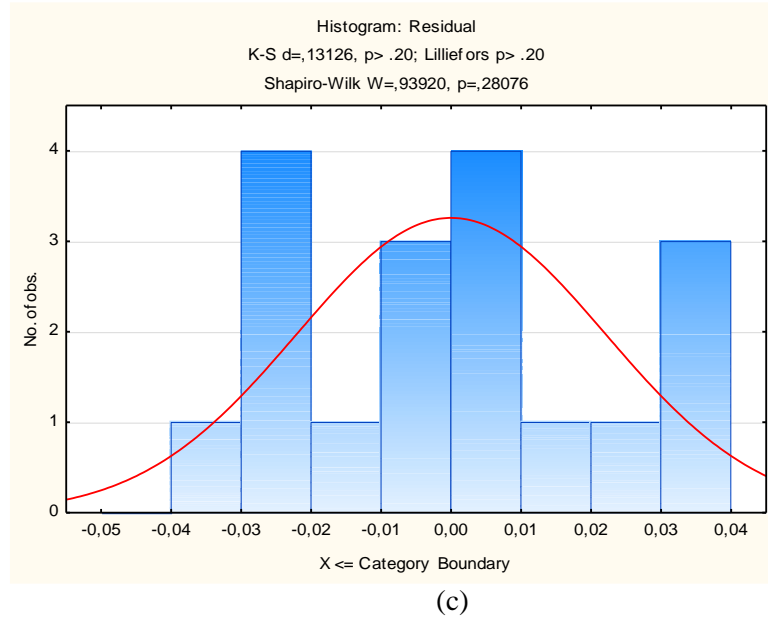
Fig. 4. Residuals analysis in the regression model

The most interesting phenomenon here is not actually the strong mutual influence of investments and the real GDP, which is, in fact, another proof that the post-Keynesian theory is correct, but the fact that the Environmental Policy Stringency Index is positively and statistically significantly connected with Russia's the real GDP. The result indicates that the tightening of environmental policies in the Russian Federation in the analyzed period was accompanied by GDP growth. Therefore, it can be concluded that increasing government attention to the environmental component of economic growth is not only justified, but is also expedient. Probably, this is due to the need to improve the qualitative component of GDP dynamics, which may be promoted by the rigor environmental policy.

In order to classify the regions of the country according to the level of environmental investment and pollution, we conducted a cluster analysis. When carrying out the clustering were used, such regional indicators as the density of the population in 2018, people per km sq (dens_2018); investments in fixed capital for environmental protection and rational use of natural resources per capita in 2018, units of national currency per person (inv_env_per_capita_2018); emissions of air pollutants from stationary and mobile sources, in 2018, kg per person (air_pol_per_capita_2018).

Descriptive statistics showed significant standard deviations for these indicators (table. 3) and we standardized the data (led them to a dimension with a standard deviation of +1).

Table 3. Descriptive Statistics

Variable	Original data			Standardized data		
	Min.	Max.	Std. Dev.	Min.	Max.	Std. Dev.
dens_2018	0,06847	4810,19	671,472	-0,20864	6,954910	1
inv_env_per_capita_2018	0,00000	16057,46	2430,998	-0,48474	6,120558	1
air_pol_per_capita_2018	21,02590	1114,25	192,463	-1,12530	4,554893	1

At the end of the preparatory procedures we started cluster analysis. Plot of linkage distances across steps (Fig. 5) shows that the most appropriate number of clusters in our example will be 5, based on this, we decided to check this number of groups in the tree diagram and via the k-means method.
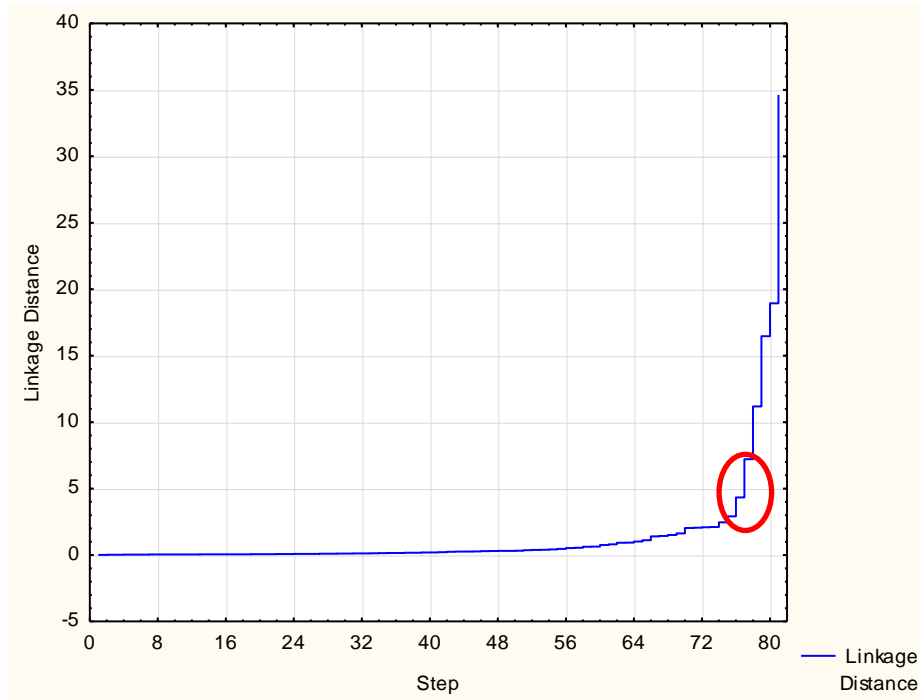
Fig. 5. Plot of Linkage Distances across Steps (Euclidean distances)

At the next stage, we built a horizontal tree diagram (Fig. 6) using the Ward's method. Visual analysis of the tree diagram confirmed that it is advisable to select 5 clusters. The final stage of cluster analysis is the description of the distinctive features of clusters, but the tree diagram does not answer this question.
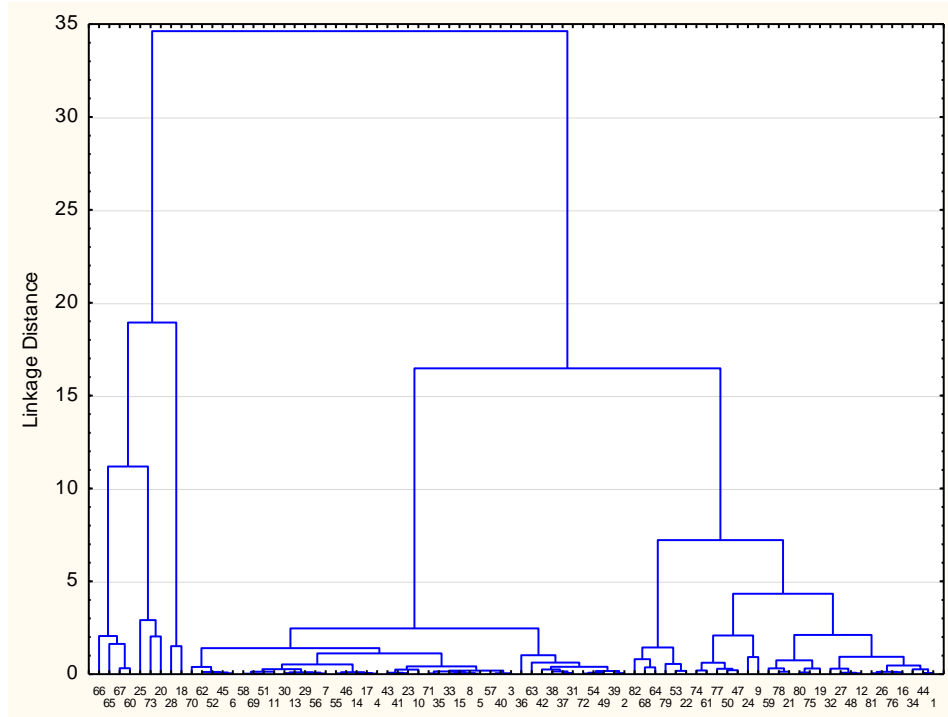
Fig. 6. Tree Diagram by Ward`s method (horizontal axis – region's number)

In order to specify the list of the clusters' members, we used the k-means method, and the distinctive features of the clusters are shown in figure 7.

The analysis shows that the structure of the clusters differs slightly from that shown in the tree diagram. Cluster 1 includes regions with the highest environmental investments per capita, low population density, and above-average emissions. This cluster includes three Northern regions of the country.
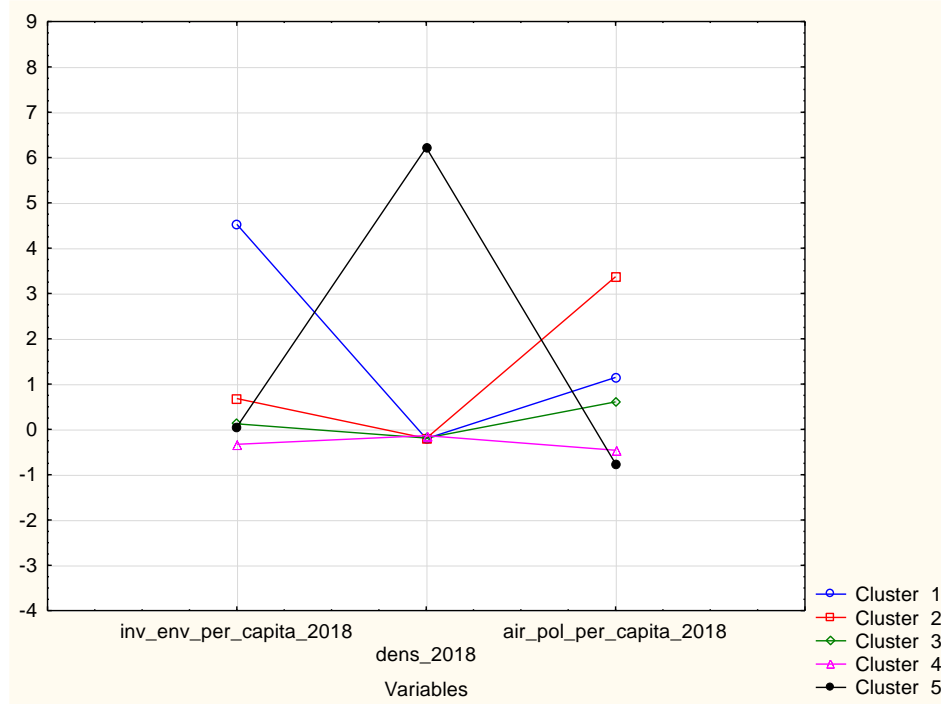
Fig. 7. Plot of Means for Each Cluster

The main feature of the second cluster is the high level of air pollution. This cluster is also small and consists of 4 regions. Clusters 3 and 4 are the most numerous (17 and 56 regions), but they do not show such significant features as the previous two. Note that cluster 3 is characterized by minimal air pollution and minimal ecological investments per capita. Cluster 4 is observed of bigger pollution and the volume of an investment than in cluster 3. Cluster 5 consists of two regions – Moscow and St. Petersburg, and it is characterized by a high population density while the other indicators at minimum levels. The regions of Cluster 5 can be considered as uncharacteristic of the regions in this study. The 3d Scatterplot allows visualizing the position of the regions (Fig. 8).
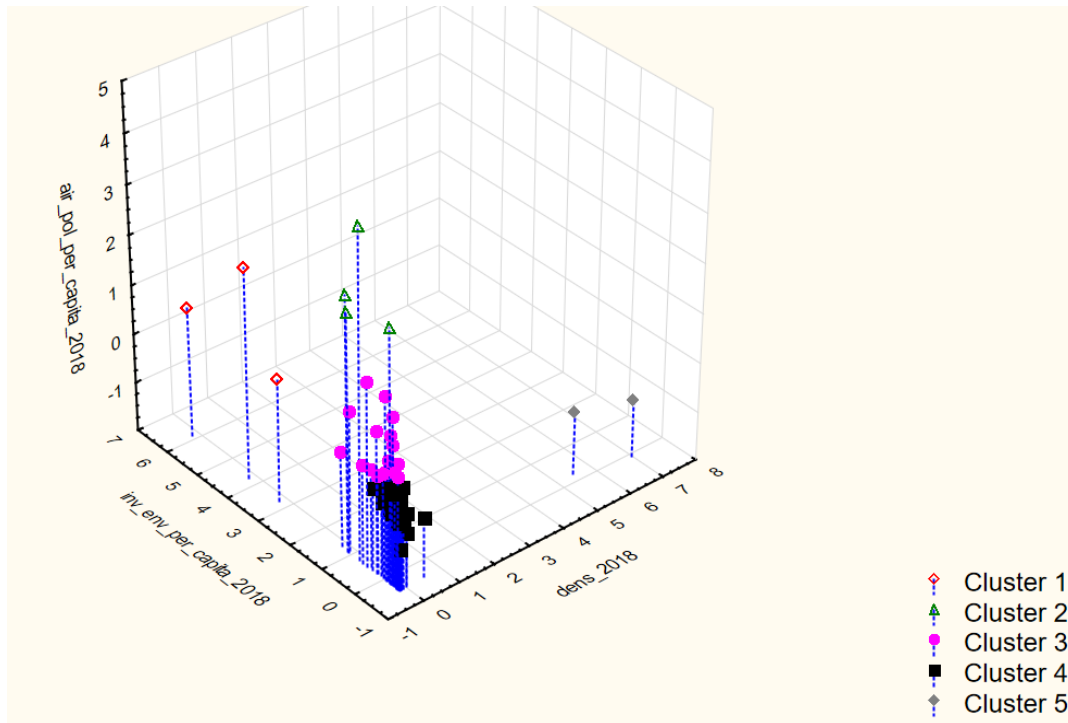
Fig. 8. 3D Scatterplot for 5 clusters

Thus, the assumption that investment in environmental protection increases with increasing pollution is not confirmed for all regions. For some of them, we see a high level of investment with a relatively low level of pollution, in others – strong air pollution is not accompanied by significant investments.

Thus, the conducted regression analysis allows drawing the following conclusions:

- The calculations did not show a statistically significant relationship between the value of Russia's the real GDP and environmental investments, that is, investments in fixed assets aimed at environmental protection and rational use of natural resources;

- The constructed model of changes in the real GDP is described by the factors included in it for 98.6%;

- The Environmental Policy Stringency Index is positively connected with the dynamics of the real GDP, that is, the tightening of environmental policy is accompanied not by a decrease, but by an increase in GDP

- The assumption that investments in environmental protection increase with increasing pollution is not confirmed for all regions of Russia. For a number of them a high level of investment is accompanied by a low level of impurities, and for some opposite – strong pollution is not accompanied by substantial investment.

7. Discussion

In the current situation, the Russian Federation may be able to solve some of the most pressing environmental problems while maintaining economic growth, in other words, to get out of the complex growth dilemma if it recognizes environmental investment as a strategically significant measure (Senchagov, 2013). According to the authors of this article, within the neo-industrial paradigm of modern development this implies observing the following basic conditions:

1) *Reaching a rational (marginal) value for such a comprehensive and integrated indicator of sustainable and safe investment and innovation activity as the share of the gross investment accumulation in GDP*. As noted above, environmental investment, which involves replacing traditional technologies with environmentally friendly or low carbon technologies, improving the quality of the environment, focuses on the development of knowledge-intensive and innovative, and hence capital-intensive industries and sectors of the economy. Under these conditions, it seems viable to increase the share of gross investment in Russian GDP from today's 23.0% to 28–30%, "... directing it through the Russian Development Bank to targeted investment in innovation, including the development of clean technologies..." (Senchagov, 2015).

To increase the share of gross accumulation in Russian GDP, it is important to create a reliable mechanism for the transformation of funds accumulated by the population into environmental investments by guaranteeing a full return of deposits in case of a financial meltdown and giving higher interest rates for investment in green securities funding environmental investment projects;

2) *Increasing the attractiveness of environmental investments for private capital through the policy of lowering prices for low-carbon investment projects*. This policy implies the development and implementation of environmental standards and norms, eco-management and auditing (ISO 14000, EMAS), increasing taxation on the use of natural resources while reducing the tax burden on other factors of production; government guarantees on loans to clean technologies and green companies (Fontana, 2016); waiver of subsidies that encourage using the energy of hydrocarbons (oil, coal) and depleting natural capital; and, on the contrary, stimulating subsidies for clean energy (solar energy, wind energy, biomass, bio-diesel and bio-ethanol, biogas, energy of waves and tides, small hydropower plants, geothermal and hydrogen energy), and clean technologies; developing a target value system to check the reliability of environmental investments; creating "test" territories (the initiative of the People's Republic of China) and using them to try a system for trading carbon rights to emissions and their reduction units (credits or offsets, CO_2 absorption units and other carbon units). There is no doubt that such a policy requires a strong political will. At the same time, it is obvious that basically it facilitates the gradual transformation of environmental responsibility into an economic asset (Glinkina, 2018);

3) *Consolidation of resources* for financing environmental investments through the expansion and integrated use of various financial sources and institutions. This refers not only to state support for these investments, green lending and green bonds, but also private investments in environmentally friendly technologies and improving the environment by "business angels", venture capital, and others. Such an approach is supported by the results of an original regression model for the Russian economy: the tightening of environmental policies in Russia is accompanied not by a decrease, but by an increase in the real output in the country, the accumulation of environmental investments through public policy instruments is not only permissible, but is also necessary for efficiency growth.

Here it should be said that the proposed recommendations are adequate not only to the goals, objectives and driving forces of the neo-industrial paradigm of modern development, but can also help implement a set of

principles governing green (environmental) financing proposed in the Communique of the G20 leaders following the summit in Hangzhou (China) (2016) that would stimulate sustainable, balanced and inclusive economic growth.

Conclusions

These considerations enabled the authors to conclude that to solve the complex growth dilemma in all countries of the world, including Russia, today, it is necessary to use environmental investment (Jackson, 2011). It can be the most adequate neo-industrial response to the environmental challenges of the present day and allow maintaining the potential for Russia's economic growth for a long period, initiating the transformation of the national economy in the 21st century.

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FACTORS AFFECTING PURCHASE INTENTION OF COMMUNITY PRODUCT IN THAILAND-CAMBODIA BORDER*

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Abstract. The objective of this research was to study for the influence of culture dimensions, perceived quality, brand image, country of origin, word of mouth on purchase intention of community product in Thailand, the views from Cambodian consumers in Thailand-Cambodia Border. This research used the questionnaire as a tool for data collection. A sample was selected from Cambodian consumers on the Thailand-Cambodia border, 400 cases. Qualitative and quantitative data analysis was conducted by descriptive statistics and multiple regression analysis. The findings indicated that the culture dimensions, brand image, country of origin, word of mouth had a positive influence on the purchase intention of community products in Thailand with statistical significance. It was utilizable for the government and private sector as a guideline to make the marketing policy and strategy concerning the community product on the Thailand-Cambodia border. Regarding border trade, the culture dimensions, brand image, country of origin, word of mouth had a positive influence on purchase intention. Hence, for border trading there had to emphasize the importance of these factors.

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1. Introduction

While Thailand was facing an economic crisis, people in every class of Thailand encountered various problems, in particular, most people's problems as poverty. The government at that time, thus declared war on poverty. Accordingly, an idea of improving local community product was come up with under a program "One Tambon One Product" which was modeled on "One Village One Product" of Japan.

One Tambon One Product got the promotion and support from the government agencies to encourage in the product development, as well as, national and international market expansion including the border market. Furthermore, the Thailand-Cambodia border market expansion was the main target of Thailand. Being the guideline on the market expansion and marketing promotion of a local community product, this research on the factors influencing intention to purchase Thai community products in view of Cambodian consumer was conducted. The consequence of literature review and research of many academicians such as Rajagopal (2011); Fiato et al., (2014); Tee et al., (2015); Chen & Fan (2017) indicated that assorted factors had an influence on the purchase intention. However, none of the researchers had studied the influence of cultural dimension, perceive Quality, brand image, country of origin, word of mouth on the purchase intention. This research worker was hence interested in studying the influence of these factors on intention to purchase Thai community products in view of Cambodian consumer, Thailand-Cambodia border.

2. Literature review

1. Purchase Intention (PI)

Purchase Intention referred to the probability that a consumer would willingly buy a particular product (Dodds et al., 1991). Purchase Intention was the phenomenon as the projected behavior of consumers about purchasing, as well as, repeatedly purchasing the product, i.e. when the consumer made a decision to buy a product, that consumer would come to buy it again. Fundos & Flavian (2006) mentioned that the consumer models generally affecting the consumers' intention to purchase any of the products were perceived as a well-known theory, the theory of planned behavior (TPB). The theory of planned behavior (TPB) postulated the antecedent of attitudes, subjective norms, perceived behavioral control and the intention itself (Ajzen 1991). Wiyadi & Ayunintyas (2019) mentioned that factors affecting purchase intention were associated with feelings and emotions. In case any products or goods made happiness and satisfaction in buying them, the purchase intention of those products was a consequence**.** The intention of purchasing a firm's product made a greater competitive advantage over its competitor. The purchase intention could be established by various factors subsequent to the evaluation of those factors Keller (2001); Tee et al., (2015); Siti et al., (2014); Tee et al., (2013). Agreeing with Xiao et al., (2019), it was important to determine the factors in purchase intention owing to the difficulty in assessing customer's expectations. Generally, the business would recognize it after the product had been purchased already. Hence the purchase intention was taken primary responsibility by businesses considering that it was the significant tool in making a competitive advantage, although finding it hard.

2. The Relationship between variables

1. The relationship between culture dimensions (CD) and purchase intention (PI)
Globalization marketing was to build a homogenized market involving consumers from varied geography and cultural background. The consumer from the same regions would hand similar product preferences out (Theodore, 1983). Furthermore, the consumers in a different culture, who had different attitudes and preferences as well as the different tastes, were still reluctant to purchase foreign products (Suh & Know, 2002). Regarding globalization marketing, a dimension of culture had a huge impact on the consumers' behavior (Jing, 2011; Gupta,

2012). Further findings showed that the cultural aspects and cultural milieus had an influence on purchase intention (Zhang & Khare, 2009; Gupta, 2012). The consumers from each country had various reasons to purchase the products and services, therefore the firm had to carry out the different plans and strategies to meet the consumers or markets' needs (Jing, 2011). As a study by Gaur et al., (2019) on purchase intention of products cross-culturally between USA and Indian customers, it was found that different socio-cultural norms of each country resulted in the different recognition of the importance of product's quality and brand image. Consistently, Yin et al., (2019) had proved that the cultural dimension had significance and impact on purchase intention. Hence, the cultural dimension was important to make the purchase intention of consumer purchasing. Regarding the literature review, the following hypothesis could be made:

H1: The cultural dimension had an influence on purchase intention.

2. The relationship between brand image (BI) and purchase intention (PI)

The brand image was an important thing for the consumers' willingness of product purchasing processes. The brand information had a positive effect on perceived quality, perceived value and purchase intention (Dodds, 1991; Monroe & Krishnan, 1985). Consumers positively inclined to perceive foreign brand images. This meant that while the customers with the brand image perception were making the selection of products, these consumers would require the strong brand imaged products for deriving the satisfaction (Kinra, 2006). A successful brand image gained the consumers' satisfaction with the brand in comparison to its competitors, and it consequently increased the likelihood of purchase repetition (Pan et al., 2004). Most of the consumers purchased the well-perceived and good brand imaged products because the positive brand image affected the lower perceived risks (Simonian et al., 2012). Moreover, Wang & Tsai (2014); Berbel-Pineda et al., (2018) found that the brand image increased the consumer's purchase intention. While the findings of Wiyadi & Ayunintyas (2019) research showed that customers who had a positive image of a brand intending purchase of the product. Since the brand image represented beliefs, ideas, and impressions of the product. Research of Yu et al., (2018) was contrary to Wiyadi & Ayunintyas (2019), the results indicated that negative brand image affecting the decrease in purchase intention of customers. Hence, the entrepreneurs or business owners would attempt to build the worth or value of brand image through various advertisements or promotion. Regarding the literature review, the following hypothesis could be made:

H2: Brand Image had an influence on purchase intention.

3. The relationship between perceived quality (PQ) and purchase intention (PI)

Perceived quality was a critical element in the consumer purchasing decision, thus consumers would compare the quality of alternatives regarding the price within the same category (Jin & Suh, 2005). Product quality was a very important thing for consumers. When they made a purchase decision, they would evaluate the quality of the product first. If they thought the product quality was reasonable with the price, and then they would intend to purchase (Tee et al., 2015). In other words, the perceived quality directly affected the reputation of the firm according to its product. Producing good quality products by the firm, the consumer believed with the product and also made a satisfaction (Davis et al., 2003). This corresponded to Konuk (2018); Wiyadi & Ayunintyas (2019). They found that product quality had a positive influence on purchase intention. Product quality was a factor indicating the product's toughness and reliability which made competitive products against the competitors' products. The perceived quality had an impact on the market and consumers. Since the perceived quality arousing the feeling of good quality products, it brought about the purchase intention among the consumers (Tee et al., 2013). Tsiotsou (2006) investigated both direct and indirect effects of perceived quality on the purchase intention. The findings indicated that the perceived quality had a direct and indirect effect on purchase intention. Regarding the literature review, the following hypothesis could be made:

H3: Perceived quality had an influence on purchase intention.

4. The relationship country of origin (COO) and purchase intention (PI)

Country-of-origin could be defined as any influence that the country of the manufacturer had on both positive and negative consumers' perception of a product (Cateora & Graham, 1999; Yunus & Rashid, 2016). The country-of-origin created a customer's view of product differentiation from each country (Anwar et al., 2013). The image of the country-of-origin of the product that presented the picture and reputation to the consumers was attached to the consumers' minds. This image was created by such variables as national characteristics, economic, political background, history and traditions (Nagashima, 1970). These images of the country-of-origin affected the product purchase intention. Expressly, the consumers; who had knowledge of the products, recognized that they were made aboard with good quality production; would be satisfied resulting in the purchase intention on those products (Bhakar et al., 2013). This was consistent with Ghalandari & Norouzi (2012); Berbel-Pineda et al., (2018) mentioning that the effect of country-of-origin influenced the willingness to purchase of the consumer. The consumer with low product knowledge had a lower willingness to purchase the product from a foreign country. Esch et al., (2018) defined that country of origin became an important factor in the purchasing process for consumers. When the information of the country of origin was insufficient, consumers would additionally seek such product reviews. Hence, the country of origin brought about the increase in purchase. Regarding the literature review, the following hypothesis could be made:

H4: Country of origin image (COO) had an influence on purchase intention.

5. The relationship between Word of mouth (WOM) and purchase intention (PI)

Arndt (1967) characterized Word of mouth as an oral communication relating to brand, product or service in person-to-person. The receiver spread the received information non-commercially. Silverman (2001) defined Word of mouth as communication that was independent concerning the products and services among the consumers being out of the marketing medium. Carl, 2006; Voyer & Ranaweera (2015) specified Word of the mouth that was the non-commercial evaluation of brands, services or organizations distributed by face-to-face or other communicating channels via the social network. Word of mouth was considered more reliable than advertising or personal selling. The consumer considered the opinion basing on the personal experience, either positive or negative opinion, that it was more dependable than a product and service advisor. Therefore, Word of mouth was a reference point for customer purchase intention (Sen & Lerman, 2007; Kuo et al., 2013). Furthermore, it was found that Word of mouth could enhance the reputation for running a business because the information from Word of mouth traveled fast. As Zhang et al., (2018) research, the findings showed that word of mouth affected purchase intention of consumers. Word of mouth could reduce a negative image, moreover, the product and brand with positive word of mouth would receive the trustworthiness from consumers. For this reason, an attempt to increase the positive Word of mouth influenced the consumers and boosted the firm's profit (Lin & Lu 2010). Regarding the literature review, the following hypothesis could be made:

H5: Word of mouth (WOM) had an influence on purchase intention.

Framework
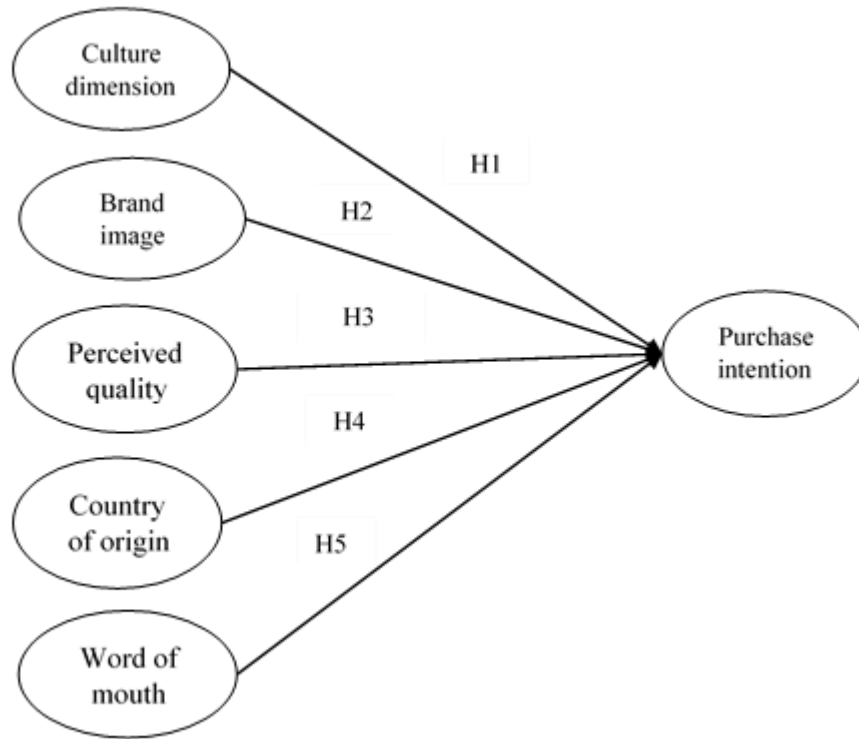
Figure 1. Hypothetical Model

3. Methodology

1. Sample

This research was quantitative research. A sample for studying was Cambodian consumers around the Thailand-Cambodia border (Aranyaprathet – Poipet border station), 400 cases. The sampling method based on Yamane (1973) at 95% confidence level.

2. Instrument

The research instruments were the questionnaire including 26 questions that were developed from varied academicians. There were 5 independent variables which were; (1) Culture dimension, 3 questions derived from Moon et al., (2008); lhtiyar et al., (2012). (2) Perceived quality, 4 questions derived from Khraim (2011); Gillani et al., (2013); Foroudi et al., (2018) (3) Brand image, 5 questions derived from Khraim (2011); Gillani et al., (2013); Foroudi et al., (2018); Melewar et al., (2017) (4) Country of origin, 5 questions derived from Yunus & Rashid (2016); Tee et al., (2015) and (5) Word of mouth, 4 questions derived from Mikalef et al., (2013); Sharma et al., (2015); Chiu et al., (2016). Moreover, the dependent variable was the purchase intention of Cambodian consumers around the Thailand-Cambodian border, 5 questions being derived from Khraim (2011); Gillani et al., (2013). The questionnaire type was the five-point Likert scale (Likert, 1970) scoring start from 1 strongly disagree to 5 strongly agree.

Testing instruments for the reliability was assessed by 5 experts according to the Index of Item Objective Congruence (IOC) technique. The questionnaire's quality testing resulted in IOC value over 0.6 for all questions. Validity value was examined by Try-out involving a similar population, 30 samples, resulting in the reliability of Cronbach's value 0.963.

Data analysis and statistics of the research included descriptive statistics and inferential statistics. The descriptive statistics were an average, Alpha-Coefficient. The inferential statistics were Multiple Regression Analysis.

4. Analysis

1. Sample characteristics

Most of the samples were; female 50.67 percent, aged between 21 – 30 years 47.67 percent. They generally had an average income of 159.75\$-479.23\$ equaling to 49.67 percent, as well as educational attainment lower bachelor degree as 97.67 percent.

Results of research on the cultural dimension, brand image, perceived quality, country of origin word of mouth influencing purchase intention

Table 1. Intercorrelation coefficient between purchase intention and among independent variables

Variable	PI	CD	BI	PQ	COO	WOM	Mean	SD	Collinearity		Result
									Tolerance	VIF	
PI	1.00	0.63*	0.75*	0.65*	0.73*	0.79*	3.78	0.80			Agree
CD		1.00	0.65*	0.60*	0.56*	0.49*	3.97	0.81	0.53	1.88	Agree
BI			1.00	0.68*	0.74*	0.67*	3.85	0.75	0.33	3.05	Agree
PQ				1.00	0.71*	0.61*	3.71	0.75	0.40	2.47	Agree
COO					1.00	0.67*	3.82	0.77	0.34	2.91	Agree
WOM						1.00	3.69	0.84	0.47	2.13	Agree

* $p < 0.001$, N=400

The findings showed the culture dimension (r=0.63, $p < 0.001$), brand image (r=0.75, $p < 0.001$), perceived quality (r=0.65, $p < 0.001$), country of origin image (r=0.73, $p < 0.001$) and word of mouth (r=0.79, $p < 0.001$). All of the variables had a positive correlation (r) with the purchase intention being statistically significant. Examining mean, it was found the mean as; the cultural dimension (CD) of 3.97, brand image (BI) of 3.85, perceived quality (PQ) of 3.71, country of origin (COO) of 3.82 and word of mouth (WOM) of 3.69. All of the variables had an influence on purchase intention with the opinion level of agree. Furthermore, the estimation of the mean of purchase intention (PI) equaled to 3.78 at the opinion level of agree.

As a consequence of testing the correlation between independent variables, the size of correlation (r) was in a range of 0.49 to 0.79. The findings revealed that every pair had a statistically significant correlation at level 0.001which the correlation values among entire independent variables were moderately high. Tolerance value was in the range of 0.33 to 0.53. Particularly, the mentioned value over 0.2 was deemed that the independent variables; had low correlation, were independent, without Multicollinearity problem. These agreed to the conditions for analyzing multiple regression. Moreover, VIF (Variance Inflation factor) in the range of 1.88 to 3.05, not over 10, was deemed that no correlation among the independent variables meeting the criteria of Hair et al., (2006). It could be concluded, therefore, that the independent variables; had no Multicollinearity problem and were applicable to analyze multiple regression for determining influential variables on the purchase intention, as shown in Table 2.

Table 2. Regression model of culture dimensions, perceived quality, brand image, country of origin, word of mouth influenced purchase intention

Predictor	B	Beta)β(	t	p
(constant)	-0.026		-0.191	0.848
CD	0.174	0.176	4.469	0.000***
BI	0.184	0.053	3.459	0.001**
PQ	0.019	0.048	0.395	0.693
COO	0.175	0.051	3.456	0.001**
WOM	0.452	0.040	11.439	0.000***
R=0.871, R2=0.759, R2Adj=0.755, ***p<0.001, **p<0.01				

The multiple regression analysis results revealed that the independent variables as culture dimensions, brand image, perceived quality, country of origin, word of mouth had 75.90 (R2) percent influence on purchase intention. The cultural dimension (CD) (β=0.176) had the highest influence on the purchase intention, respectively following by brand image (BI) (β = 0.053), country of origin (COO) (β = 0.051) and Word of mouth (WOM) (β=0.040) with statistical significance. Thus, the multiple regression equation could be written as follows;

$$PI = -0.026+0.174CD^{***}+0.184BI^{**}+0.019PQ+0.175COO^{**}+0.452WOM^{***}$$

where   PI was purchase intention
                            CD was a cultural dimension
                            BI was the brand image
                            PQ was perceived quality
                            COO was country of origin
                            WOM was the word of mouth

Regarding multiple regression equation analysis, the research hypothesis testing resulted in Table 3.

Table 3. Result of the research hypothesis

Hypothesis Testing			T-value	P-value	Result
H1: CD	→	PI	4.469	0.000***	Accepted
H2: BI	→	PI	3.459	0.001**	Accepted
H3: PQ	→	PI	0.395	0.693	Rejected
H4: COO	→	PI	3.456	0.001**	Accepted
H5: WOM	→	PI	11.439	0.000***	Accepted

According to the researching hypothesis, it was found that the cultural dimension had a positive influence on the purchase intention (P < 0.001) supporting the hypothesis H. The brand image had a positive influence on the purchase intention (P < 0.001) supporting the hypothesis H2. The country of origin had a positive influence on the purchase intention (P < 0.001) supporting the hypothesis H4. The word of mouth had a positive influence on the purchase intention (P < 0.001) supporting the hypothesis H5 as described in Table 2.
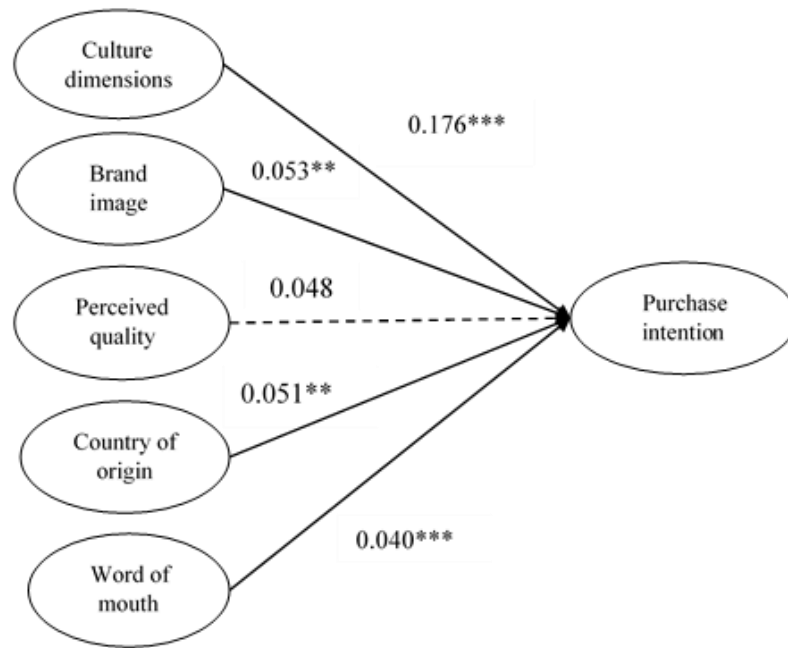
Figure 2. Research Model

5. Conclusions

This research showed that culture dimension (CD), brand image (BI), Country of origin (COO) and Word of mouth (WOM) had the influence on purchase intention of Thailand's community product in view of Cambodian consumer with statistical significance. That was; 1) cultural dimension had a positive influence on purchase intention which was consistent with the research of Berthon et al., (2009); Yin et al., (2019) cultural dimension positively influenced the purchase intention. Owing to similarities to characteristics of culture, geography and consumer behavior between Thailand and Cambodia, these made Cambodian consumer requirements corresponded to Thailand. The community products were thus needed, resulting in the purchase intention from Cambodian consumers. 2) The brand image had a positive influence on purchase intention because of Cambodian consumers' viewpoint on Thai products as relative quality. Hence, the community products with Thai brands were moderately good in Cambodian consumers' views resulting in the purchase intention of them. It was consistent with Tee et al., (2015); Berbel-Pineda et al., (2018); Wiyadi & Ayunintyas (2019) that consumer's brand image perception affected the purchase intention consequent the entrepreneur marketing fast. Yu et al., (2018) found that negative publicity of the brand had an impact on purchase intention of consumers. In other words, consumers who conceived the brand with negative images, consumers' confidence in product qualities and values was decreased accordingly. In order to build a brand image, the firms might invest in adding value or promoting the product being well-known (Wang & Tsai, 2014). 3) The country of origin had a positive influence on purchase intention. Due to cultural dimension and confidence in brand image, the products originated from Thailand were good and required by Cambodian. Yunus & Rashid (2016); Tee et al., (2015); Esch et al., (2018); Berbel-Pineda et al., (2018) mentioned that the country of origin was the derivation of different viewpoints in each country. 4) Word of mouth had, further, a positive influence on the purchase intention, which was consistent with the findings of Khan et al., (2015); Solang et al., (2017); Zhang et al., (2018) as word of mouth has a positive effect on customers' purchase intention. Using the influence of WOM was worthwhile to build an efficient market. Such influence was

used for creating a brand and product purpose, ultimately, with purchase intention consequence. The reason behind might relate to lifestyle characteristics of Cambodian around the border that having fewer the other channels of media consumption. Because they gave their undivided attention to earn a living, the known goods or products were passed on by consumer's acquaintance. Thus, communication by word of mouth affected Cambodian customers' purchase intention.

6. Limitation and Future Reasearch

The sample of this research was restricted to Cambodian consumers around the Thailand-Cambodia border, Aranyaprathet – Poipet border station only. In the future, information about Cambodian consumer in other border stations around the Thailand-Cambodia border may be gathered for the comparative factors, which influence the intention of purchasing Thai community product by Cambodian consumer in each area.

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OBSTACLES AND SUCCESS FACTORS FOR ENTREPRENEURSHIP: A COMPARATIVE ANALYSIS BETWEEN EGYPT AND NIGERIA

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Abstract. This study investigates the obstacles and success for entrepreneurship at Africa The study also provides a framework for determinants of entrepreneurship that includes three groups of factors: (1) obstacle factors, which include financial and non-financial obstacles; (2) success factors, which include gaining an understanding of the economic environment, determining market gaps, ensuring capital adequacy, and creating a stable cash flow; and (3) business model characteristics, which include benefits for clients, suppliers, founders, investors, and other stakeholders. The study hypothesizes hat there is a relationship between the second and third groups, which creating a new value chain (tangible or intangible) to the society with support from stakeholders. A questionnaire survey was conducted with founders, investors, corporate managers, financial analysts, academics, and graduates who seek new projects from Egypt and Nigeria, and 395 questionnaires were received in the second half of 2018. The study found a difference in entrepreneurship nonbanking and non-financial obstacles between Egypt and Nigeria. This can be explained by differences in the level of efficiency of the stock exchanges and non-banking services, in addition to the differences in legal environments and levels of corruption between Egypt and Nigeria. Moreover, future directions of entrepreneurship are similar across countries, but age has an impact on these directions.

Keywords: entrepreneurship; business model; entrepreneurship obstacles; entrepreneurship success; Egypt; Nigeria

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JEL Classifications: M13, L22, L26

1. Introduction

1.1 Background

People have many career options after graduating or gaining professional experience. Some choose to start their own businesses. The process of creating and managing a business to achieve the desired objectives is the basis of entrepreneurship. The ability to see emerging trends and create a business that satisfies consumer needs or creates new markets is the first step towards entrepreneurship.

Some global examples of entrepreneurship include Alibaba.com, Facebook, Google, and Uber, while some examples in the African context include 57357 Hospital, Careem, Glowork, and Vezeeta.com, there are diverse types of entrepreneurship for the provision of services and products, whether they are for profit (the majority) or non-profit (rare cases). Today, many universities offer entrepreneurship courses; however, not all entrepreneurs succeed.

Finlliy, this study help an African governments and international organizations to effective implementation of entrepreneurial support program, through creating a new value chain at thire society (this value be a tangible and intangible) get stakeholder support.

1.2 Literature review

Since the middle of the 1900s, there have been many developments in the business environment, in both international and local business, due to changes in technology in general and information technology in particular. This has helped to increase business opportunities for small and medium-sized enterprises (SMEs) through economies of scale.

After the spread of Internet services and mobile networks through 3G, many new terms such as the following have emerged: financial technology (FinTech), digital banking (BankTech), anti-money laundering (AML), combating terrorist financing (CFT), digital currencies (CoinTech), and regulatory technology (RegTech). Thus, the business environment has become more dynamic, and this has created a new range of opportunities and threats for business units.

According to Lee et al. (2012), globalization has provided SMEs with new creative capacities to alter business models. However, the difference between the old and new business models is not evident. Therefore, there is often confusion between the concepts of SMEs and entrepreneurship (see Ríos-Manríquez et al., 2018). According to the conceptual framework by Covin and Slevin (1991), 'Entrepreneurship is described as a dimension of strategic posture represented by a firm's risk-taking propensity, tendency to act in competitively aggressive, proactive manners, and reliance on frequent and extensive product innovation'. However, the current study defines entrepreneurship as innovative and creative activities that seek to create benefits through the organization (which seeks to profit or non-profit) under its operations. In terms of strategic positioning, it aims to fulfil consumers' needs and gain competitive advantages by providing a product (good or service) that adds value for its stakeholders by creating a new value chain (tangible or intangible) in the society. The current study agrees with the findings of Covin and Slevin (1991) on the importance of strategic positioning, but not on the importance of the risk takers' attitude. This study adds a new dimension; it is the value chain tangible and intangible at the society in the concept of entrepreneurship.

SMEs, on the other hand, are not characterized by the addition of a value chain to the society. They are often replicated for other enterprises such as franchises. Therefore, SMEs in a loop in a value chain already exist. This is indirectly consistent with the results of Kuivalainen et al. (2012), who conducted a comparison between contemporary SMEs and the same SMEs from 10 years ago to examine how companies alter their designs. Such

changes are also determined by the global direction, development direction, capacity of communication, capacity for information production, and standardization of the marketing mix.

There are many obstacles and success factors for entrepreneurship (Timmons, 1978; McClelland, 1987; Ensher et al., 2000; Donald and Goldsby, 2004; Bitzenis and Nito, 2005; Fatoki and Chindoga, 2011; Ramoglou and Tsang, 2017; Sofer and Saada, 2017). What are the entrepreneurship obstacles? In what scenario can entrepreneurship succeed phenomenally? Phenomenal or large-scale success indicates rather strong economic growth, largely attributable to entrepreneurship (Lordkipanidze et al., 2005). Financial shortage is one of the main limitations of entrepreneurship, and it is a common obstacle identified by studies related to entrepreneurship. This study classifies financial obstacles into those that originate from banks and from other financial companies such as leasing companies.

This study does not agree with the results of Ghouse et al. (2019), who identified company requirements for entry by the government, availability of dedicated providers to stay ahead of competition, and elevated prices of raw materials. All these obstacles are related to economies of scale and enterprise size and not to entrepreneurship. This criticism can be explained by the fact that these factors are not only related to entrepreneurship, but also to the business environment, SMEs also represent these obstacles.

Another obstacle is lack of skills, such as management, accounting, analytics, creative, and negotiation skills. Therefore, the need for training and the existence of certain deficiencies in human skills are obstacles (Ladzani and Van Vuuren, 2002). That agrees with Kojo Oseifuah (2010). Students will obtain information and discover about their entrepreneurial skills that is effects of entrepreneurship education (Von Graevenitz et al., 2010). Development of these skills involves not only training but also education and family support (Adjei et al., 2019). Family relationships impact entrepreneurs' performance, and, according to Hendrajaya et al. (2019), although males are affected more by other males, females are affected more by other females, according to Markussen and Røed (2017) education increases students' entrepreneurial interest. In other words, entrepreneurship must be able to address the difficulties that new entrepreneurs face in achieving success by developing different skills (Tripathy, 2019). The education and training on entrepreneurial entry increases the long-term probability of start-up as well as entrepreneurial incomes, but no effect on enterprise survival (Elert et. al, 2015).

Governments seek to support entrepreneurship to create jobs, increase competition, and finally create wealth for individuals and countries (Michael and Pearce, 2009). However, is this support consistent and identical across countries? This study believes that this is not so. Because government policies and types of incentives vary across countries, according on fiscal and monetary policies in a country, as well as different business environment and business cycle status among in this country. Very few studies (Jones and Butler, 1992; Kwong et al., 2019) have examined the dark side of entrepreneurship—the psychological dimension—involving, for example, cruel experiences during wars and the agency problem. So, the study going to investigation some of these dimensions.

In addition, study compares entrepreneurship between more than one African country, where the previous study included one country. (Peberdy, 2000; Ladzani and Van Vuuren, 2002; Robson et. al., 2009; Kojo Oseifuah, 2010; Hattab, 2014; Abou-Warda, 2016; Dakung et. al., 2017; Chikha and Jarboui, 2018; Salem and Mobarak, 2019).

1.3 Study problem

Based on the literature review, this study provides a framework (Figure 1) for determinants of entrepreneurship that constitutes three groups of factors. The first, obstacle factors, include banking, non-banking, and non-financial obstacles. The second, success factors, involve understanding the economic environment, determining market gaps, ensuring capital adequacy, and creating a stable cash flow. The third, business model characteristics,

include benefits for clients, suppliers, founders, investors, and stockholders. This study believes there is a relationship between the second and third groups, which adds value chain to the society. This new value chain, whether tangible or intangible, is the motivation behind success, by meeting the desire of customers through a different methodology that did not exist beforehand. This value chain Possible be lower costs of acquiring products or introducing a different product which increases customer satisfaction, it has led market forces to move towards this business model with support from stakeholders.
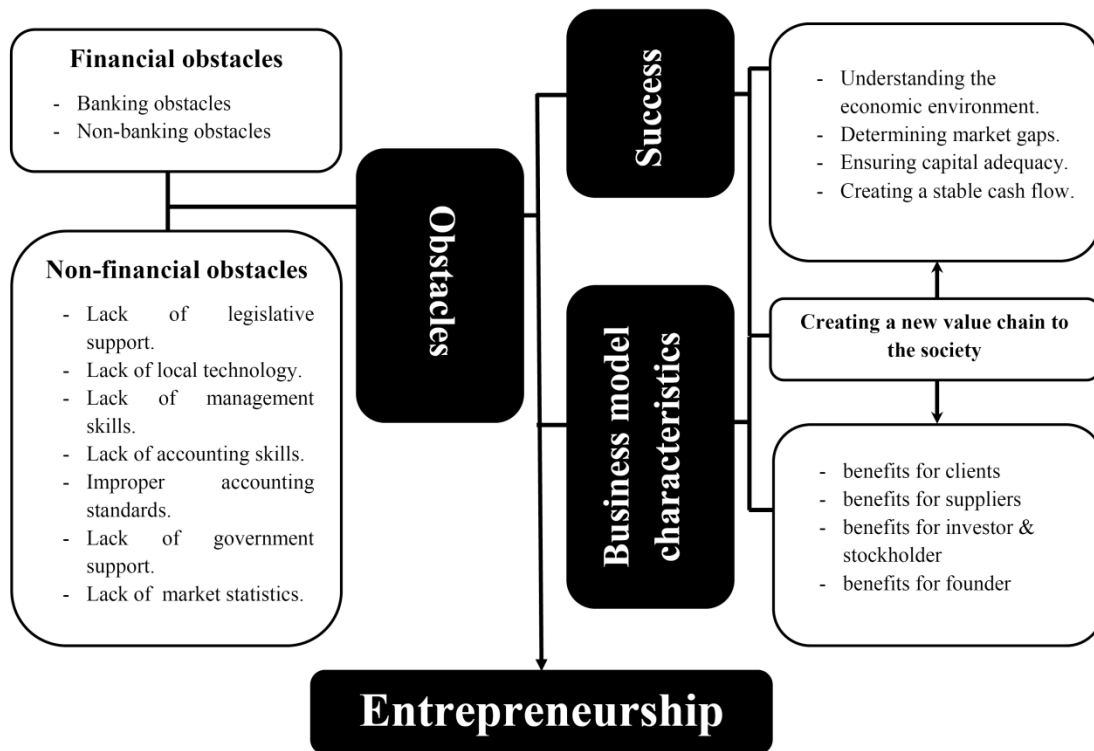
Figure 1. Framework for determinants of entrepreneurship
Source: Authors

Figure 1 shows that there are three sets of factors that influence entrepreneurship. Considering that the society includes Egypt and Nigeria, the study problem can be identified as follows:

  a. What are the entrepreneurship obstacles in Africa in general and in Egypt and Nigeria in particular?
  b. Are there differences in the entrepreneurship obstacles in Egypt and Nigeria?
  c. What are the entrepreneurship success factors in Africa in general and in Egypt and Nigeria in particular?
  d. Are entrepreneurship success factors different between Egypt and Nigeria?
  e. What are the business model characteristics for entrepreneurship success in Africa in general and in Egypt and Nigeria in particular?
  f. Are there differences in the business model characteristics for entrepreneurship success in Egypt and Nigeria?

The following are additional questions to be addressed:

  g. What are the future directions of entrepreneurship in Africa in general and in Egypt and Nigeria in particular?
  h. Are the future directions of entrepreneurship different between Egypt and Nigeria?
  i. Are the future directions of entrepreneurship different according to age?

1.4 Hypotheses

Based on the study problem and the literature review, the following hypotheses are presented:

H_1: There is a significant difference in entrepreneurship banking obstacles between Egypt and Nigeria.

H_2: There is a significant difference in entrepreneurship non-banking obstacles between Egypt and Nigeria.

H_3: There is a significant difference in entrepreneurship non-financial obstacles between Egypt and Nigeria.

H_4: There is a significant difference in entrepreneurship success factors between Egypt and Nigeria.

H_5: There is a significant difference in business model characteristics for entrepreneurship success between Egypt and Nigeria.

H_6: There is a significant difference in the future directions of entrepreneurship between Egypt and Nigeria.

H_7: There is a significant difference in the future directions of entrepreneurship according to age.

1.5 Study objective

This study investigates the obstacles, success factors, and business model for entrepreneurship, as well as their future directions in Africa in general and in Egypt and Nigeria in particular.

1.6 Study importance

Entrepreneurship is one of the factors leading to growth of both the economy and national assets. (Lordkipanidze et al., 2005) Entrepreneurship can change the lifestyle and create value, jobs, and conditions for a prosperous society. Therefore, the current study focuses on entrepreneurship, its obstacles and success factors, and whether it plays an important role in achieving sustainable development and sustained economic growth.

2. Data Description and Hypotheses Testing

2.1 Data collection

The purpose of this study is to investigate the attitudes of founders, investors, corporate managers, academics, and graduates who seek a new project in Egypt and Nigeria to identify the determinants of entrepreneurship, that is, its obstacles and success factors. The different dimensions of obstacles and success, as reported in this study, were identified by reviewing prior literature on this issue, in addition to conducting interviews with stakeholders for the first stage of the study (building the framework of the study). But in the second stage of this study (hypothesis test) used the questionnaire instrument; 466 questionnaires were sent, and 395 questionnaires were received, with a response rate of 84.76%. Table 1 summarizes the number of participants in the survey. The study uses parametric and non-parametric tests to obtain statistical inferences for the study hypotheses.

Table 1. Survey participants

No.	Country	Number	Weight
1	Egypt	286	72.4%
2	Nigeria	109	27.6%
	Total	**395**	**100%**

Source: Authors according to the manual and electronic distribution of the survey.

2.2 Reliability statistics

The Cronbach's alpha coefficient of the received questionnaires was 0.8059, and the standardized-item alpha was 0.8209. Thus, the study found indicators of stability of the statistical tests' results.

2.3 Data description

The current survey has four main dimensions: entrepreneurship obstacle factors, entrepreneurship success factors, business model characteristics for entrepreneurship success, and future directions of entrepreneurship. That the sample from Egypt and Nigeria have a normal distribution; so the study ability to Applied Kruskal-Wallis test and One-way analysis of variance (ANOVA) test; next sections show Mean, standard deviation and coefficient of variation for each statement.

2.3.1 Entrepreneurship obstacles factors

Table 3 presents data on the entrepreneurship obstacle factors. This table displays values of the mean, standard deviation, and coefficient of variation.

Table 2. Descriptive statistics of entrepreneurship obstacles factors

No.	Statement: Entrepreneurship obstacle factors	Mean	Std. deviation	Coefficient of variation
1	Lack of legislative support for the start-up	3.850633	1.020335545	0.264979
2	Lack of legislative support for technology mechanisms	3.883544	0.896472271	0.230839
3	Lack of legislative support for non-traditional companies	3.693671	1.024985053	0.277498
4	Weak local technology	3.724051	0.975488318	0.261943
5	Difficulties in bank financing	3.835443	1.000385455	0.260827
6	Difficulties in non-bank financing such as in leasing	3.774684	1.006258128	0.266581
7	Difficulties in listing on the stock exchange	3.762025	1.019642592	0.271036
8	Lack of management skills	3.893671	1.051387984	0.270025
9	Lack of accounting skills	3.531041	1.079387922	0.305685
10	Improper accounting standards	3.465427	1.094854551	0.315936
11	Lack of government support	3.987342	0.943770262	0.236692
12	Lack of market statistics	4.065823	0.966820903	0.237792
D1	**Entrepreneurship obstacles**	**3.847088608**	**0.529160219**	**0.137548228**

Source: Statistical Package for the Social Sciences output.

According to Table 2, the participants were in agreement regarding the entrepreneurship obstacles at the rate of 86.7%. The agreement was the highest for 'Lack of legislative support for technology mechanisms' but the lowest for 'Improper accounting standards'.

2.3.2 Entrepreneurship success factors

Table 3 presents the data on entrepreneurship success factors. This table displays values of the mean, standard deviation, and coefficient of variation.

Table 3. Descriptive statistics of entrepreneurship success factors

No.	Statement: Entrepreneurship success factors	Mean	Std. deviation	Coefficient of variation
1	Understanding the economic environment	3.941772152	0.973846786	0.247058112
2	Determining market gaps	3.99821597	0.872594591	0.218245987
3	Ensuring capital adequacy	3.875949367	0.919227107	0.237161794
4	Creating a stable cash flow	3.989873418	0.928892542	0.232812534
5	Adding value to the society	4.091139241	0.932654891	0.227969481
D2	**Entrepreneurship success**	3.979746835	0.601516642	0.151144449

Source: Statistical Package for the Social Sciences output.

According to Table 3, the participants were in agreement regarding the entrepreneurship success factors at the rate of 84.9%. The agreement was the highest for 'Determining market gaps', but lower for 'Understanding the economic environment'.

2.2.3 Business model characteristics for entrepreneurship success

Table 4 presents data on the business model characteristics for entrepreneurship success. This table presents values of the mean, standard deviation, and coefficient of variation.

Table 4. Descriptive statistics of nusiness model characteristics for entrepreneurship success

No.	Statement: Business model characteristics for entrepreneurship success	Mean	Std. deviation	Coefficient of variation
1	Added value for the society	3.873418	1.103376091	0.284858533
2	Benefits for clients	3.936709	0.939026553	0.238530861
3	Benefits for suppliers	3.95443	0.90567829	0.229028761
4	Benefits for investors and stockholders	3.875949	0.835326495	0.215515327
5	Benefits for the founder	4.002532	0.965124684	0.241128558
D3	**Business model characteristics for entrepreneurship success**	3.928608	0.644592371	0.164076548

Source: Statistical Package for the Social Sciences output.

According to Table 4, the participants were in agreement regarding the business model characteristics for entrepreneurship success at the rate of 83.6%. The agreement was the highest for 'Benefits for investors and stockholders' but lower for 'Added value for the society'.

2.2.4 Future directions of entrepreneurship

Table 5 presents data on the future directions of entrepreneurship. This table presents values of the mean, standard deviation, and coefficient of variation.

Table 5. Descriptive statistics of future directions of entrepreneurship

No.	Statement: Future directions of entrepreneurship	Mean	Std. deviation	Coefficient of variation
1	Industrial production	3.807594937	1.053610201	0.276712785
2	Agricultural production	3.448101266	1.163844142	0.337531892
3	Services	4.035443038	1.019485037	0.252632741
D4	**Future directions of entrepreneurship**	3.763713079	0.788295477	0.20944622

Source: Statistical Package for the Social Sciences output.

According to Table 5, the participants were in agreement regarding the future directions of entrepreneurship at the rate of 79.06%. The agreement was the highest for 'services' but lower for 'Agricultural production'.

2.3 Hypotheses testing

This study used a one-way analysis of variance test as well as a Kruskal-Wallis test to examine the hypotheses.

2.3.1. Examining the difference in entrepreneurship banking obstacles between Egypt and Nigeria

Table 6. One-way analysis of variance (ANOVA) output for entrepreneurship banking obstacles for Egypt and Nigeria

		Sum of Squares	DF	Mean Square	F	Sig.
Entrepreneurship banking obstacles	Between Groups	0.824	1	0.824	0.823	0.365
	Within Groups	393.48	393	1.001		
	Total	394.304	394			

Source: Statistical Package for the Social Sciences output.

The previous statistical results show F value was (0.823); it isn't significant at 0.05 levels. So; table 6 show the general tendency to face the same entrepreneurship banking obstacles. In other words, this study did not find a difference in entrepreneurship banking obstacles between Egypt and Nigeria.

2.3.2. Examining the difference in entrepreneurship non-banking obstacles between Egypt and Nigeria

The next statistical results show F value was (4.469); it is significant at 0.05 levels. So; table 7 shows the general tendency to face different entrepreneurship non-banking obstacles. In other words, this study found a difference in entrepreneurship non-banking obstacles between Egypt and Nigeria. This difference is significant at the 0.05 level.

Table 7. One-way analysis of variance (ANOVA) output for entrepreneurship non- banking obstacles between Egypt & Nigeria

		Sum of Squares	DF	Mean Square	F	Sig.
Entrepreneurship non- banking obstacles	Between Groups	3.143	1	3.143	4.469	0.035
	Within Groups	276.411	393	0.703		
	Total	279.554	394			

Source: Statistical Package for the Social Sciences output.

2.3.3. Examining the difference in entrepreneurship non-financial obstacles between Egypt and Nigeria

The next statistical results show F value was (10.012); it is significant at 0.01 levels. So; table 8 show the general tendency to face different entrepreneurship non-financial obstacles. In other words, this study found a difference in entrepreneurship non-financial obstacles between Egypt and Nigeria. This difference is significant at the 0.01 level.

Table 8. One-way analysis of variance (ANOVA) output for the difference in entrepreneurship non-financial obstacles between Egypt and Nigeria

		Sum of Squares	DF	Mean Square	F	Sig.
Entrepreneurship non-financial obstacles	Between Groups	3.288	1	3.288	10.012	0.002
	Within Groups	129.062	393	0.328		
	Total	132.350	394			

Source: Statistical Package for the Social Sciences output.

2.3.4 Examining the difference in entrepreneurship success factors between Egypt and Nigeria

The next statistical results show F value was (0.170); it isn't significant at 0.05 levels. So; table 9 show the general tendency to have the same entrepreneurship success factors. In other words, this study did not find a difference in entrepreneurship success factors between Egypt and Nigeria.

Table 9. One-way analysis of variance (ANOVA) output for entrepreneurship success factors between Egypt and Nigeria.

		Sum of Squares	DF	Mean Square	F	Sig.
Entrepreneurship success factors	Between Groups	0.06175	1	0.0617	0.170	0.680
	Within Groups	142.496	393	0.3625		
	Total	142.558	394			

Source: Statistical Package for the Social Sciences output.

2.3.5 Examining the difference in business model characteristics for entrepreneurship success between Egypt and Nigeria

The next statistical results show F value was (0.209); it isn't significant at 0.05 levels. So; table 10 show the general tendency to have the same business model characteristics for entrepreneurship success. In other words, the study did not find a difference in business model characteristics for entrepreneurship success between Egypt and Nigeria.

Table 10. One-way analysis of variance (ANOVA) output for business model characteristics for entrepreneurship success factors

		Sum of Squares	DF	Mean Square	F	Sig.
Business model characteristics	Between Groups	0.08686	1	0.08685	0.209	0.648
	Within Groups	163.620	393	0.41633		
	Total	163.707	394			

Source: Statistical Package for the Social Sciences output.

2.3.6 Examining the difference in future directions of entrepreneurship between Egypt and Nigeria

The next statistical results show F value was (0.051); it isn't significant at 0.05 levels. So; table 11 show a general tendency to have the same future directions of entrepreneurship. In other words, this study did not find a difference in future directions of entrepreneurship between Egypt and Nigeria.

Table 11. One-way analysis of variance (ANOVA) output for future directions of entrepreneurship

		Sum of Squares	DF	Mean Square	F	Sig.
Future directions of entrepreneurship	Between Groups	0.03155	1	0.0315	0.051	0.822
	Within Groups	244.8038	393	0.6229		
	Total	244.8354	394			

Source: Statistical Package for the Social Sciences output.

2.3.7 Examining the effect of age on the future directions of industrial entrepreneurship

The next statistical results show Chi-Square value was (16.831); it is significant at 0.01 levels. So; table 12 show the general tendency to have different future directions of industrial entrepreneurship. In other words, the study found a difference in future directions of industrial entrepreneurship according to age that is significant at the 0.01 level.

Table 12. Kruskal-Wallis output for the effect of age on future directions of industrial entrepreneurship

	The future directions of industrial entrepreneurship
Chi-Square	16.831
df	4
Asymp. Sig.	0.002

a   Kruskal Wallis Test
b   Grouping Variable: C1
Source: Statistical Package for the Social Sciences output.

2.3.8 Examining the effect of age on future directions of agricultural entrepreneurship

The next statistical results show Chi-Square value was (19.294); it is significant at 0.01 levels. So; Table 13 show the general tendency to have different future directions of agricultural entrepreneurship. In other words, the study found a difference in future directions of agricultural entrepreneurship according to age that is significant at the 0.01 level (Table 14).

Table 13. Kruskal-Wallis output for the effect of age on the future directions of agricultural entrepreneurship

	The future directions of agricultural entrepreneurship
Chi-Square	19.294
df	4
Asymp. Sig.	0.001

a   Kruskal Wallis Test
b   Grouping Variable: C1
Source: Statistical Package for the Social Sciences output.

2.3.9 Examining the effect of age on future directions of service entrepreneurship

The next statistical results show Chi-Square value was (22.160); it is significant at 0.01 levels. Table 14 show the general tendency to have differences in future directions of service entrepreneurship. In other words, the study found a difference in future directions of service entrepreneurship according to age, which is significant at the 0.05 level (Table 15).

Table 14. Kruskal-Wallis output for the effect of age on the future directions of services entrepreneurship

	The future directions of services entrepreneurship
Chi-Square	22.160
df	4
Asymp. Sig.	0.000

a   Kruskal Wallis Test
b   Grouping Variable: C1
Source: Statistical Package for the Social Sciences output.

3. Conclusions and Recommendations

3.1 Study Conclusions

There is often confusion between the concepts of SMEs and entrepreneurship (Lucky and Olusegun; 2012), which can be addressed by the convergence of research topics and characteristics. According to current study, entrepreneurship has the ability to add a value chain to the society, which is not generally true for SMEs. This finding agrees with Lee et al. (2012) and Kuivalainen et al. (2012). In addition, this study finds that entrepreneurship is valid even for non-profit projects. This agrees with Morris et al. (2007).

This study provides a framework for the determinants of entrepreneurship, classified into three groups of factors: obstacle factors, success factors, and business model characteristics. This study assumes that there is a relationship between the second and third groups, which adds value to the society.

Participants of the study were in agreement regarding the entrepreneurship obstacles—which include financial and non-financial obstacles—at the rate of 86.7%. However, the rate of agreement for success factors—which include understanding the economic environment, determining market gaps, ensuring capital adequacy, and creating a stable cash flow—was 84.9%. Finally, the rate of agreement for business model characteristics—which include benefits for clients, suppliers, founders, investor, and other stakeholders—was 83.6%.

According to the stakeholders, there is no difference in entrepreneurship banking obstacles between Egypt and Nigeria, but a difference exists in entrepreneurship nonbanking and non-financial obstacles, which is significant at the 0.05 level.

The banking sector in Egypt and Nigeria has maintains effectiveness according to the Basel I, II, and III norms according to development of Regulatory Restrictions (Ozili, 2015; Helmy and Wagdi, 2019). The reason for the difference in nonbanking obstacles is likely the level difference of efficiency of the Egyptian Exchange and the Nigerian Stock Exchange (Jefferis and Smith 2005) and non-banking services such as leasing and securitization, since traditional bank lending has slowed down, it has become essential to develop non-bank funding (Rateiwa and Aziakpono, 2017), but the reason for the difference in nnon-financial obstacles back to the differences in legal environments and levels of corruption between Egypt and Nigeria (Cilliers et al., 2015).

The study did not find differences in entrepreneurship success factors, business model characteristics for entrepreneurship success, and future directions of entrepreneurship between Egypt and Nigeria. The similarity of results can be explained by the similarity in the two countries' education level and investment awareness.

3.2 Study Recommendations
Entrepreneurship has attracted many groups of stakeholders, both individual, institutional, in addition to government of countries. Some stakeholders consider entrepreneurship as a mechanism to support sustainable development by adding value to the society. Therefore, this study recommends the participation of a number of parties to support entrepreneurship.

These parties include the following: (1) Family: Family, along with educational institutions, help develop creative skills and provide support in the ethical dimension, such as psychological support and support for entrepreneurship and participation. (2) Educational institutions: These help in developing skills in the fields of management, accounting, information technology, data analytics, creativity, negotiation, etc. (3) Government & parliament: This helps in developing the legal environment in addition to providing tax incentives. (4) Professional institutions: Institutions such as the Financial Accounting Standards Board (FASB) and Institute of Management Accountants (IMA) aid in the development of professional and regulatory restrictions. (5) Financial authorities: These support entrepreneurship programs along with financial institutions. (6) Financial institutions: These include venture capital funds, among others. (7) Business nurseries: These provide logistic and technological support (see Figure 2).
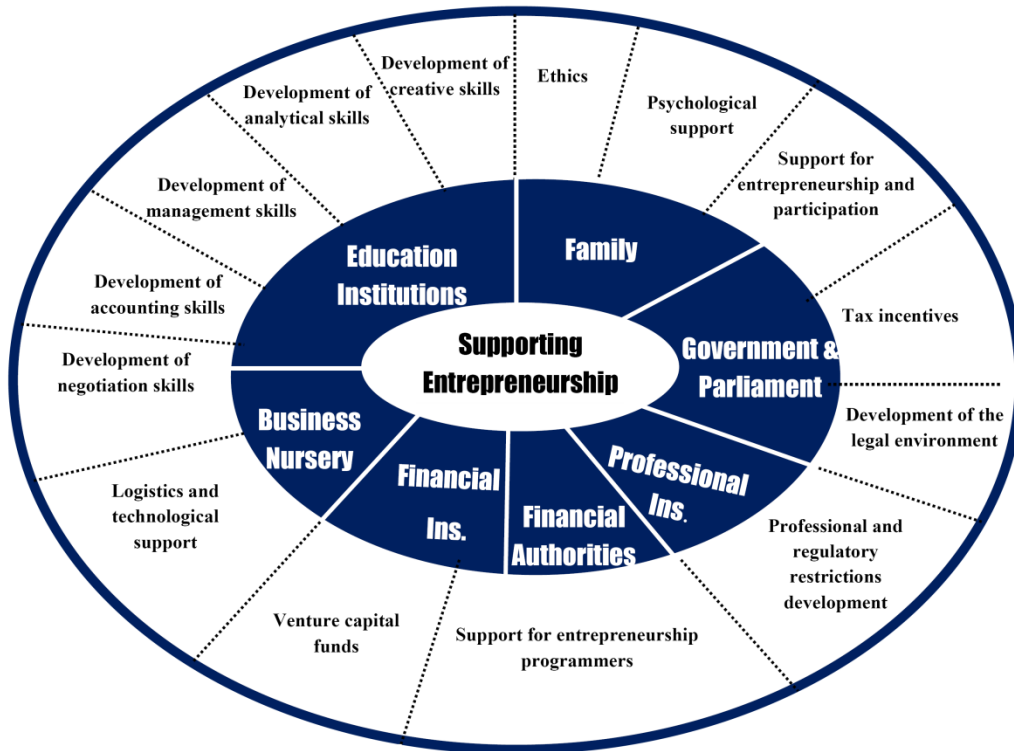
Figure 2. Framework for supporting entrepreneurship
Source: Authors

Moreover, the study finds that, currently, academic research is still at the beginning stage in Africa. Therefore, in addition to a focus on the aspects of financial technology, this study suggests the following lines of future research:

a. Nonprofit entrepreneurship
b. Entrepreneurship and agency problem
c. Determinants of initial public offering entrepreneurship
d. Risk assessment of entrepreneurship
e. Impact of corruption on entrepreneurship
f. Accounting standards for entrepreneurship
g. Entrepreneurship under RegTech

In the end, African governments and international organizations should develop an entrepreneurial support program tailored to the specificities of each country, which vary in the banking system, financial markets, business ethics and business environment, as well as social characteristics. But the important dimension of entrepreneurial support program is creating a new value chain (this value be a tangible and/or intangible) with get stakeholder support; that is role of education institutions.

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KNOWLEDGE INTEGRATION CAPABILITY AND ENTREPRENEURIAL ORIENTATION: CASE OF PAKTHONGCHAI SILK GROUPS RESIDING[*]

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Abstract. This qualitative research aimed to study 1) knowledge integration capability and 2) knowledge integration capability that demonstrated the entrepreneurial orientation within the silk groups in Pakthonghai District, Nakhon Ratchasima Province. Supporting research data was collected from in-depth interviews of six silk group leaders and members (out of eleven identified groups). A content analysis method was used for data evaluation in order to find evidence-based inferences, identify causal relationships, and investigate the correlations. According to the result, the silk groups' knowledge integration capability was built upon the following three perspectives: learning culture, knowledge management capability and information technology skill. 1) Learning Culture derived from the groups' determination to produce and maintain high quality standards in their silk products while making use of knowledge learned from customers, competitors, governments, and previously experienced business problems. 2) Knowledge management capability described the ability to retain knowledge inherited from previous generations and exchange information among group members during training and practice. Once the new set of knowledge was created by a member, it was then relayed to other group members and used to develop their silk products according to the market demand. 3) Information technology had been used by Pakthongchai silk groups to manage their silk production knowledge. These established elements had assisted them in obtaining an outstanding entrepreneurial skills.

Keywords: knowledge integration capability; entrepreneurial orientation; silk group; Pakthongchai District

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1. Introduction

Textiles are one of the highest revenue generating industries in Thailand with the value of export accounted for 3.4% of national GDP. According to the report from the Queen Sirikit Department of Sericulture, Thailand silk market's trading value in 2014 increased 76.26% from 2013, equivalent to approximately 6 billion Thai Baht (the Queen Sirikit Department of Sericulture, 2013). "Nakhonchaiburin" is a silk group consisting of four high-potential silk producers and sellers in the lower north-eastern regions, including Nakhon Ratchasima province, Chaiyaphum province, Burriram province, and Surin Province. Among the four provinces, Nakhon Ratchasima owns the largest market share (Lower North-eastern Region Group, 2011).

Nakhon Ratchasima is known as the producer of "Hang Karok silk" (tail of a squirrel), one of the most exquisite silk fabrics. It is a type of plain silk made by special weaving techniques in which two different colors of threads are twisted in to one. This requires skilled weavers to control the shade of the overlay color to achieve the small intrinsic pattern that glistens like the fluffy tail of a squirrel. Hang Karok silk was once regarded as the silk of Nakhon Ratchasima. As the old province motto says "lace neck dove, Kan Rom sugar cane, green mandarin orange, Hang Karok silk, Sai Thong flower, and Si Sawat cat. Although the motto has been changed to "land of brave women, fine silk material, Korat rice noodle, Phimai historical park, and Dan Kwian ceramics", silk remains the renowned product of Korat City. The weaving culture has existed in Nakhon Ratchasima for over 100 hundred years (Information Technology and Communication Center, the Queen Sirikit Department of Sericulture, 2018). More than 200 small producers from upstream, midstream and downstream industries generated over 4.1 billion Thai Baht in 2012. With the government's promotion campaign that encourages the use of Thai fabric and the increasing purchase volume from ASEAN customers, the industry is expected to grow an additional 50%.

However, silk production in Korat is struggling to maintain its artisanal tradition as weavers nowadays prefer using pre-manufactured, ready-made threads instead of those twisted by hand. Increasingly, alternative types of fabric and western-style clothing has also become more popular. Additionally, the textile industry has become more competitive due to the increase of producers from ASEAN countries. Myanmar has recently started to export its good to the ASEAN market. The silk production groups, therefore, have to find additional ways to expand their business if they hope to survive. Some of the contributing factors assisting their continued survival include the ability to promote learning among group members and the ability to integrate knowledge and to operationalize group knowledge dispersed among scattered individuals and documents. Combined with the ability to apply appropriate technological skill, the ability to gather and organize knowledge has enhanced the weavers' ability to produce high quality silk and run their businesses efficiently (Davenport & Klahr, 1998). Entrepreneurial orientation is also an essential skill used for solving business problems. It has allowed the silk groups to employ strategic decision-making capabilities across their industry (Kim, Song, Sambamurthy, & Lee, 2012). Without the continued democratization and exchange of silk making wisdom, the traditional industry will increasingly face aggressive competitive challenges, decreasing market demand for their product. The group must also remain unique by continuing to produce innovative patterns, using silk diversely and contemporarily while still preserving traditional Thai identity. These are the methods used to strengthen the group members' learning ability and allow them to increase the value of their products.

The policy of the Queen Sirikit Department of Sericulture, Ministry of Agriculture and Cooperatives emphasizes the importance of wisdom integration and silk weaving knowledge distribution. The wisdom exchange process and knowledge passing from handicraft experts serves as the foundation for creating unique patterns during production process. This uplifts the silk group's competitive skills in both domestic and international markets. This research's objectives were to study knowledge integration capability and knowledge integration capability which indicates an entrepreneurial orientation. The selected case study included silk groups from the Pakthongchai District, Nakhon Ratchasima province. These groups had maintained their silk weaving tradition for over 50 years and were renowned for their high quality and artistic silk products. The study aimed to review and further understood the silk groups'

knowledge integration and entrepreneurial orientation. Expectedly, the government can make use of the study result as a guideline to improve the Thai silk industry regarding this particular topic in the future.

2. Literature Review

The relevant concepts, theories and research to this study can be summarized into two sections as follows.

2.1 Knowledge management capability

Knowledge management is the capability to obtain, apply, transform and aggregate organizations' internal and external sources of expertise in order to increase competitive positioning. It consists of knowledge analysis, knowledge synthesis, experience application, and a knowledge selection process (Xiao-di, Song-zheng, Juanru & Heng, 2008).

Grant (1996) developed knowledge integration theory in order to explain how the process of integration leads to the construction of new knowledge and is dictated by two mechanisms; (1) the instructions and routines of an organization as well as (2) an effective ability of employees to segregate, apply, and enhance various knowledge gained internally and externally.

Knowledge within the organization is constructed during the knowledge integration capability and knowledge management processes. The knowledge management process includes knowledge building, exchange, relay, and dissemination. On the other hand, knowledge integration capability consists of the three alternative dimensions of (a) a learning culture, (b) the knowledge management process capability, and (c) an information technology capability (Kim, Chaudhury, & Rao, 2002; Ray, Barney, & Muhanna, 2004). The details are as follows:

    1. Learning Culture (LC)

Culture is described by knowledge values, the interaction of people within a society, the types of knowledge embedded an organization, and knowledge activities accepted within those organizations (Gold, Malhotra, & Segars, 2001; Lee & Choi, 2003). Whereas, LC is comprised of values and beliefs demonstrated through the behaviours of both groups and individuals during the new knowledge development process. This process consists of mind opening, trusting, coordination, and assisting each other to improve an organization's efficiency and effectiveness (Škerlavaj, Štemberger, Škrinjar & Dimovski, 2007) by encouraging or supporting the team effort to create organizational innovations.

    2. Knowledge Management Process Capability (KMPC)

Knowledge integration can be achieved through two different mechanisms: routines and instructions. 1) Routines are used to determine relationships among employees. Successful integration occurs when employees are able respond to the situations without requiring prior instruction. 2) Instructions are the integration mechanism created by each individual expert. They are used to determine rules, criteria, and instruction sets for an organization that lacks clear work processes or structures. Both mechanisms refer to knowledge resident within individuals or organizations in the form of social or organizational behaviours (Xiao-di, Song-zheng, Juanru & Heng, 2008). Additionally, knowledge management processes are the ability to create and share the knowledge of organizations as well as individuals. These processes allow for each employee to access knowledge through communication with others (Brown & Duguid, 2001; Gold, Malhotra, & Segars, 2001; Lee & Choi, 2003). However, the knowledge management process has to be established along with an organizational culture in order to increase integration. This allows the knowledge management process to help select the most valuable knowledge within an organization. An organization's LC and knowledge management are the primary factors that promote knowledge integration and information technology capabilities, which are essential for constructing rules and instructions (Kim, Chaudhury & Rao, 2002; Ray, Barney & Muhanna, 2004).

    3. Information Technology Capability (ITC)

ITC describes the capability to effectively manage hardware and software in order to enable user access to different levels of knowledge. Information technology skills facilitate transformation of knowledge, from both

routine work and instructions, into the effective actions (Kim, Kang, Lawrence & Tom, 2008; Armour, 2000, 2001). The knowledge management process is a part of knowledge integration capability. Together with LC, it enables profound knowledge construction in an organization. An organization, therefore, has to conglomerate its knowledge integration in order to effectively promote the knowledge management process (Kim, Song, Sambamurthy, & Lee, 2012). Moreover, an organization's performance is clearly linked to the relationship between information technology and knowledge management capabilities. This includes product knowledge management, customer knowledge management, and knowledge capability management (Tanriverdi, 2005).

2.2 Entrepreneurial orientation

Li, Huang, & Tsai (2009) and Lee & Peterson (2000) study entrepreneurial orientation in five broad perspectives, namely innovation capability, risk taking, proactiveness, competitive aggressiveness and autonomy. 1) Innovation capability is new concept describing the utilization new technologies or processes to create new products and services. 2) Risk taking describes leveraging resources into opportunities when encountering new and unique challenges. 3) Proactiveness is the pre-emptive response process used to outperform market competitors. 4) Competitive assertiveness is a business strategy that aims to take risks with the aim of creating the opportunities while problem solving. 5) Autonomy is the freedom of action provided to an individual or team to introduce new ideas responsive to market opportunities.

In order to promote risk management ability and organization's high performance, new entrepreneurs or businesses should be identified with good entrepreneurial orientation capability, namely freedom to think and work, reasonable risk taking, proactiveness, the determination to outperform competitors, and innovation. The innovation ability should be emphasized as a driving force of the organization to invent new ideas and to create a difference in the products according to the market demand (Jiraphanumes, Aujirapongpan, & Chamchang, 2011; Peng, Michael & Xiaofeng, 2016). Hult, Snow and Kandemir (2003) mention that new entrepreneurs who are heavily featured with entrepreneurial orientation skills, particularly innovative capability, tend to perform better than the entrepreneurs who are not.

In the contemporary workplace, organizations are incentivized to systematically search, build, gather and refine knowledge accessible to all employees. Personnel, including both staff and executives must learn and apply work knowledge consistently and continuously. This does not only promote sustainable growth but also encourage organisational survival through constantly evolving completion. As a result, it can be concluded that knowledge integration capability is one of the indications of entrepreneurial orientation which has a consequential effect on the organization's performance.

3. Research Methods

This research was conducted qualitatively based on the ground theory research. Data collection was conducted through in-depth interviews with leaders and members from the silk groups which had been established 5 years or more. Some of the groups had an official commerce registration, while others did not. Based on a purposive sampling method, non-probability sampling techniques were used to select six out of eleven silk groups for the interview. Collected data was examined by content analysis method in order to create the evidence-based inference, to identify causal relationships, and to demonstrate the correlations.

4. Results

According to the interviews with silk group leaders and members in Pakthongchai District, Nakhon Ratchasima province, silk production knowledge essentially derived from tacit knowledge. Knowledge management and accumulation occurred in the form of inheritance from ancestors. The learning process took place from one

generation and was passed onto the next generation, from parents to children and from children to grandchildren. People absorbed the knowledge by watching their parents, practicing weaving since a very young age, and eventually developing expertise as adults. They started from practicing with small looms, flying shuttle looms and large looms consecutively. Without notetaking or written evidence, explicit knowledge was continuously transferred through talking, knowledge exchange and knowledge immersion. This type of knowledge was relayed to other people only through verbal interaction. If a group member showed interest in learning how to weave silk, he/she were required to teach themselves. At present, the later generations have become disinterested in the silk weaving profession as a result of changing cultural attitudes. The perception exists that silk weaving is anti-social and no longer as economically viable. The opportunity cost of pursing silk weaving over other professions is perceived as too high, making practicing weavers lose better job opportunities. However, Psakthongchai district has maintained registration reports and built a museum for documenting the 100 years old trade with the goal of retaining the wisdom for future generations.

The results of the analysis of knowledge integration capability of silk group in Pakthongchai District, Na khon Ratchsima province can be explained in three dimensions: learning culture, knowledge management capability, and information technology skills. Each are described below.

1. *Learning Culture of silk groups in Pakthongchai District, Nakhon Ratchasima province*.
Learning knowledge including values and beliefs expressed as individuals and as a group. Within the silk weaving trade, learning knowledge was derived from the desire to produce silk with good quality and standards to meet the market demand. The knowledge development process of the groups, as a result, were focused on organizational innovation. This encouraged group members to collectively improve efficiency and effectiveness in business management. Apart from being inspired to use good quality materials and improve dyeing method to achieve a uniquely beautiful silk texture, the group members were also encouraged to promptly and collectively solve the problems even if the problems were minor.

The group's knowledge development processes can be described from various sources:
    1) Knowledge learned from customers
Participation in trade fairs gave the groups the opportunity to learn about customers' demands. Interacting with customers directly enhanced their understanding of current customers' needs and desires, including products' texture, color, design and pattern.
    2) Knowledge learned from competitors
The silk groups' business strategy was to study their competitors' products and then develop their own products to be more diverse and unique.
    3) Knowledge learned from government
Silk production and business operations training, arranged by the government, helped the groups to gain new knowledge that they used to increase business value. Silk products were introduced to new groups of customers by word of mouth. Additionally, the knowledge exchange and cooperation activities had turned rivalry silk groups in Pakthongchai District into business allies.
    4) Knowledge learned through problem solving
In the past, selling silk products through middlemen caused the group several problems. This included under-priced products, payment issues, and the failure to control the quality when delivering products in quantity. Instead of being dependent on the middlemen, the silk groups changed their business strategy by turning themselves into one of the competent competitors in the market. The groups worked collectively to handle price negotiation, manage sale activity in the retail stores, participate in trade fairs, and continuously adopted innovation to their silk product development.
The learning culture demonstrated by the silk groups from Pakthongchai District, Nakhon Ratchasima province can be summarized as follows (Diagram 1).
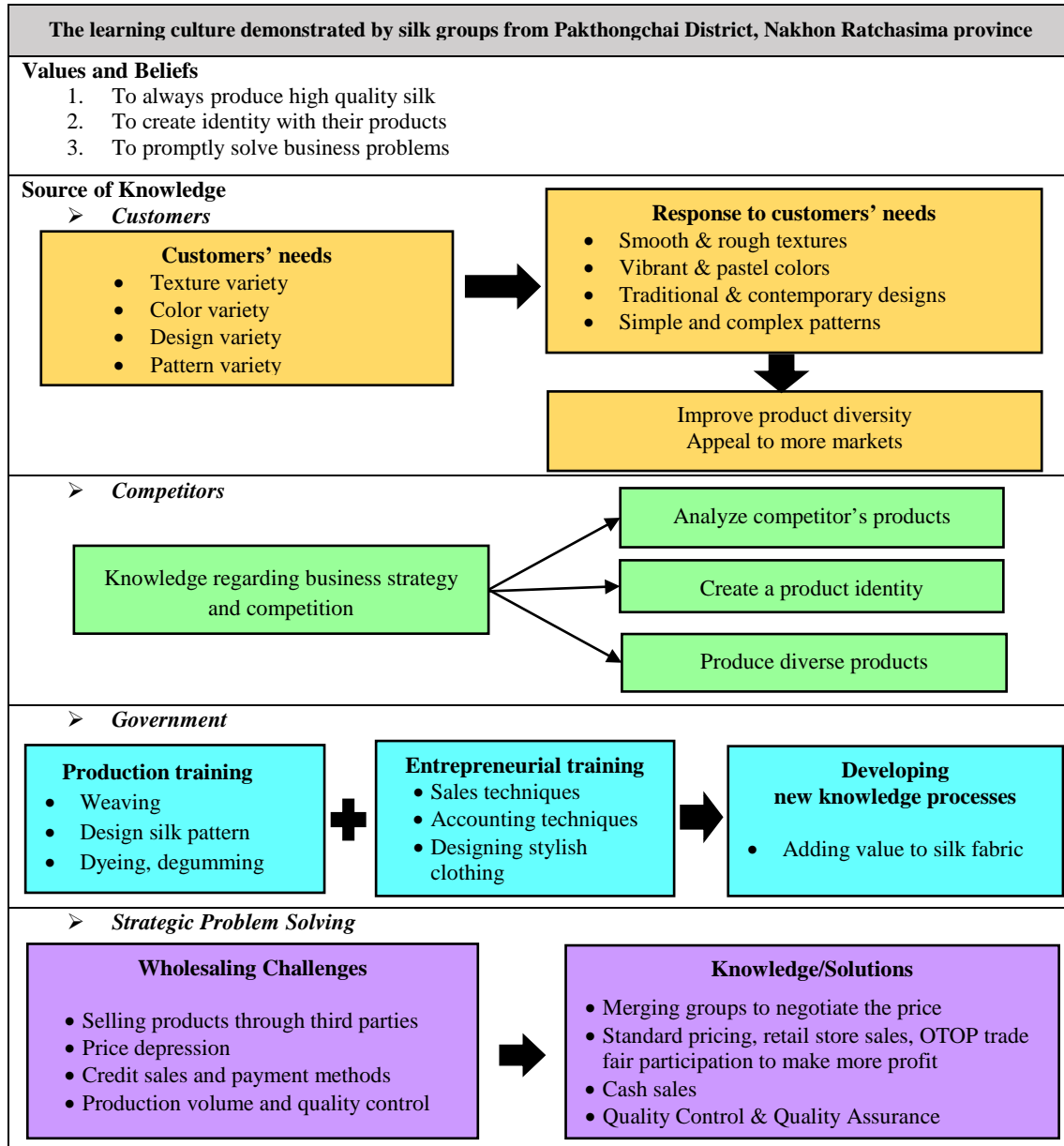
Diagram 1. Learning culture of silk groups in Pakthongchai District, Nakhon Ratchasima province

2. *Knowledge management capability of silk groups in Pakthongchai Districts, Nakhon Ratchasima province.*
The knowledge management capability of the silk groups was initiated and developed around the same time as their LC. The management process was conformed to knowledge management's concept and theory, starting from building, exchanging, relaying, and applying knowledge to the silk production in order to create high quality products and meet the market demand. The outcome of this process had assisted the group to be able to create more unique products. Their fabric was more firm, polished and properly dyed, and was certified as a high quality product by many organizations such as Queen Sirikit's Thai Silk Brand, the Queen Sirikit Department of Sericulture, 5 Star OTOP, Thai Community Product Standard, and well-known products from the Provincial Industry Office (Diagram 2).

Her Majesty Queen Sirikit graciously granted permission for the 'peacock' to be used as the brand or logo of quality assurance for four types of Thai silk, which are gold peacock (Royal Thai Silk), silver peacock (Classic Thai Silk, blue peacock (Thai Silk), and green peacock (Thai Silk Blend). The logo is designed to promote domestic and international recognition. The logo has been certified by 35 countries, including 27 European countries, China, Norway, the Philippines, Malaysia, United States of America, Singapore, India, and Hong Kong.

Knowledge Building

The production process
- Learn from ancestors, previous generations
- Learn from experts such as weavers and dyeing technicians
- Learn to design patterns by themselves
- Learn from village wisdom

Market demand
- Learn from interactions with customers when selling products or participating in trade fairs
- Learn from market survey activities
- Learn from knowledge training

Knowledge Exchange
- Story telling
- Casual conversation
- Discussion with a higher skilled individual
- Research and exchange of opinions

Knowledge Transfer
- Use the knowledge learned from the training to improve themselves and pass it on to other group members.
- Disseminate working knowledge to different groups of people such as farmers, matriarch groups, and students.

Knowledge Application
- Invent new types of fabric such as mixed cotton silk, nylon fabric
- Improve products to be more diverse
- Create new products from remnants
- Pattern innovation
- Combine colors to achieve a meticulous and outstanding pattern.
- Study the tendency of the color in market demand and adjust the products accordingly

Diagram 2. The knowledge management process within the silk groups from Pakthongchai District, Nakhon Ratchasima province.

3. *Information technology management capability within the silk groups in Pakthongchai Districts, Nakhon Ratchasima province*

The groups applied information technology management skill to facilitate and promote the infrastructure management and information technology management capabilities of their businesses.

The groups applied basic information technology skills to facilitate and promote their business in two aspects: production and marketing. Technology was applied to some silk production processes. However, mechanical interventions, such as motors, did not play an important part in hand woven silk production process, particularly

Mud-Mee silk which requires tying a single silk thread by hand to create a pattern. The groups used motor for basic tasks such as reeling and the spinning yarn process as it made the process faster and easier. Regarding marketing activities, the groups brought in young people with computer skills to help them update their product information or sell products through websites and online platforms such as Facebook and Line. The summary of information technology management capability within silk groups in Pakthongchai District, Nakhon Ratchasima province is shown in Table 1.

Table 1. The information technology management capability within silk groups in Pakthongchai District, Nakhon Ratchasima province

Infrastructure management	1. Using technology to facilitate production processes. 2. Using computer skills to promote marketing activities.
Information technology management capability	1. Selling products through the websites: 3/6 interviewed groups. 2. Selling products through Facebook, 3/6 interviewed groups. 3. Selling products through Line, 6/6 interviewed groups.

4. Knowledge integration capability, which indicates entrepreneurial orientation

Knowledge integration capability which indicates entrepreneurial orientation of silk groups in Pakthongchai District, Nakhon Ratchasima province is essentially the result of the group's collective LC and knowledge management process as explained below:

1) Innovation capability

Innovation capability described the outcome of LC and knowledge management among the silk groups. The desire to produce unique, high quality silk fabric drove the groups to learn and acquired new skills to improve their products. Knowledge was exchanged and utilized among the members and became a driving force for innovation. Innovations include the method of changing raw silk into soft silk, blending Mud-Mee silk with Hang Karok silk weaving technique, scented silk, water and fire resistant silk, remnant design, and using Khit technique to put Dok Mee pattern on Mud-Mee pattern and blending them with Hangkarok silk. (This weaving type is used to lift the line in each row up from one side to the other side of the fabric. The word "Khit" is Isaan dialect which means" to lift up". The characteristics of Khit-patterned cloth can be repeated with the high contrasting of two colors and same pattern throughout the fabric. For example, Black or dark blue with white, gold with green, red with white, etc. (the Queen Sirikit Department of Sericulture). Additionally, the groups also invented organizational processes derived from their problem solving experience during the wholesale activities. The groups used this innovation to increase efficiencies in business operations and enhance their management capabilities.

2) Risk-taking capability

Reasonable risk-taking ability is one of the most important qualities of high potential entrepreneurs. Silk belongs to the sensitive list product, which means that demand is not driven by consumer necessity. The fact that the silk groups decided to take risk by shifting their business strategy and changing the product design was a key factor that equipped them to be a more capable competitor in the market.

Pakthongchai District silk groups were reasonable risk-taking entrepreneurs. They had the courage to change silk patterns and business methods. They improved the uniqueness of their products, experimented to acquire new set of knowledge, and exchanged knowledge with other groups.

As a result, they successfully developed the model of business that can compete in the market. They were able to produce outstanding products that meet market demands. This was borne of LC and knowledge management capabilities developed through the groups' valiant, fearless, and flexible personalities. Including the belief that every business problem requires prompt resolution, no matter how small. The continuous learning custom

combined with knowledge accumulated over 20 years led to the groups' decision to take a risk and differentiate themselves from their competitors.

3) Competitive Aggressiveness

Pakthongchai District silk groups were characterized as competitive and aggressive entrepreneurs. They strived to improve their business strategies in order to outperform and keep their competitors out of the same market. This was clearly demonstrated when the groups shifted their business model from wholesale to retail. Instead of focusing on high volume sales, they took small orders which allowed them to be able to control the product quality, provide different patterns and colors of products, and maintain their signature in every piece of their work. The competitive aggressiveness was the result of the silk groups' determination to maintain standardized and quality production, create uniqueness in their products, and be problem-solving oriented. The knowledge integrated from various sources transformed into the innovation which enabled the groups to produce outstanding silk fabric which was firm, polished and diversely designed. This allowed them to stay ahead of competitors and receive repeat business their customers.

4) Proactiveness

The silk groups proved proactive while attempting to turn business obstacles into business opportunities. They were deliberate, made a plan to improve the business strategy, focused on high quality silk production by using a quality source yarn, and maintained the pricing standards. The progression of the silk industry was also taken into consideration. Garments had to be stylish, wearable, soft and easy to take care of. The proactiveness was the result of the groups' capability to manage the knowledge learned from competitors' strategies and customers' demands. Therefore, the groups were able to provide customers with better products.

5) Autonomy

The silk groups provided freedom at workplace to all employees. Because each individual had different skills and experiences in designing silk patterns, he or she was able to creatively problem solve individually, as they occurred. Silk groups work as families, where business partners are treated with empathy as if they are brothers and sisters. The autonomy demonstrated by the groups developed from LC and knowledge management processes. As the groups' business concept was to differentiate themselves from their competitors and produce distinctive silk products, freedom had to be provided at the workplace to allow staff to adapt to the current changing market situation.

The entrepreneurial characters of the silk groups from the Pakthongchai District, Nakhon Ratchasima province can be summarized as competent, well-informed, able to create a clear identity of the products, capable of developing diverse patterns of products, and constantly improving themselves as shown in Table 2.

Table 2. Knowledge integration capability which indicates entrepreneurial orientation of the silk groups residing in Pakthongchai District, Nakhon Ratchasima province.

Innovation Capability	1. Changing raw silk into soft silk 2. Blending Mud-Mee silk with Hang Karok silk 3. Scented fabrics 4. Fire- and water-resistant fabrics 5. Remnant designs 6. Using Khit technique to put Dok Mee pattern on Mud Mee pattern and blend it with Hang Karok silk
Risk Taking	1. Strategic changes to both the business model and operations, enforcing the groups' product identity. 2. Courage to change through experimentation, learning and develop the products that are responsive to the market.
Competitive aggressiveness	The determination to develop business strategies within a competitive market 1. Improve the business operation to enhance competitiveness

	2. Integrate and managed knowledge, apply new sets of knowledge to design firm and polished fabric with new patterns, add variety to products with the uniqueness that challenges competitors.
Proactiveness	1. Anticipate problems and opportunities that might arise in the future based on the information at hand. 2. Make a plan to handle potential problems and prepare to take advantage from the potential opportunities. 3. Promptly respond to changing demand 4. Manage carefully and critically
Autonomy	1. Learn, collectively solve problems, and provide autonomy to employees 2. Empathize and value employees, treat each other like family members 3. Provide freedom as they are long-term valuable employees 4. Allow for artistic freedom
Characteristics of Pakthongchai silk entrepreneurial groups • Have a sound understanding of the trade • Create a clear identity for products • Develop diverse patterns • Continuous improvement	

5. Summary and Discussion

Fostering market innovation and knowledge acquisition and retention were crucial factors in maintaining a competitive edge. An organization incapable of learning and managing knowledge according to changing situations would have been unable to survive (Preecha, Jirawan, & Chalermchai, 2017; Sokół, & Figurska, 2017 2017). This drove the silk groups to transform their business strategy by integrating old knowledge with the current consumer demand, so they could stay competitive with changing markets. The integration between inherited knowledge, the expertise gained from learning and experimenting, and the knowledge exchanged internally and externally allowed the groups to continuously improve their silk production methods and processes. The ability of applying the concept of knowledge management to business strategies creation increased the efficiency and effectiveness in business operations. With this ability, organizations gain a competitive advantage (Preecha, Jirawan, & Chalermchai, 2017; Raudeliūnienė, Davidavičienė, & Jakubavičius, 2018).

By integrating a new set of knowledge with their working methods and business operations, the silk groups matured their organizational culture. The members of the groups were determined to increase the value of their products, so they thoroughly checked the silk quality in every single production process. Moreover, they also exchanged knowledge among themselves in order to strengthen their problem-solving skill and improve the efficiency of their business operation. Organizational culture played an important role in building intellectual capital and the organization's performance. Intellectual capital was directly related to entrepreneurship which was directly influenced the organization's performance.

Today, the market has become very competitive. There are more choices provided to consumers and more distribution channels, including domestic and international markets. Moreover, the market environment is also changing. All of the entrepreneurs, including the silk groups, have had to keep continuously improve their business in order to survive log-term. If the silks groups did not have basic knowledge, they would not be able to improve their goods and services to meet the current consumers' demand. They saw the importance of knowledge, knowledge management, and knowledge integration and leveraged it to gain a competitive advantage. Based on their determination to produce high-quality and unique silk products, the groups learned to identify consumers' demand and market situation by participating in trade fairs and sharing knowledge acquired between the groups. As a result, they were able to produce exactly what the customers needed. Similarly, Leekpai (2014) mentioned that market orientation, learning orientation, and entrepreneurial orientation were the factors that had direct and positive effects on their ability to innovate.

By attending training sessions funded by the government, the silk groups enhanced their understanding of how to create opportunity and compete in a market by adding value in products and services. Additionally, understanding their competitors' business strategies allowed them to focus on creating their signature silk products (Siriporn & Sreedara, 2014).

The entrepreneurial orientation of silk groups has been fundamentally influenced by the geographical conditions of north-eastern region. The area is a plateau, and as a result, people rarely migrate to other places. Isan people are sincere, kind hearted, peaceful and persevering. These personality traits have allowed people in Nakhon Ratchasima province to maintain over 100 years of silk weaving tradition from their ancestors. They constantly improve the quality of their silk products by adjusted product pattern, color and design to be more modern and suitable to daily life (Škerlavaj, Štemberge, Škrinjar, & Dimovski, 2007). Additionally, research has shown that silk group entrepreneurs have outstanding entrepreneurial orientation skills. They have been able to move organizational innovation forward, apply the knowledge they have to meet the market demand, develop internet marketing and manage risks in order to increase organizational efficiency and performance (Jiraphanumes, Aujirapongpan, & Chamchang, 2011; Hult, Snow & Kandemir, 2003).

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SUSTAINABILITY ORIENTATION AND SUSTAINABLE ENTREPRENEURIAL INTENTIONS OF UNIVERSITY STUDENTS IN SOUTH AFRICA[*]

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Abstract. Sustainability behaviour can be predicted by intentions. The study investigated the relationship between sustainability orientation (SO) and sustainable entrepreneurial intentions (SEI) of university students in South Africa. The study adopted a quantitative research design that involved the use of survey. The self-administered questionnaire method was used to collect data from the survey participants using the cross-sectional approach. The participants in the survey were final year undergraduate students of the Department of Business Management of two South African universities. Three hundred and one students participated in the survey. Reliability was measured using the Cronbach's alpha. The data analysis methods for the study were descriptive statistics, correlation and regression analysis. The results indicated that SO is a predictor of SEI of university students. Limitations, areas for further study and recommendations to improve the SO of university students focus on passive and active teaching methods of sustainable entrepreneurship.

Keywords: sustainable entrepreneurship; sustainability orientation; sustainable entrepreneurial intentions; university, students; South Africa

1. Introduction

The major focus of entrepreneurship is the discovery, evaluation and exploitation of the opportunities to create goods and services (Venkataraman, 1997; Shane & Venkataraman, 2000). The benefits of entrepreneurship are both financial and non-financial and can be examined from individual, business and national levels. The financial benefits of entrepreneurship include increase in cash flow, revenue and return on investment for individuals and businesses and improvement in employment and the gross domestic product of a country. Some of the non-financial benefits of entrepreneurship are independence, autonomy and improvement in the standard of living. Entrepreneurship helps to bring change and innovation and can lead to comparative advantage in international

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trade (Luke, Verrenynne & Kearins, 2007; van Praag & Versloot, 2008; Chirani, Farahbod & Pourvahedi; 2013; Dorobat & Topan, 2015). Despite the benefits associated with entrepreneurship in the past century, there are concerns that it has also brought about an increase in the level of income inequality and the degradation of the natural environment. Although traditional entrepreneurship has brought about many benefits, the world is faced with many social and environmental challenges. These include natural disasters, climate change, environmental pollution, crime and corruption. The net value of the benefits of entrepreneurship should include its social and environmental costs (Dean & McMullen, 2007. van Praag & Versloot, 2008; Zahra & Wright, 2016).

The environmental and societal challenges caused by entrepreneurship do not necessarily need to be solved through government intervention. Individuals and businesses have a prominent role to play in resolving these problems (Kurkertz & Wagner, 2010). Entrepreneurship can help to resolve the noted socio-environmental issues. The conclusion of environmental economics is that the degradation of the natural environment arose from market failure. Market imperfections such as externalities, inefficient firms, flawed pricing mechanisms and information asymmetries have contributed to environmental degradation. However, social and environmentally relevant market failures represent entrepreneurial opportunities. Entrepreneurial actors can achieve positive economic returns by exploiting social and environmentally relevant market failures through radical technologies and innovative business models. This has laid the foundation for sustainable entrepreneurship, a business model in which entrepreneurs can obtain economic rent while also improving social and environmental concerns. The traditional explanation of value creation as purely measured by economic profit has extended to include non-economic gains. Sustainable entrepreneurship allows entrepreneurs to obtain economic profits while also addressing environmental and social challenges (Dean & McMullen, 2007; Cohen & Winn, 2007; Sarango-Lalangui, Santos & Hormiga, 2018; Nhemachema & Murimbika, 2018).

Porter & Kramer (2011) argue for the concept of shared value as the guiding principle of business. Shared value focuses on the connection between economic and societal progress and has the power to unleash the next wave of business growth globally.

Sustainability orientation (SO) refers to businesses that focus on sustainability. Kuckertz & Wagner (2010) ascribe SO to entrepreneurs as individuals rather than to businesses. At the individual level, SO is the situation where the owner/manager of a business has a proactive orientation towards societal and environmental issues (Diehl, Greenvoss & Klee, 2015). Roxas & Coetzer (2012) describe SO as a business orientation that focuses a company's philosophy on doing business in a socially and environmentally sustainable way. Tran & Von Korflesch (2016) point out entrepreneurial behaviour can be predicted by intentions. The Theory of Planned Behaviour (TPB) (Ajzen, 1991) argues that intentions can be used to predict actual behaviour. TPB has been found to predict actual entrepreneurial behaviours (Hockerts, 2017). Sustainable entrepreneurial intention (SEI) refers to an individual's willingness to become a sustainability-oriented entrepreneur. SEI focuses on the intent to start a business that considers social and environmental issues (Kurkertz & Wagner, 2010; Sung & Park, 2018). The issue regarding the drivers of entrepreneurial intentions in sustainable entrepreneurship is pertinent (Vuorio, Puumalainen & Fellnhofer, 2018). While the entrepreneurial intentions of traditional entrepreneur has been well researched, there is limited academic evidence on intention formation in the field of sustainable entrepreneurship (Nhemachena & Murimbika, 2018; Vuorio et al. 2018) and from a developing country perspective (Hockerts & Wüstenhagen, 2010; Belz & Binder, 2015). The aim of this study is to examine the effect of individuals' sustainability orientation (SO) on the sustainable entrepreneurial intention (SEI) of university students. Today's young adults are more socially aware and environmentally and entrepreneurially conscious. University students are the future generation of a society and have a passion for looking at different career options including sustainable entrepreneurship. Graduates make up a large proportion of all entrepreneurially active individuals (Kurkertz & Wagner, 2010; Ip, Wu & Liu, 2017). This study will make a contribution to the literature on SO and SEI. First, this study focuses on SO from the perspective of a developing country where empirical studies where are relatively few. Second, the findings of empirical research on the effect of SO on SEI are inconclusive. Some

studies find a significant positive relationship, whilst other studies find an insignificant relationship (Kamal & Jameela; 2017; Sung and Park, 2018). The findings of this study can help universities and governments in their strategic and operational decision-making processes and policies to improve sustainability orientation. The paper is organised as follows: The literature on sustainability, sustainable entrepreneurship, SO and SEI is reviewed in the next section. This is followed by the explanation of the research methodology and the results. Finally, the conclusion and recommendations are presented.

2. Literature review

2.1 Sustainability
The concept of sustainability is a large and pervasive issue that currently defies a universal definition. Sustainability is a transdisciplinary field and there are many different views on what it is and how it can be achieved (Djordjevic & Cotton, 2011; Little, 2014). The idea of sustainability stems from the concept of sustainable development which became common language at the World's first Earth Summit in Rio in 1992. The Bruntland Report for the World Commission on Environment and Development (1992) defines sustainability as "*development that meets the present without compromising the ability of future generation to meet their own needs*". The World Commission on Environment and Development defines sustainability as "*a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations*". Sustainability is the way an organisation creates value for its owners and society by maximising the positive and minimising the negative effects of social, environmental and economic issues (Accenture, 2011).The idea of sustainability having three dimensions can be linked to the Triple Bottom Line (TBL) concept by Elkington (1994). TBL incorporates three dimensions of performance namely financial, social and environmental and captures the essence of sustainability by measuring the full impact of an organization's activities including its profitability and its environmental and social capital (Slaper & Hall, 2011).

2.2 Sustainable entrepreneurship
The initial research on sustainable entrepreneurship (SE) focused on the relationship between entrepreneurial activity and environmental problems and solutions. Gradually the term became broader and closer to the TBL and that businesses need to be aware of the impact of their activity from an environmental and a social perspective (Sarango-Lalangui et al. 2018). Researchers often use sustainable entrepreneurship as synonymous to environmental entrepreneurship and ecopreneurship (Binder & Belz, 2015). Other researchers hold SE as the link between economic, environmental and social value creation (Kuckertz & Wagner, 2010; Patzelt & Shepard, 2011). There is no universal consensus on the exact meaning of the construct SE (Tarnanidis & Papathanasiou, 2015). According to Tilley &Young (2009), SE is future-orientated and takes into consideration economic prosperity, social justice and environmental protection. The common theme in the literature on SE includes these three dimensions and thus SE can be defined as the "*enduring entrepreneurial process that crafts organizational goals consistent with the taxonomy of central core values. Organizational goals refer to the creation, evaluation, and exploitation of opportunities that promote internal and external sustainable development gains inside the triple-bottom line of economic, social, environmental tributes*" (Tarnanidis & Papathanasiou, 2015 p 15).

Shane & Venkataraman (2000, p. 218) define entrepreneurship as "*the scholarly examination of how, by whom, and with what effects opportunities to create future goods and services are discovered, evaluated, and exploited.*" Thus SE can be defined the "*scholarly examination of how opportunities to bring into existence future goods and services are recognized, developed, and exploited by whom, and with what economic, social and ecological consequences*" (Binder & Belz, 2015, p1). Sustainable entrepreneurship differs from social entrepreneurship which tends to focus on social missions. Sustainable entrepreneurship creates products and services that create the economic value of traditional entrepreneurship and also focus on addressing social and environmental issues (Schaefer, Corner & Kearins, 2015; Binder & Belz, 2015). Traditional entrepreneurship focuses mainly on profit

(single bottom-line). Social entrepreneurship is concerned with economic and social goals (double bottom-line). Sustainable entrepreneurship centers on economic, social and environmental goals (triple bottom-line) (Thompson, Kiefer & York, 2011; Belz & Binder, 2015).

2.3 Sustainability orientation and sustainable entrepreneurial intention

Sustainability orientation (SO) refers to businesses that focus on sustainability. Kuckertz and Wagner (2010) relate SO to entrepreneurs as individuals rather than to businesses. At the individual level, SO is the business where the owner/manager has a proactive orientation towards societal and environmental issues (Diehl et al. 2015). SO is a business orientation that focuses a company's philosophy of doing business in a socially and environmentally sustainable way (Roxas & Coetzer, 2012). SO comprises of items that examine the underlying attitudes and personal traits on social responsibility and environmental protection (Sung & Park, 2018; Nordin, Iksan, Nusaibah & Salehudin 2018). Sustainable entrepreneurial intention (SEI) refers to an individual's willingness to become a sustainability-oriented entrepreneur. SEI is the intent to start a business that considers social and environmental issues (Kurkertz & Wagner, 2010; Sung & Park, 2018). The intention to start a venture is supported the TPB by Ajzen (1991). The TPB extends the Theory of Reasoned Action (Fishbein & Ajzen, 1980). The TPB postulates that the intention of an individual determines his or her actual behaviour. The fundamental assumption of the TPB is that human behaviour is planned and preceded by intention towards that behaviour. The TPB is a strong predictive model for explaining human behaviour (Armitage & Conner 2013; Yuzhanin & Fisher, 2016).

Claudy, Peterson & Pagell (2016) find that at the firm level, SO is a strategic resource that leads to competitive advantage and superior financial performance. The literature is inconclusive about the relationship between SO and SEI. Kuckertz & Wagner (2010) examine the relationship between SO and the entrepreneurial intention of engineering and business university student. The results indicate that engineering students with a stronger SO have higher levels of entrepreneurial intention. However, this effect disappears for business students. Salma. Kamal & Jameela (2017) find no association between SO and entrepreneurial intentions. Nordin et al. (2018) find a significant positive correlation between entrepreneurial thinking and SO. Sung and Park (2018) also in a study of university students reveal that there is a significant positive relationship between SO and opportunity recognition and SEI. The argument of this study is that individuals with SO will be better able aware and recognise sustainability opportunities and this can lead to the SEI. Consequently, it is hypothesised that there is a significant positive relationship between individuals' sustainability orientation and their sustainable entrepreneurial intention.

3. Research methodology

The study adopted the quantitative research design that involved the use of survey. Self-administered questionnaire method was used to collect data.The cross-sectional approach was used for data collection. Cross-sectional surveys are relational because they can scientifically investigate associations between two or more research constructs. The participants in the survey were final year undergraduate students of the Department of Business Management of two universities located in the Limpopo and Gauteng provinces of South Africa. The participants were conveniently sampled. Questionnaires were distributed after lecture with the help of the lecturers. The questionnaire was pretested with thirty students and this led to minor amendment to improve face and content validity. . For ethical consideration, the participants were informed about the aim of the study, participation was voluntary, and confidentiality and anonymity were assured. Reliability was measured using the Cronbach's alpha. The data analysis methods for the study were descriptive statistics, correlation and regression analysis. The variables in the study were measured as follows:

SO: Survey questions to measure SO were adapted from previous studies (Kurkertz & Wagner 2010; Sung & Park, 2018). The exploratory research on SO was by Kurkertz & Wagner (2010). The items used to measure SO

by Kurkertz & Wagner (2010) had a Cronbach's alpha of 0.64 and the authors add that for a new construct, an alpha value of 0.6 is deemed sufficient as suggested by Peterson (1994). Sung & Park (2018) had a Cronbach's alpha of 0.89. SO was measured at the individual level using the five-point Likert scale with "1 strongly disagree" and "5 strongly agree". The six questions used to measure SO were (1) firms should take an internationally leading role in the field of environmental protection. (2) corporate social responsibility should be part of the foundations of a firm (3) environmental problems are one of the biggest challenges facing our society (4) firms and entrepreneurs should take on a larger social responsibility (5) in the future, financial institutions will put great emphasis on firms' environmental performance (6) firms with an environmental orientation will have advantages in recruiting and retaining qualified employees. The average score of the six items was used to calculate the SO index.

SEI: Items to measure SEI were adapted from previous studies (Sung & Park, 2018) with Cronbach's alpha of 0.92 and Nordin et al. (2018) with Croonbach's alpha of 0.74 SEI was measured at the individual level using the five-point Likert scale with "1 strongly disagree" and "5 strongly agree". The four questions used to measure SEI were: (1) Becoming a sustainable entrepreneur is my professional goal (2) I am willing to do anything to become a sustainable entrepreneur (3) I feel enthusiastic to become a sustainable entrepreneur (4) becoming a sustainable entrepreneur is an interesting but challenging task.

4. Results and discussion

Three hundred and twenty questionnaires were distributed and three hundred and one questionnaires were returned and found usable. The response rate was 94%. The gender composition of the respondents was 54% female and 47% male. All the respondents were between 20 and 30 years. Independent samples T-test did not indicate any significant gender difference in the results.

4.1 SO of university students

Table 1. Descriptive statistics of SO

Measure	Mean	Standard deviation
Firms should take an internationally leading role in the field of environmental protection.	4.05	1.04
Corporate social responsibility should be part of the foundations of a firm	4.40	1.01
Environmental problems are one of the biggest challenges facing our society	4.55	1.01
In my opinion, firms and entrepreneurs should take on a larger social responsibility	4.10	0.97
In the future, financial institutions will put great emphasis on firms' environmental performance	3.90	1.03
Firms with an environmental orientation will have advantages in recruiting and retaining qualified employees.	4.05	0.00
SO index	4.18	1.04
Cronbach's alpha	0.84	

Source: data analysis

Table 1 depicts the SO index of the survey participants. The Cronbach's alpha is 0.84 which indicates the reliability of the measuring scale of SO. Nunnally (1978) points out that a Cronbach's alpha of 0.7 is viewed as the minimum acceptable level of reliability. The scale mean of SO is 4.18 which shows a high level of SO. On a five point Likert scale, a mean value below three is considered as low, three to four medium and above four high (Alarape, 2013; Neneh and van Zyl, 2017). The items with the highest means are environmental problems are one of the biggest challenges facing our society (4.55) and corporate social responsibility should be part of the foundations of a firm (4.40). This suggests that university students are concerned with both environmental and social issues. Today's young adults are more socially aware and environmentally conscious. University students

are the future generation of a society and have a passion for looking at different career options including social and sustainable entrepreneurship. (Kurkertz & Wagner, 2010; Ip et al. 2017). The high level of SO of university students is consistent with the findings of Sung & Park (2018).

4.2 SEI of university students

Table 2. Descriptive statistics of SEI

Measure	Mean	Standard deviation
Becoming a sustainable entrepreneur is my professional goal	3.32	0.98
I am willing to do anything to become a sustainable entrepreneur	3.40	1.03
I feel enthusiastic to become a sustainable entrepreneur	3.42	1.01
Becoming a sustainable entrepreneur is an interesting but challenging task.	3.50	1.06
SEI index	3.41	1.01
Cronbach's alpha	0.76	

Source: data analysis

Table 2 depicts the SEI of the survey participants. The Cronbach's alpha is 0.76 which indicates the reliability of the measuring scale of SEI. The scale mean of SEI is 3.41 which shows a moderate level of the intention of study participants to become a sustainability-oriented entrepreneurs. The findings are consistent with Nordin et al. (2018) and Sung and Park (2018) about the SEI of university students.

4.3 Correlation and regression results
The assumptions of correlation and regression include normality, homoscedasticity and absence of multicollinearity. Normality was assessed by examining the normal P-P plot. The data forms a straight line along the diagonal, thus normality can be assumed. To assess homoscedasticity, the researcher created a scatterplot of standardised residuals verses and standardized predicted values. The plot shows random scatter, thus assumption is met. Multicollinearity was assessed by calculated variance inflation factors (VIFs). VIF value is 4 which indicates that multicollinearity can be assumed.

Table 3. Regression results of SO and SEI

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std.Error	Beta		
Constant	103.048	3.099		1.309	.001
SEI	1.071	.0599	.611	11.114	.001
N=301, R= 0.681, R square .7649, Adjusted R square =.693, Sig.< 0.05					

Source: data analysis

The relationship between SO and SEI was analysed using Pearson correlation and regression analysis. The results of the correlation. The results (R =0.71, Sig.< 0.05) indicate a significant positive correlation between SO and SEI. The results of the regression analysis are depicted in table 3 (R square=0.693; Beta=0.611, Sig < 0.05) indicate a significant positive relationship between SO and SEI. The findings are consistent with previous empirical studies on SO and SEI of university students. Nordin et al. (2018) find a significant positive correlation between entrepreneurial thinking and SO. Sung & Park (2018) find a significant positive relationship between SO and SEI of university students. However, the findings of this study are inconsistent with the results of Kuckertz & Wagner (2010) which indicate that engineering students with a stronger SO have higher levels of entrepreneurial intention. However, this effect disappears for business students. In addition, Salma. Kamal & Jameela (2017) find no association between SO and entrepreneurial intentions. The Theory of Planned Behaviour (TPB) (Ajzen, 1991)

argues that intentions can be used to predict actual behaviour. The results suggest that university students will have a proactive orientation towards societal and environmental issues when they become business leaders.

5. Conclusion

SO refers to businesses that focus on sustainability. At the individual level, SO is the situation where the owner/manager of a business has a proactive orientation towards societal and environmental issues. SEI focuses on the intent to start a business that considers social and environmental issues. The aim of this study is to examine the effect of SO on SEI of university students. The intention to start a venture is supported the TPB by Ajzen (1991). The TPB postulates that the intention of an individual determines his or her actual behaviour. The fundamental assumption of the TPB is that human behaviour is planned and preceded by intention towards that behaviour. The TPB is a strong predictive model for explaining human behaviour. Today's young adults are more socially aware and environmentally and entrepreneurially conscious. The results indicate a significant positive relationship between SO and SEI. The findings are consistent with Nordin et al. (2018) and Sung and Park (2018). From an empirical perspective, the findings contribute to the literature on sustainable entrepreneurship, SO and SEI. The findings revealed that SO positively impacts on SEI of university students. To improve the SO of university students, the curriculum should include sustainable entrepreneurship at both undergraduate and graduate levels for all university students. The teaching of sustainability entrepreneurship must be passively and actively managed. Sustainable entrepreneurship experts in universities, institutes and business should be invited to provide both the theoretical and practical knowledge to students.Competition on entrepreneurship in universities should focus on sustainable entrepreneurship. Students should go for practical experiences in sustainable organisations. Universities should create endowed chairs on sustainability to improve the teaching and research on sustainable entrepreneurship. In addition, university management should develop a sustainability plan and be involved in sustainability actions. Sustainability policy statements of university should be communicated to all stakeholders including students. The performance of universities should reflect the sustainability balanced score card. Organisations that support small businesses in South Africa such as the Small Business Development Agency (SEDA) should include sustainable entrepreneurship in their strategic and operational plans. This can assist these organisations in designing training programmes on sustainable entrepreneurship for university students and small businesses.

The study has some limitations. First, the study used convenience sampling method and only 301 students from two universities participated in the study. Therefore, care should be exercised in generalising the findings of the study. Second, the study used the cross-sectional approach and cannot be used to analyse behaviour over a period to time. This limits the ability of the study to determine cause and effect. Because of the cross-sectional nature, the timing of the survey is not guaranteed to be representative. Other studies can explore the effect of SO on the entrepreneurial orientation of university students. A cross-country (developing and developed countries) study of SO and SEI of university students will help to generalise the findings of this study. In addition, a longitudinal study that will provide causal inferences into the relationship between SO and SEI can be explored.

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EXPLORATION OF BARRIERS FACED BY FEMALE GRADUATE ENTREPRENEURS IN BANGLADESH

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Abstract. This study explores and examines barriers faced by female graduate entrepreneurs founding and growing SMEs in Bangladesh. It particularly seeks to address the current gap in the literature on the barriers faced specifically by female graduate entrepreneurs in Bangladesh, and is among the first of its kind. We conducted 12 semi-structured interviews including 6 graduate female entrepreneurs of SMEs and 6 scholars in entrepreneurship in Dhaka, Bangladesh, and found that educated, graduate, females faced more barriers than uneducated or non-graduate females because of their educational background. It appears from our research that those women who had graduated from university were more likely to join in a company rather than starting and continuing to develop their own business. In addition to these key findings, we also found that Bangladeshi female graduate entrepreneurs had a lack of negotiation and pitching skills, little confidence, little access to institutional training and courses on SMEs and entrepreneurship. They also faced barriers such as lengthy, biased, and expensive loan facilities, corruption, operating in a conservative culture, a lack of support from their families and partners, barriers in mobility caused by traffic congestions in Dhaka, and risks to personal security. All of our findings from the interviews are well supported by additional research in the form of scientific observations of 79 entrepreneurs and 20 private and 5 public universities. The practical implications of these barriers are discussed in the paper and recommendations offered to key stakeholders to facilitate female graduate entrepreneurs in opening and operating SMEs in Bangladesh.

Keywords: female graduate entrepreneurs; barriers; SMEs; stakeholders; Bangladesh

1. Introduction

It is generally considered easier than ever for both males and females to start their own businesses in most countries across the world, but it is accepted that in the current environment the real barrier is for people is to in order to sustain and progress these businesses (Coleman, 2016; Burns, 2016; Cole, 2018). It is also accepted that educated people, regardless of their gender, have more potential to be successful entrepreneurs (Fenton, & Barry, 2011; Lipset, 2018). This can be attributed to a range of factors inhibiting less educated people including technological advancement, business set up processes, getting permission from respective government offices, and accessing loans from banks. In addition to these issues there is also evidence to suggest that educated people are also more aware of business opportunities in the market (Fenton, & Barry, 2011; Cesaroni and Sentuti 2016; Lipset, 2018). Entrepreneurs are currently considered as the main individuals who constitute modern global economic development (Kirschoff and Phillips, 1989; Keeble et al., 1990; Audretsch and Fritsch, 1991). They achieve this by generating ideas for new business ventures that utilise new or existing products or services, financial models, people, and/or equipment and facilities, contributing positively to the economy in the process (Donnely et al, 1990). Not only do many entrepreneurs aim to be profitable, but many also have a social conscience and create employment opportunities for different people regardless of gender, donation, or innovation, whilst simultaneously increasing competition in the market (Chell, 2013; Yunus, 2017; Hamdan, 2019). Thus, participation of females in the private and public companies established by different entrepreneurs has been increased in recent years throughout the world especially in developing countries such as those across South Asia (Kunze, & Miller, 2017; Baird, Ford, & Hill, 2017). For example, two decades ago women in Bangladesh made up only 10% of the labour force, whereas they currently comprise more than 40% of it (Byron and Rahman, 2015; Bangladesh Bank, 2017). The rise in the number of women in the country's labour force can largely be attributed to a 'private industry revolution' caused by the increased number of entrepreneurs establishing companies across industries and services in Bangladesh (Islam, 2009; Yunus, 2017). Despite this economic change and increased numbers of women in the labour force, the employment of the graduates in Bangladesh is very low in comparison with other countries in South Asia. For example in 2015 30% of graduates in India and Pakistan were unemployed, whereas in Bangladesh 50% of graduates were not in employment (Asadullah, 2015). This high level of unemployment has been identified as an issue in relation to sustainable development in Bangladesh and a solution is needed urgently if the country's economy is to continue to develop (Asadullah, 2015). According to Yunus, (2017), encouraging graduates to engage in entrepreneurship by establishing and operating small and medium enterprises (SMEs) can be an effective solution to the issue of graduate unemployment, creating a job for the entrepreneur along with additional jobs for other graduates. One outcome of this activity is the acceleration of economic growth. This approach could help to address the issues seen in Bangladesh with evidence from The Daily Star (2015) suggesting that there is the potential to do this, as there are already 79,754 SMEs with more than 6 million workers in Bangladesh. Furthermore, opening a SME with a small amount of capital is relatively easy in Bangladesh, which means this opportunity should be accessible to a number of people and could be implemented as a strategy to lessen the problem of high numbers of unemployed graduates in the country (SME Foundation Survey, 2006-07; MIDAS, 2009; Islam, 2009; Fatima and Ahmed, 2017). Accordingly, many male and female graduates have opened SMEs in different districts of Bangladesh but generally their performance is limited in terms of revenue earnings and organisational growth (SME Foundation Survey, 2006-07; MIDAS, 2009; Islam, 2009; Fatima and Ahmed, 2017). This reflects the more global problem identified earlier in the introduction, and has resulted in several studies examining the barriers faced by the SME entrepreneurs in Bangladesh to grow their business (SME Foundation Survey, 2006-07; MIDAS, 2009; Islam, 2009; Fatima and Ahmed, 2017). However, there is a distinct gap in the specific empirical research relating to barriers faced by female graduate SME entrepreneurs in terms of opening and operating SMEs in Bangladesh, because there are no previous studies that explore the barriers faced by this specific group of people. If we consider that females make up 49.4% of the population in Bangladesh, 4 % of the graduate population, and 50% of the body of unemployed graduates in the country then it is clear that this study to

specifically identify the barriers female graduate entrepreneurs face in opening, growing and sustaining SMEs in Bangladesh and to provide potential solutions to these issues is essential (Khatun, 2018). It is already known that female entrepreneurs run many SMEs in Bangladesh and contribute positively to the country's economy (Asadullah, 2015; Pramanik, 2018), however very few of these are female graduates (Sultana, 2018; Pramanik, 2018), and it has been argued that the growth and sustainability of their companies may be hindered by their lack of education (Chowdhury, 2007; MIDAS, 2009; Bakht and Basher, 2015). There is the potential, then, to grow Bangladesh's economy in a sustainable way by introducing more SMES founded and led by female graduate entrepreneurs, something that might be facilitated by better understanding and removing the barriers they face (Chowdhury, 2007; MIDAS, 2009; Bakht and Basher, 2015). This study aims to do this by exploring:

1) What are the barriers female graduates face when opening a SME in Bangladesh?
2) What are the barriers female graduates face when operating SMEs in Bangladesh?
3) How these barriers can be overcome in relation to female graduates in Bangladesh?

There have been many female graduates, who have started SMEs in Bangladesh, however, the barriers they face in opening and operating their business have not previously been empirically researched. Hence, female graduate entrepreneurs and academic experts were interviewed as part of this research project to provide detailed information relating to the main barriers that create barriers to opening and operating SMEs in Bangladesh.

2. Literature review

2.1 SMEs in Bangladesh

It is recognised that Bangladesh is one of the fastest developing countries in South Asia, and is heavily dependent on SMEs for economic development, job creation, and knowledge expansion (Abdin, 2014; Habib, 2015; ADB, 2016; Yunus, 2017). For example the Asian Development Bank Institute (2016) stated that 99% of formal Bangladeshi business enterprises are SMEs and it is a well cited fact that SMEs have created employment for around 75% of non-agricultural workers in Bangladesh (ADB; 2016; Bangladesh Bank, 2017; Abdin, 2017). In addition to the impact on employment levels SMEs contribute more than 25% to the national GDP of Bangladesh (ADB; 2016; Bangladesh Bank, 2017; Abdin, 2017). The Bangladesh Bureau of Statistics (2016) showed the contribution of SMEs to the country's GDP was 30.42% in 2014-15 and it increased to 31.54% in 2015-16. To boost the sector the Bangladeshi Government and its central bank have actioned integrated initiatives to promote SMEs and have tried to instigate improved levels of success lacking in the SME sector (Bangladesh Bank, 2019).

As this study concentrates on the barriers faced by female graduate SME owners specifically in Bangladesh, the tabular definitions of SMEs have been adopted from the Bangladeshi National Standard (see below Table 1) (Bangladesh National Industrial Policy, 2016). However, it is recognised that SMEs are defined differently in terms of capital and employment in the European Union (EU) and other countries. For example the standard EU definition states that an SME comprises fewer than 250 employees with less than €50 million turnover (EU, 2016), while in India a SME is defined as an organisation that has Rs. 25 lakhs ($^≈$US $ 0.04 million) to Rs. 10 crores ($^≈$US$1.6 million) turnover (SME Chambers of India, 2019). In Australia and New Zealand SMEs are defined as being organisations with up to 200 full-time equivalent employees (Dcmsme.gov, 2019). It is clear that there is no uniform worldwide definition of SMEs (Megginson et al, 2003; Omor and Ismail, 2009), because each country or region use their own measurement according to their level of development (Bilal and Mqbali, 2015). This disparity and specificity to a country's economic development status means that there is no value in challenging the localised definition of a SME or in trying to apply another country's definition to those in Bangladesh. In fact, it is crucial to work within Bangladesh's framework to ensure that this research can have a practical impact.

Table 1. Definitions of SMEs in Bangladesh

Sector	Replacement Cost (BDT=Bangladeshi Taka)	Employed Manpower (not above)
Service	50,000-50,00,000	25
Business	50,000-50,00,000	25
Industry	50,000-1,50,00,000	50

Note: USD 1= BDT 82
Source: Bangladesh Bank (2017)

2.2 Major barriers faced by entrepreneurs in Bangladesh

Whilst there are differences in terms of defining what an SME is in relation to its size and labour force, it appears from the literature that the barriers SMEs face relating to setting up and growth are similar globally. Kuratko and Hodgets (1995) established that the key barriers for SMEs are opportunity orientation; tolerance of failure; human relations skills; initiative and responsibility; integrity and reliability; internal locus of control; technical competence; high achievement drive; and mental ability. Existing literature suggests that these barriers have not changed in the last 23 years and are represented worldwide in studies from the 1990s onwards. For example Foon and Eu-Gene, (2006); Saleh and Ndubisi, (2006); Bardasi and Guzman, (2007); MIDAS; (2009) Bilal and Mqbali, (2015); Chowdhury, et al, (2015), all identified these problems in their studies. However, new barriers have also emerged from their studies that include political constraints, lack of infrastructure, corruption, low productivity, laws and regulations, and a lack of clear guidance and policy for the development of the sector. On the other hand, it has been widely acknowledged in these studies that opening a SME in different countries is easier and less expensive than a private limited company or partnership venture. Therefore it can be surmised from the literature that the barriers SME entrepreneurs face in Bangladesh, regardless of gender, are similar to other countries globally.

A key difference in experience between Bangladesh and other countries is that females in Bangladesh face more difficulties in running their SMEs in comparison with men (Bardesi and Guzman, 2007; MIDAS, 2009; Alaudin and Chaowdhury, 2015). Difficult and lengthy access to finance, poor infrastructures, high costs and lack of marketing facilities are the most significant barriers for the SMEs in the Bangladesh (Shakantu et al, 2007; Bahkt and Basher, 2015; Fatima and Ahmed, 2017). Bahkt and Basher (2015) and Ghosh, et al, (2017) identified SMEs owned or managed by women are discriminated against by institutional finance bodies, and poor social acceptability of females as business owners is also another hindrance for the development of female-owned SMEs in Bangladesh. However, it has been established that in developing economies like Bangladesh SMEs can be an alternative driving force for economic growth and should be supported (Hasan and Jamali, 2014; Chowdhury, et al, 2015, Fatima and Ahmed, 2017). In this regard, educated people particularly graduates i.e. males or females can be vital part of the growth establishing SMEs rather than working for a corporation or another business owner if they are given necessary support to manage the barriers we have identified in our research (Chowdhury, 2007; MIDAS, 2009; Bakht and Basher, 2015). According to the literature, significant studies have been done to recognise and highlight the barriers faced by entrepreneurs in Bangladesh and other countries. However, it is not clear from these studies what particular factors create barriers for numerous Bangladeshi female graduates when opening and operating a SME. Therefore, this study aims to identify those barriers so that the Government of Bangladesh and other development partnering countries and organizations can take action to encourage more female graduates to set up their own SMEs.

3. Methodology

The empirical basis for this study is structured from qualitative research carried in the research context described above. A convenience sampling method was used to select the participants because it offered the flexibility to reach a number of participants. The location for data collection and observation i.e. Dhaka was selected because of convenient access to participants and time and budget limitations (Yin, 2009), which was considered appropriate for an exploratory research project. Over 3 months, 6 female entrepreneurs and 6 scholars were interviewed with semi structured questions and the researchers observed 79 entrepreneurs, 20 private, and 5 public universities (Rahman, Billah and Hack- Polay, 2019). Hence, the paper critically examines results extracted from the interviews and observations. All participants were Bangladeshi citizens living in Dhaka from different districts of the country. The graduate female entrepreneur participants were selected based on the educational qualification and duration their SMEs had been in operation. The baseline qualification for the study was an undergraduate degree, with 3 (or 50%) of the participants holding a bachelors degree, and the remaining 50% of the participants Masters' degree holders. The scholars who participated in the study were university lecturers and professors with expertise in SMEs and entrepreneurship. The names of the participants have been changed in the paper to protect their identities. All interviews were recorded in English therefore translation was not required. As this research utilised a small sample of interviewees, the primary data were anyalsed manually and we concentrated on identifiying themes that arose from the interviews. We did this by reviewing the transcripts and coding the themes, which allowed us to group the themes together for analysis and discussion.

4. Research findings and analysis

This section includes the presentation and analysis of the primary data gathered during the research. It addresses not only emerging themes linked to the barriers female entrepreneurs in Bangladesh face in setting up and operating SMEs, but also how they have overcome these barriers. This key information informs our recommendations on practical initiatives that can be taken to facilitate SME creation and support its operation.

4.1 Barriers in opening SMEs

Economic Barriers
All the respondents of the study outlined interesting points regarding economic barriers in opening SMEs. Most of them confirmed, in line with existing literature, that there are few economic barriers in opening a SME in Dhaka, Bangladesh, because little start-up capital is required. For example, if anyone has only 50000 taka in Bangladesh they can start a business and it will be classified as an SME. All of the participants outlined that after graduation collecting the few thousand taka was not a barrier for them, therefore, starting a small business is relatively easy in this respect. This finding is consistent with previous research results published by the SME Foundation Survey, (2006-07); MIDAS, (2009); Islam, (2009); Fatima and Ahmed, (2017).

Cultural Barriers
The strongest barriers the female graduate entrepreneurs interviewed for this research faced in starting a business in Bangladesh were cultural. This is much in line with the main barrier faced by females in starting a business in South Asian Countries highlighted in the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) report (2013) and Organisation for Economic Co-operation and Development (OECD) report (2017). The first cultural issue noted by all 6 participants was the female manager or owner being out of place in the business environment, Participant 6 summed this experience up well when she said,

> "*Women potential as successful business magnet is not taken in our society positively since most of the people like us to be at home rearing children and doing households works*".

This is consistent with the research results of the studies by Rahmatullah and Zaman (2014), Islam and Jantan, (2017) and Masuda and Chowdhury, (2017) who have also found that particular societies do not respond positively to female success in business and would prefer females to be at home undertaking household duties. Further to the idea that the women were operating outside their traditional societal roles, all of the female graduate entrepreneur interviewees perceived the societal norm of early marriage as a key barrier to overcome and open a SME in Bangladesh, for Example Participant 4, said,

> "*In our culture most of the females, either educated or not, assumed to be married as soon as they in suitable age and after their marriage they are rarely inspired to open a business that creates the most difficult and negative barrier for a women to open a SME in the different industry in spite of her interest and potentiality*".

This finding is also consistent with previous studies such as Chowdhury et al, (2015), Islam and Jantan, (2017) and OECD, (2017) who all found that it is a societal preference in South Asia and Bangladesh for women to be married at a young age and assume a traditional domestic role.

Social Barriers

Whilst the female entrepreneur participants highlighted cultural issues, practical barriers in setting up a SME particularly linked to the cultural context were elicited from the scholars' responses during the interviews. In this regard, Participant 8 opined that

> "*The lack of negotiation and pitch skill is one of the key barrier that needs to be removed from the students to make them successful entrepreneurs and in terms of female graduates this is more common since Bangladeshi society is a conservative cultural society where girls are not allowed to speak up in most cases even though they are educated*".

In addition, Participant 10 added that

> "*An entrepreneur not only has to develop a business and starting business but also pitch this to different panel for example to the banks to take loans, to the government administrative officers to get government benefits and so on. In this regard, without the entrepreneurship and business related courses, students get very few ideas about the business venture therefore they face barrier to start a SME or any other kind of business organization*".

The rest of the scholars who participated in the research raised similar concerns regarding the lack of negotiation and pitching skills and the barriers this creates for graduate female entrepreneurs who endeavour to open and operate their SMEs in Bangladesh. For example, they emphasized the need to convince both male and female students to develop these skills through different processes. Their emphasis on the process of developing negotiation and pitching skills mirror the researches by Clark (2008), Eddleston et al, (2006), Chell, (2013), Chang and Rieple, (2013) and Mamabolo et al, (2017).

The observations by the researchers mirrored the social barriers for female graduates setting up SMEs that were recognised by participants in interviews. However, our observations highlighted that there very few universities in Bangladesh that organise business start-up workshops for students and there is a general lack of support available to graduates who want to open their own business. Conversely, most universities do organise job fairs for their recent graduates attracting many local and international private and public companies that inspire the graduates to join in a company rather than starting their own SME. Based on this observation all the scholars and the

entrepreneurs were asked if establishing start-up workshops or seminars and support by universities would be helpful or not for students, regardless of their gender. All of them answered that if universities offered these types of activities they would be able to inspire female students to start a SME rather than going to work for an established company after their graduation.

Political Barriers

A lack of Government administrative support for encouraging the set-up of SMEs for graduate females was recognised by all 6 entrepreneurs. This was exemplified by Participant 3 who said that

> "*The government and non-government supporting news in newspapers and the public programs held in our area inspired me to be an entrepreneur, however, my practical knowledge about their helps in opening and operating the Corner Shop is very dippersful specially in taking loans from government owned banks and high interest of NGOs and Co-Operative loans along with lengthy process*".

Similar opinions were provided by other 3 participants such as Participant 2, Participant 1, and Participant 5 interviewed in this study. However, Participant 5 specifically added that

> "*Government officials support only to the persons, who supported the ruling government parties during the election! As a result, the business women like us, who are not involved in politics directly, never get support from the government officials and representatives*".

This is consistent with Islam, (2009), Bakht and Basher, (2015) Chowdhury et al, (2015) who also identified that there is a lack of government support and motivation for female graduates to be entrepreneurial.

4.2 Barriers in operating the SMEs

Economic Barriers

Whilst no economic barriers were identified in the setting up of a SME, all 12 of the participants identified financial constraints as the most significant barrier for graduate female entrepreneurs when operating their businesses. Participant 3 mentioned that

> "*Studying in Bangladesh particularly in private universities is very expensive that is financed by parents in most cases. After the graduation of students, most of the parents want their graduate children to earn money immediately to hold the financial responsibility of the family or return the money that has been spent for study. Therefore, after graduation opening a SME or any other organisation is tough, however, it is sometimes overcome but operating the organisation for long time becomes difficult and challenging. For example, I do not get any financial support for my SME from family and even to get loan from public bank is lengthy and bias while the getting loan is easier from NGOs or other financial organizations but very expensive due to high interest rate*".

This is similar to previous results of research conducted by Bahkt and Basher (2015) and Ghosh, et al, (2017) who found a general lack of support for women from the financial organizations. For example, they identified that bank managers are not very comfortable in lending money to female entrepreneurs. This is also consistent with other previous studies for example Cesaroni and Sentuti (2016) found that in the context of Italy, a person's gender impacts on banks' decision making around lending for the purposes of operating a business. However, our result contrasts with a report that the Bangladesh government (published by Bangladesh Bank, 2019) equally distributes loans and other economic support to both male and females. Therefore, our results urge the

government to monitor the current situation of loan disbursement and other economic support for female entrepreneurs.

Cultural Barriers

Cultural barriers for female graduate entrepreneurs are similar in operating SMEs to those faced when establishing a business, something that was commented on by all the participants. Participant 6 outlined how societal and family expectations create obstacles in operating SMEs. She said

> *"In our society even in urban areas where most educated people live expect females regardless of their degrees or qualification, skills or passion to continue business, should remain at home people to perform family responsibilities such as rearing children, preparing foods and so on. As a result, due to lack of cooperation comes from the society as well as family members.*

Furthermore, Participant 4 added

> *"Although a graduate female overcomes the barriers in opening the SMEs or any business but after her marriage, family responsibilities and lack of cooperation from husband and other members of family do not allow to continue the business. As a result, a dream dies very silently and it has been common in many cases. For example, I had two friends, who started small business of selling jute products and beauty salon but they closed businesses due to lack of family cooperation and inspiration.*

The insights derived from Participant 4 and Participant 6 were similar to other respondents and these are also consistent with previous studies such as Islam and Jantan, (2017) and Masuda and Chowdhury, (2017) who outlined that females are not supported by their families and Bangladeshi society when trying to run a business. Furthermore, Chowdhury et al, (2015) and OECD, (2017) have reported similar findings in relation to cultural barriers in operating a SME in Bangladesh. However, with the advancement of the technologies and literacy rate in Bangladesh there is the potential for societal norms to be barrierd and these barriers to be reduced, but this has not been done by government officials and is a cause for concern. A further cultural barrier is one of security for women. Participant 7 agreed with the view of Participant 2 in case of security issue and quoted that "*moving in Dhaka City alone with a handbag is very dangerous especially in evening and morning times*". Both of them added that this security situation for women has a negative impact on the business operations.

Social Barriers

Participant 5 and Participant 3 and Participant 9 were concerned regarding the social issues specially the costs of traffic jam and risky transportation in the social environment where they run SMEs. However, Participant 9 said that

> "*Traffic jam and risky transportation with high expensive tickets are also most of the barrier that should be removed from the country to create easy market environment for the entrepreneurs especially for the graduate female entrepreneurs*".

Participant 8 added that

> "*There are also some over-highlighting job advertisements in different mediums, however, opportunities for graduate to join there is very limited. But these allure graduates particularly female graduates to apply for job and wait for the result that takes a long time. As a result, the graduate loss interest to start a business rather than continuing applying in the different organizations to get a job*".

In contrast, Participant 5 outlined

> "*Not getting job was the motivation for me to start a business but my friends, who joined in the banks rather than starting a business, are in good position with good income therefore it attracts me to close down my SME since competition and political uncertainty is increasing day by day*".

This view is supported from the response of Participant 10 that

> "*Joining and being permanent in a job especially in a multinational company or public organization gives financial security for a graduate along with a secure future with a lump sum amount of pension in the bank. Therefore, some students after their graduation start business but when they find huge difficulties and challenging due to political turmoil, mismanagement of government offices, lack of family supports, market competition etc. they tend to leave the business and try to join in a company. There are substantial opportunities for experienced people with business knowledge therefore the graduates become interest to join in the company in most cases due to the barriers they face in operating their SMEs*".

All the social barriers derived from the participants in this section are in contrast to previous studies where job availability and secure future for a job holder, traffic jam, and risky transportation have not been highlighted as a social barrier. Therefore, this study has been a significant contribution for the respective decision makers for example government in Bangladesh to motivate or facilitate women to start a business rather than joining in a job.

Political Barriers

Political uncertainty, strikes by political and even non-political organisations, and autocratic attitudes have been identified as the political barriers faced by SMEs' owners in operating. It is reflected from the response from Participant 5, who said

> "*Government uncertainty, ruling party's pressure on opposition, students politics, strikes have been regular in Bangladesh, thus, these create obstacles to keep their business open regularly*".

Similarly, all the participants provided similar data regarding the political barriers in operating SMEs in Bangladesh. This result is consistent with previous studies, for example Chowdhury, et al, (2015) and Alauddin, M. D., & Chowdhury, M. M. (2015) and Hasan & Jamil, (2014). It is likely that this similarity is because Bangladesh has had the same ruling party for over a decade, but there is the potential for lobbying to ask them to take a new stance on supporting female graduate entrepreneurs.

4.3 Overcoming the barriers

The participants suggested areas that could be addressed to overcome the barriers in opening and operating SMEs by female graduates in Bangladesh. Bangladesh has experienced tremendous improvement in the digitalisation of the different aspects of society including public organizations (UN, 2017; FT, 2017). However, there is no online registration for SMEs and no data on entrepreneurs/owners of SMEs shared digitally by the government department responsible for SMEs. The scholars in this study suggested that the government need to utilise digital resources to create an online registration process for SMEs, noting that this approach could remove biasness, and reduce the lengthy and expensive process of opening and operating these economic enterprises. This view was also held by female graduate entrepreneurs who participated in the study. Participant 3 said that

"*Digitalisation of SMEs registration will contribute to get loans and other supports from the banks and other financial sources without running to submit papers and details most frequently in different offices because respective offices, required for information to take decision on SMEs and their owners, can get the data in the SME portal*".

All of the participants placed an emphasis on the importance of a need for training and seminars on entrepreneurship and different business opportunities in Bangladeshi universities and colleges. Participant 11 said that

"*Most of the universities and colleges organise job fair adjunct with different private companies to attract the talented students to join in the different vacant positions. However, it is rare that the universities and colleges have organised business opportunity fairs for the graduates. Therefore, regular business opportunity fair could be very effective to stimulate graduates specially females to start a SME rather than looking for job. This will also be effective platform to identify the barriers, which could be faced in opening and operating a business while possible solutions could be clarified. As a result, the existing and potential entrepreneurs would be start and continue their business specially in SME sector of the Bangladesh*".

Participant 9 said that

"*At present there are only entrepreneurship course and trainings under the business and management faculties in the universities but students from other faculties also pose potentiality to be a successful entrepreneurs. However, there are very few training programs and courses relating to entrepreneurship in those faculties therefore the students are not inspired to open a small and medium enterprise (SME). Hence, organising those programs would be effective to motivate graduates from science, law, and other faculties to start a business especially in SME sector since it is easier than other sectors*".

All of the 6 female graduate entrepreneurs and scholars that participated in the study highlighted the importance of the need for changes in attitudes towards female entreprenurship in terms of both among individuals and society. This is perhaps one of the most significant barriers to women wanting to open and operate SMEs in Bangladesh today. Participant 5 added that

Husbands and parents should be supportive to female counterparts so that they can use their talent for themselves rather than working for others to give better outcome for family and society and finally the country".

According to the results highlighted in this section regarding overcoming the barriers barriers in opening and operating SMEs, the following suggestions can be outlined for the attention of respective authorities (in particular the Bangladeshi Government) :
1) Digitalisation of registering SMEs and loan disbursement for SME entrepreneurs.
2) Organising training and seminars on business opening and operating processes.
3) Short courses for all students on entrepreneurship in the universities.
4) Attiudinal changes in society towards female entrepreneurship.
5) Organising business opportunity workshops in universities for the fresh graduates or the students from different faculties including business, law, tourism, science, medical etc.

5. Key themes emerging

In summary, the 6 graduate female entrepreneurs and 6 scholars interviewed offered a range of answers to the questions of the study. They simultaneously identified a number of the barriers in opening a SME in Bangladesh, with their responses cooberating one another. These barriers include gender stereotyping, lengthy registration process, bias and ambiguous government administrative system, lack of support from their families and/or partner, complicated start-up capital support from the banks and other financial institutions, and a lack of negotiations and pitching skills.

Barriers stemming from the operational processes of SMEs in Bangladesh include lack of loans to finance when needed, lack of security, bias and lengthy process of getting financial supports, traffic jam, risky and expensive transportation, job opportunities for experienced people with qualification, and the competitive market environment.

Though not explicitly stated, the theme running through many of the interviewees' responses was that there are a number of reasons, which create difficulties and barriers in both opening and starting a SME in Bangladesh. The entrepreneurs and scholars participated in the study felt that they should not accept this situation because it needs to be changed and removed to facilitate the opening and operating SMEs by the talented people, especially by female graduate entrepreneurs.

6. Concluding Remarks

This study aimed to identify the barriers faced by graduate female employees in opening and operating SMEs in Bangladesh so that respective stakeholders such as government, policy makers and others can take action to overcome the barriers in the country. The barriers hindering the graduate female entrepreneurs and others to open a SME or other business came out of this study are:

- Gender stereotyping lengthy registration process.
- Bias and ambiguous government administrative system.
- Lack of partner and parents' supports.
- Lack of start-up capital,
- Rare and complicated start-up capital support from the banks and other financial institutions.
- Lack of negotiations and pitching skills.

The barriers creating obstacles in operating the established SMEs in Bangladesh are:
- Lack of capital for SMEs.
- Lack of security.
- Congestion.
- Expensive transportation.
- Government mismanagement.
- Opportunities for jobs for graduate and experienced entrepreneurs since they possess practical experience from being an SME owner.
- Market competition.

The suggestions made by the participants to overcome the barriers in case of opening SMEs included digitalisation of SMEs registering, loan disbursement, finding supportive partners for encouragement, and individual changes. In the case of operating SMEs founded in Bangladesh the suggestions derived from interviewees included facilitating loan disbursement for entrepreneurs, creating supporting environment in government offices, improving security, developing transpiration and reducing the fare of transports as well

traffic jam in Dhaka city where it is regular and most difficult phenomenon for city dwellers as well. Finally, graduate female entrepreneurs should barrier the paradigm of overall challenging circumstances to be successful although this is not without risk to personal and professional posture.

7. Practical implications

The government of Bangladesh needs to take more realistic initiatives to reduce and eradicate the barriers that are faced by the graduate female entrepreneurs in opening and operating SMEs in Bangladesh. There is great potential for female created and managed SMEs to operate successfully and contribute to the GDP, but this is currently limited because of the issues raised in this paper. This research shows that most of the students have the potential to be successful entrepreneurs in different sectors. However, it is identified that government systems, sophisticated, expensive and unfair financial sources, logistical issues, and a lack of family support are key obstacles in both opening and starting the SMEs in the country. A key question then is what can different stakeholders such as government, bank authorities, NGOs, and also to the entrepreneurs can do about these? An online discussion between 3 of the academic participants and 4 of the female graduate entrepreneurs, that followed the interview process, came up with a number of factors that should be considered by these authorities to facilitate the SME opening and operating processes:

- Improve the digitalisation for easy registering and entrepreneurs' information collection and sharing with different co-authorities such as banks. In this regard, online a secure form and entrepreneurs' profile could be effective,
- Offer easily accessible loans for entrepreneurs according to their business plans and reduce the interest of loans for graduate female entrepreneurs,
- The Government should monitor loan disbursement to make sure the right candidate receives it rather than depending on inaccurate information on the loan distribution among the different SMEs owners and others,
- Every university and college can organise entrepreneurship courses and trainings to provide practical knowledge to the graduates and potential graduates on how to open SMEs and operate them efficiently,
- Family members such as parents, husbands and others of graduate female entrepreneurs and potential graduate entrepreneurs should be convinced regarding the significance of female entrepreneurship for the individual and social benefits that would stimulate those people to be supportive to the graduate female entrepreneurs. In this regard, the government can take initiatives for example seminar on this context in different areas of Bangladesh to make people aware and motivated to express positive attitude and become co-operative.
- Graduate female entrepreneurs should have energy to sustain in the challenging contexts to be successful with their SMEs.

8. Limitations and Future Directions

Like most studies, the present study does have some limitations, particularly regarding the nature data collection and the size of the sample. During the data collection, the interviewer's personal attributes such as gender, age, profession and experience, could have influenced the participants' behaviour and responses. The nature of this study means participants might have been hesitant to discuss sensitive issues regarding barriers that are faced by graduate female entrepreneurs for fear of jeopardising their own careers. However, the confidentiality of participants was ensured to help counter this. The study included only 12 interviews, therefore, the outcome of the research cannot be generalized, but in future, the identified barriers can be applied in the survey to make the results generalizable. Moreover, a further, more in depth, study could be conducted among different ethnic groups of female graduate entrepreneurs to identify the barriers they face in opening and operating business. Furthermore, the results could be compared with, or tested in, other country contexts where the female entrepreneurship has been increasing with great potential.

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MECHANISM OF AN IMPROVEMENT OF BUSINESS PROCESSES MANAGEMENT SYSTEM FOR FOOD PRODUCTION: CASE OF MEAT PRODUCTS ENTERPRISE[*]

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Abstract. On the basis of the conducted researches it is revealed that introduction of process approach at the studied enterprise is caused by a number of features without which creation of the process focused control system is impossible. From the most significant features are distinguished such, as a set of technological, production, operating and providing processes; high complexity of processes; production continuity; huge number of standard and technical documentation; duration of processes in time; specificity of the capital equipment. The analysis of the quality management system at the Becker & K LLP enterprise is carried out; QMS business processes on IDEF0 methodology are developed. On the example of business process "To realize product release" actions for improvement of the mechanism of the business processes management system at the Becker & K LLP are developed. Process of production and storage of products is considered and on its example the technique of assessment of the process approach effectiveness for the enterprise is offered. The process model of management, and also action for improvement of activity of the enterprise is developed.

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1. Introduction

A serious competitive struggle caused development of quality improvement programs in the countries with the developed market economy. Worldwide, the relationship between large firms and their suppliers are long since based on quality management systems. For the consumer the quality system of the enterprise is a products quality assurance. The company's success in a market economy is based on high level of production organization, the core of which is a clear awareness and realization of each employee's responsibility and his role in achieving the company quality outcomes.

To the Quality Management System (QMS) corresponds the concept of general quality management since this system integrates organizational and functional structures of the quality management to operate business processes at each organizational level (Ponomarev S.V., Mironov S.V., 2007; Rodionova Yu.A., 2013). Application of the system significantly reduces the total number of required documents – various standards, orders, instructions, etc.

Business process (process) is a cumulative sequence of actions for transformation of the resources received at the input into the final product at the output that has a value to a customer (Standard of enterprise 7.2-02-2008; ST RK ISO 9001-2016; Repin V.V., Eliferov V.G., 2013).

Regarding to such a definition, it becomes clear that business processes exist at each organization, either formalized or not. Functional approach to management which considers the company as a set of divisions can be admitted to the organizations, each of which executes certain functions. In this case, each division is focused towards achieving its own goals rather than goals of the company, which, in some cases can negatively affect the general effectiveness of business (ST RK ISO 9001-2016; ST RK ISO 9004-2010; ST RK ISO 19011-2013; Gorshkov D.O., Kornilov D.A., 2015).

Technology of the description of business process does all operations of the company transparent and clear, allows to analyze operations and to find issues that cause failures. Existence of the developed system of business processes considerably simplifies matching company's activities with the requirements of ISO 9001 quality standards. Implementation of QMS at the enterprise without fail necessarily requires the creation and description of business processes.

This means that the issue of introducing the QMS and developing the business processes of the company QC is particularly relevant to date. The relevance of the topic is also defined by the fact that ensuring the competitiveness of any enterprise in the conditions of market economy is impossible without continuous improvement of its activity directed to improvement of quality of products. Quality assurance is a complex problem which has to be solved throughout the enterprise (Goldratt E.M., Cox J., 2009; Raver E.N., 2009; Shragenheim, E. 2014; Sobolkova A.V., 2008).

The purpose of this work was justification the feasibility of implementation process management at the selected enterprise and development recommendations and mechanism for optimizing core business processes as ways to improve the management system at the enterprise under study, as well as reviewing and developing business processes of the quality management system at the enterprise Becker & K LLP.

An object of the researches is activity of the enterprise in the form of the limited liability company "Becker & K" in its interaction with other economic entities.

A subject of the research is the quality management system and the process of the enterprise quality management focused on improving competitiveness of the enterprise, as well as the main business processes of Becker & K LLP.

As part of a systematic approach, methods of comparative, subject-object, functional-structural analysis and theoretical modeling were used in this paper. The theoretical and methodological background of the research became the concepts and hypotheses justified and presented in the modern scientific literature. The empirical base of the research are the analytical data published in scientific literature and periodicals, expert developments and assessments of Kazakhstan and foreign scientists, as well as materials on QMS of Becker & K LLP.

2. Literature review

A number of researches of scientists from different countries have been devoted to issues of quality management and the development of business processes; considerable experience has been accumulated in the field of quality management. The scientific interest in the quality problem induces the analysis of accumulated theoretical material.

A great contribution to the development of currently used quality management systems was made by Russian scientists A.M. Dlin, V.S. Mkhitaryan, V.I. Siskov, as well as foreign scientists B.Bergman, L.Knowler, A.Feigenbaum. However, according to the authors, insufficient attention was paid to the problems of implementing quality systems at enterprises, and ways to adapt them.

A number of tools are used for modeling, analysis and evaluation of business processes, covering all stages of creating quality systems. The success of a project to create, maintain and develop a quality management system at the enterprise largely depends on the choice of certain tools. Graphical representation is the most acceptable way to describe the processes (Standard of enterprise 7.2-02-2008; Aksenova O. P., Aksenov K. A., Antonova S. A., Smoliy E. F., 2013).

Such integrated tools include the functional modeling methodology IDEF0, designed for enterprise design and management, modeling, documentation, analysis and evaluation of business processes, development and implementation of an information system.

The IDEF0 methodology is based on the approach developed by Douglas T. Ross in the early 70s and called SADT (structural analysis and design technology).

2.1 Process approach. Processes classification

"A process is a set of interconnected and interacting operations (actions) that transform inputs into outputs to add value" (Standard of enterprise 7.2-02-2008; ST RK ISO 9000:2016). The added value of the process is manifested in the increased effectiveness and efficiency of the organization as a result of deliberate changes in the process.

A business process is a set of processes and interactions between them, the result (output) of which is product and/or service delivered to consumers, while inputs are material, information and labor resources supplied by external suppliers.

The main idea of the process approach can be reduced to the following theses (Kondrikov V.A., Plotnikov N.V., 2006; Bettina, Warzecha, 2017):
1) The activities of the organization must be presented in the form of a network of interacting processes;
2) Management of the organization activity should be based on managing a network of processes in order to increase their efficiency.

The structure of the management system, including quality management, built on the basis of the process approach, consists of two levels: management within each business process, as well as management of a group of business processes at the enterprise level.

Description of the network of processes of organization's activities is a complex organizational and technical task. Processes can be classified according to various criteria (Standard of enterprise 4.2.3.-05, 2005; Gorshkov D.O., Kornilov D.A., 2015):

Main (key) - processes, the immediate result of which is the release of products or the provision of services. Key processes have the greatest impact on achieving the organization's main goals;
Auxiliary (providing) - processes, the result of which is the creation of the necessary conditions for the implementation of the main processes;
Processes of management, the result of which is to increase the effectiveness and efficiency of the main and supporting processes;
Critical processes - represent an actual or potential danger to ensure product quality and, consequently, to business efficiency;
Management processes – processes which are owned by higher management (Raver E.N., 2009).

The implementation of process management is carried out in several stages.
- Process Inputs - input objects (raw materials, products, equipment, information or service) that are converted to Process Outputs during the execution of the Process. Often the inputs of one process are the outputs of another;
- Process Outcomes - products, information or services creation of which is the aim of the Process.
- The Network of Organization Processes - the integration of interconnected and mutually agreed Organization Processes into a single system (Gorshkov D.O., Kornilov D.A., 2015; Oschman, J.J. 2017).

Each process during decomposition can be divided into a number of subprocesses (business processes, works), the implementation of which leads to the creation of products with the specified parameters at the Process Output. Processes are chosen depending on the characteristics of a particular organization.

To improve the manageability of the Process, it is advisable to break it into a network of business processes. The number of business processes should also obey the 7 ± 2 law (the number of main processes) (Gorshkov D.O., Kornilov D.A., 2015). For the implementation of each business process, a responsible person from the department should also be appointed. An example of such a partition is shown in Fig. 1.
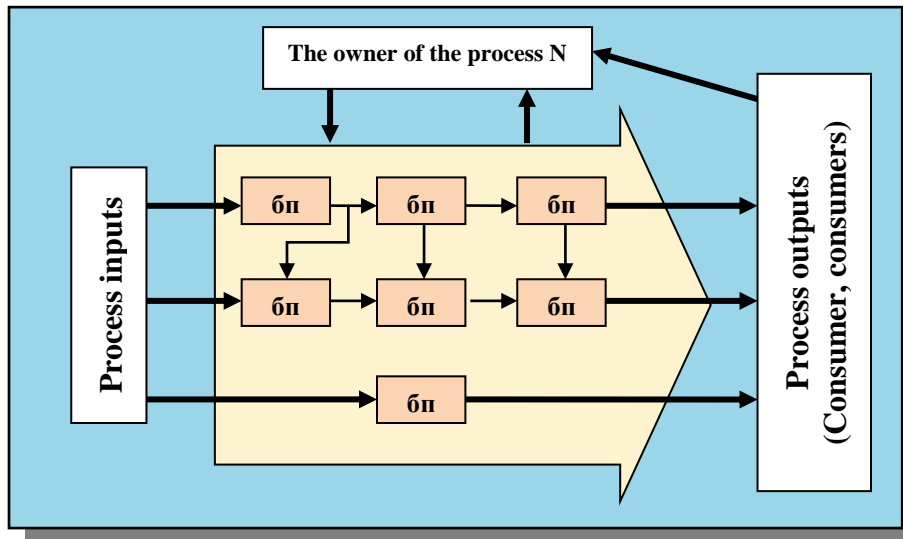
Figure 1. Decomposition of Process into the network of business processes

2.2 Principles of business process modeling according to IDEF0 standard

A number of tools are used for modeling, analysis and evaluation of business processes, covering all stages of management systems development. The most acceptable way to describe processes is graphical representation. Such integrated tools include the ARIS Toolset methodology, designed for enterprise design and management, modeling, documentation, analysis and evaluation of business processes, development, implementation of an information system (Bettina, Warzecha, 2017; Ogvozdin V.Yu., 2009). The ARIS Toolset toolkit contains over 80 models and methods for describing a business process. In the 70s, when implementing projects on the orders of the US Air Force, a program of integrated computer support for production (ICAM - Integrated Computer-Aided Manufacturing), and IDEF functional modeling methodology were developed. The methodology contains 11 standards from IDEF0 to IDEF11 (Shragenheim, E., 2014; Kuryan A.G., Serenkov P.S., 2001; P50.028-2001, 2000). The IDEF0 methodology is supported by computer programs. The use of computer programs at the stage of the process description allows not only to increase the efficiency of solving this problem, but also to use these models at the stage of process management, integrating them into the corporate information system of the organization. The functional model IDEF0 consists of two types of elements - functional blocks and arcs.

Each block in the framework of a single system under consideration must have its own identification number. Arcs connect functional blocks with each other and represent elements (objects) that are transmitted from the outputs of some processes to the inputs of others. Arcs, depending on their position in the diagram, are already divided into 4 categories: input, output, control and mechanism. These categories may include: Materials, raw materials, products, resources; Information, data; Quality records; Documents; Executive orders, plans, schedules; Normative documentation, standards; The matrix of responsibility of performers (P50.028-2001, 2000; Kuryan A.G., Serenkov P.S., 2001; Oschman, J.J. 2017). The third basic concept of the IDEF0 standard is Decomposition. The decomposition principle is applied when dividing a complex process into its constituent functions. The level of detail of the process is determined directly by the developer of the model.
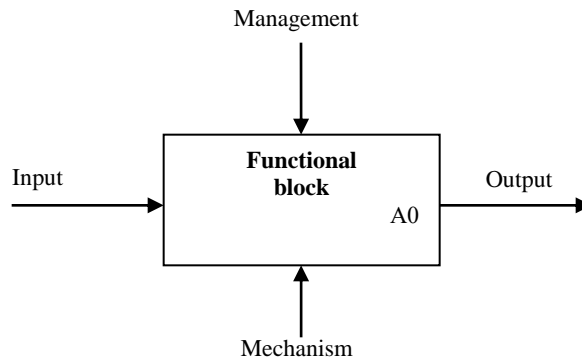
Figure 2. Functional block

Decomposition allows to gradually and structurally represent the system model in the form of a hierarchical structure of individual diagrams, which makes it easily digestible. The resulting second-level diagram contains the function blocks, that display the main subfunctions of the functional block of the context diagram and is called the subsidiary. In each case of decomposition of the functional block, all interface arcs included in this block or outgoing from it are fixed on the subsidiary diagram. This achieves the structural integrity of the IDEF0 model.

The last concept of IDEF0 is the Glossary. For each of the elements of IDEF0: diagrams, function blocks, arcs - the standard implies the creation of a set of relevant definitions and keywords that characterize a given object (Matveev A. S., Rudenko A. Yu., Prochukhan V.V., 2016; Tsaprilov D.A., Chudaev A.V., 2007).

The process map. When describing processes, a process map should be drawn up. The process map is used to visualize and describe all the processes of the enterprise, and also establishes the relationship between the organizational structure and processes when creating added value. A process can be considered manageable if the impacts on it allow achieving goals and planned results (Matveev A.S., Rudenko A. Yu., Prochukhan V.V., 2016; Bardakov A.A., 2016).

2.3 Assessment of business process indicators

The basis of business process management is the measurement of its performance and effectiveness indicators;
"Effectiveness - the degree of implementation of the planned work (activity) and the achievement of the planned results";
"Efficiency - the ratio between the achieved result and the resources used".
Three groups of indicators are often distinguished:
- costs of the business process, including the actual cost of the business process, calculated on the basis of the application of the ABC / CEA (Activity Based Costing / Cost-Effectiveness Analysis) methodology;
- temporal characteristics of the business process, cyclical nature, labor productivity;
- indicators of the quality of the business process (effectiveness).

When managing processes, vertical and horizontal "compression" of processes is possible (Ogvozdin V.Yu., 2009). Vertical "compression" is a reduction of the hierarchy of operations. Horizontal "compression" of processes - dividing a process into parallel branches, reduction of the time it takes to complete procedures. The

combination of the process approach with managerial accounting, a team form of work organization and a project based lifestyle is the basis of a new organization, an organization of the 21st century.

So, the need for the implementation of the QMS has "external" reasons for the company - access to the foreign market, competitive advantages among countries and firms.

However, "internal" reasons also have great importance: a greater awareness of quality; reduction of defects and costs of their removal; accelerating the production cycle and increasing labor productivity; positive cultural change, improved documentation management; increasing responsibility for the quality of their work; corporate culture, etc.

3. Creation of business processes for QMS at the Becker & K LLP enterprise

3.1 Analysis of the quality system effectiveness

Becker & K LLP is one of the first enterprises in Kazakhstan to introduce a quality management system in accordance with the requirements of the international standard ISO 9001. It is noteworthy that the quality management system was created here from the bottom up, not vice versa. This means that directly executing workers, heads of structural divisions developed procedures, process maps, instructions which are the basis of the mechanism of action of the management system.

Identification of environmental aspects and highlighting the most significant is an ongoing process that determines the past, present and potential impact of the Company's activities on the environment. All aspects of the Company in terms of environmental impact include two categories:
- direct (air emissions, wastewater, municipal solid waste);
- indirect (the effectiveness of the environmental management system, energy consumption, water use).

At the same time, the company integrated a food safety management system. This system allowed to concentrate the resources and efforts of the enterprise in critical areas of production, while sharply reducing the risk of producing and selling dangerous, non-conforming product standards. "Safety Planning" is an essential element in the formation of a security system, which allows ensuring food safety in the entire production and marketing chain. On this basis the process of achieving a high level of food product safety for the Company was modeled by consultants (Akhmetova S.O., Kulazhanova A.M., 2013; Quality manual of Becker & K LLP, 2015; Annual reports of Becker & K LLP, 2014-2018). It is presented in fig. 3.

The implemented food safety management system allows efficiently identify and eliminate potential risks and quickly respond to deviations from specified normative indicators exactly where they arise, without rebuilding the entire production process and reducing the total number of rejects, which means unjustified losses.

Thus, an integrated management system was gradually formed at the enterprise. The company launched such a system management that ensures strict adherence to the standards of ISO 9001, ISO 14001, ISO 22000, which does not allow for violations, and even more so, technological failures in operation, which allows us to guarantee the efficient operation of the Company as a whole.
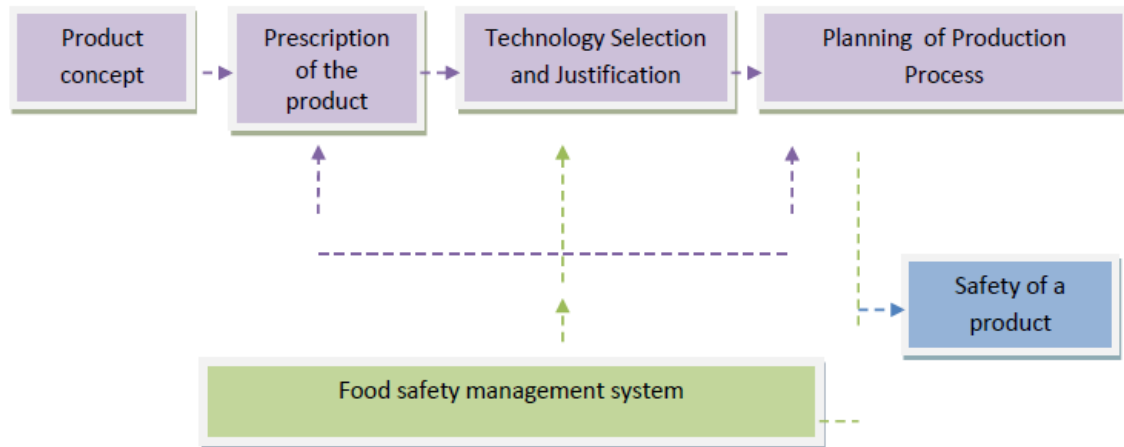
Figure 3. Model of the food product safety achievement process
Source: composed by the authors

Together, these three standards - ISO 9001, ISO 14001 and ISO 22000 - provide a powerful and complementary management system and make an equal contribution to the quality management, environment and food safety. The processes of the integrated management system, interacting with each other, preserve the integrity of the system when planning and implementing changes to it.

3.2 The development of business processes of the product life cycle on the example of the "To realize the release of product" process

A model of the organization's activity, an object of research engaged in the production of products, is proposed to facilitate understanding of the requirements of the ISO 9001 standard itself, as well as an example of constructing QMS. The model includes all standard processes, from design to service products. It represents a set of business processes of the organization with integrated requirements of ISO 9001:2015 (ST RK ISO 9000:2016; ST RK ISO 9001-2016; ST RK ISO 9004-2010 (IDT, ISO 9004-2009); ST RK ISO 10001-2009; ST RK 3.15.2-2009; ST RK 3.15.1-2009).

The IDEF0 functional modeling notation is used to describe the business process. The processes of the upper level of the model correspond to the key sections of the ISO 9001:2015 standard, then they are decomposed into subprocesses of the lower level directly in relation to the production and business activities of the organization.

One business process can be distinguished in the activity of the enterprise: "To realize the release of product". The inputs to this process are: a) external information, including the requirements of consumers (shops and companies); b) raw materials; c) resources. The outputs of the process are: a) finished products; b) information for external consumers (satisfaction). Process control is carried out on the basis of regulatory documents governing production processes in the enterprise. Considering that we are interested in the process from the point of view of quality management, we will consider regulatory documents regulating this area as external management. The decomposition of the business process at the enterprise is shown in Figure 4. Next, a map of the process is compiled (table 1).

Considering the goals of modeling - the compliance of the business process with the requirements of ISO 9001 - the decomposition of the business process includes 4 process units shown in Figure 5.
In accordance with the requirements of ISO 9001, the "To realize the release of products" business process includes the following processes:

- implement the responsibility of higher management on quality management;
- carry out resource management;
- implement life cycle processes;
- carry out measurements, analysis and improvement of QMS.
The interactions between the processes that make up the "To realize the release of products" business process is considered in figure 5, table 2.

The "To realize the responsibility of higher management on quality management" process is the governing process for all other processes. Accordingly, the output of this process - "Policy, goals, quality manual, quality programs" is the control input for all other processes shown in the diagram (Figure 5). The "To realize resource management" process has an "output – mechanism" connection with the "To realize life cycle processes" and "To perform measurements, analysis and improvement of the QMS" processes. The diagram shows the feedback loop: the output of the "To measure, analyze and improve the QMS" process with the input of the "To realize the responsibility of higher management on quality management" process.

The number of detalization levels of process is determined by the objectives of the simulation and the specifics of the activity of the simulated organization. In the framework of this methodology, the main goal of process modeling is to analyze the compliance of the process with the requirements of the quality management system.
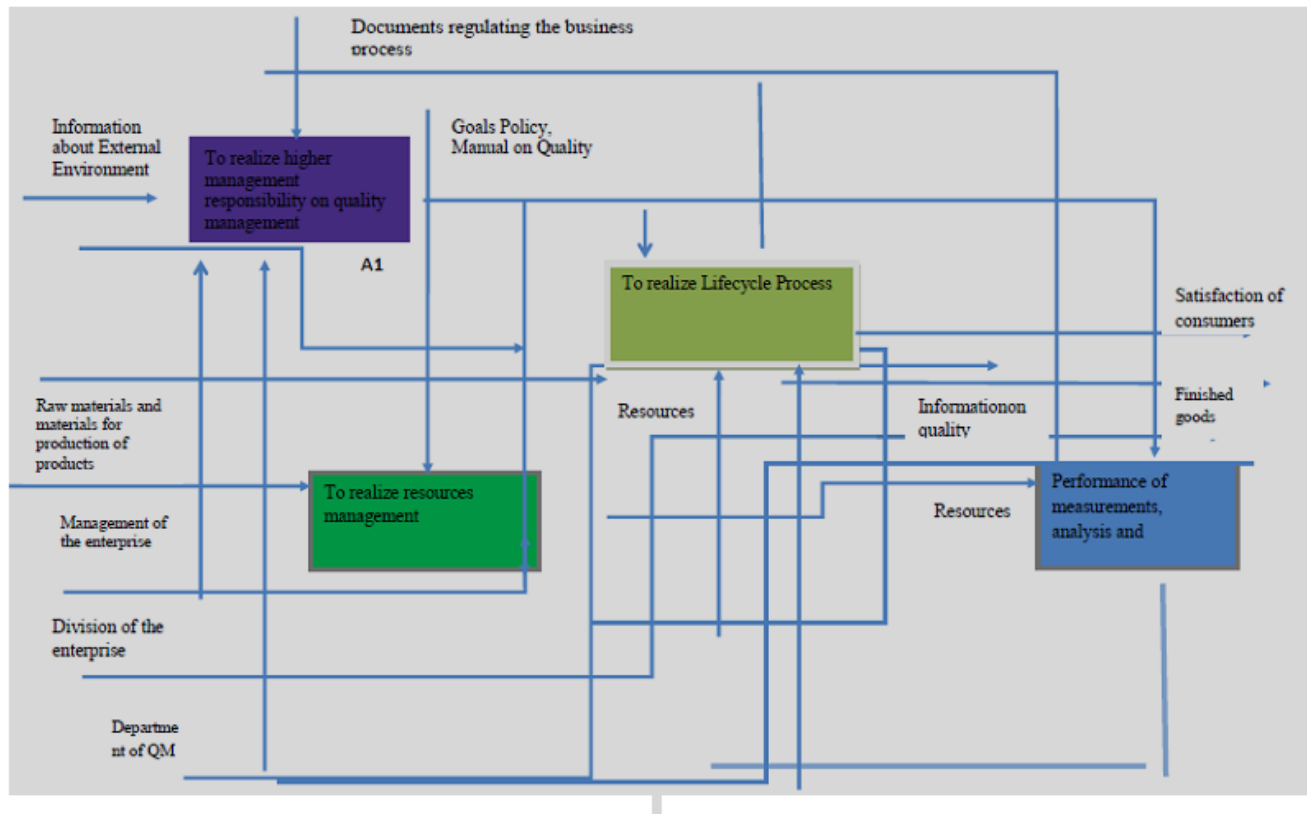
Figure 5. Decomposition of the process "Product release"
Source: composed by the authors

The "Product Release" business process at the diagram A0 is presented in the form of 4 processes. The diagram A0 is the first level of decomposition for this process. Each of the 4 presented processes, in turn, can be decomposed.

The authors have developed business processes of the quality management system.
The process cards required by the standard have been developed for all business processes.
Glossary - a set of relevant definitions, keywords that characterize a given business process. A common glossary has been developed for all diagrams.

The decomposition of work is terminated when the work of the lower level satisfies the following conditions:
1) The working process is clear and understandable to the manager and project participants (they are elementary);
2) The final result of each process and the overall work and the ways to achieve it are clear;
3) Timing characteristics and responsibility for the performance of work are uniquely defined.

4. Assessment of functioning efficiency of Becker & K LLP
PROCESS MODEL ACTIVITY

4.1 Analysis of the production and storage of products process at Becker & K LLP (on the example of the "Doctor's" cooked sausage production technology)

Becker & K LLP developed a process management model. This model provides four types of processes:
- system processes, which are divided into: document management, record management, non-compliance management, corrective and preventive actions, internal audit;
- management processes, which are divided into: strategic planning and improvement of IMS;
- business processes, which are divided into: analysis of consumer requirements, planning of production activities, technological preparation of production, production and storage, management of shipment of finished products, analysis of customer satisfaction;
- supporting processes, which are divided into: personnel management, information technology management, environmental management, equipment management; management of buildings and structures, construction management of new facilities, energy management, procurement, safety management, provision of vehicles.

As part of this section consider development of the process "Production and storage of product".
The first stage is the beginning the project performance. At this stage, internal and external initialization of the project is carried out.

The second stage is investigation. This stage includes a detailed view of the accounting areas and the specifics of the automated processes. At this stage, infological survey and survey of business processes, as well as their formalization, are carried out. Formalization of business processes includes the development of albums of functional diagrams, as well as diagrams of existing business processes in a customer's organization.

At the third stage, the system is designed. Design models of implemented subsystems are created, as well as prototypes of objects of the developed information system.

At the fourth stage, the technical specification is compiled. Also at this step an assessment of the complexity of solving the problem for all objects of the technical specification is carried out. At this stage, programming, testing, development of test cases and user documentation for the information system is carried out.

The fifth stage includes training and consulting users of the system. After that, the information system is put into use at the enterprise and its operation by users begins.

At the final stage, the results are formalized and the project is actually completed. The results of the project are summarized and project resources are released (Repin V.V., Eliferov V.G., 2013).

Let us present a description of the "Production and storage of product" process using the example of the production of cooked sausage "Doctor's" at Becker & K LLP.

3.2 Development of the "Production and storage of product" process on the example of cooked sausage production technology at Becker & K LLP

The process includes the following activities: ensuring the production of products of a given assortment that meets the requirements of standards and the requirements of the consumer for quality, in volumes established by production plans. Organization of operational production management (scheduling) is presented in Fig. 6.
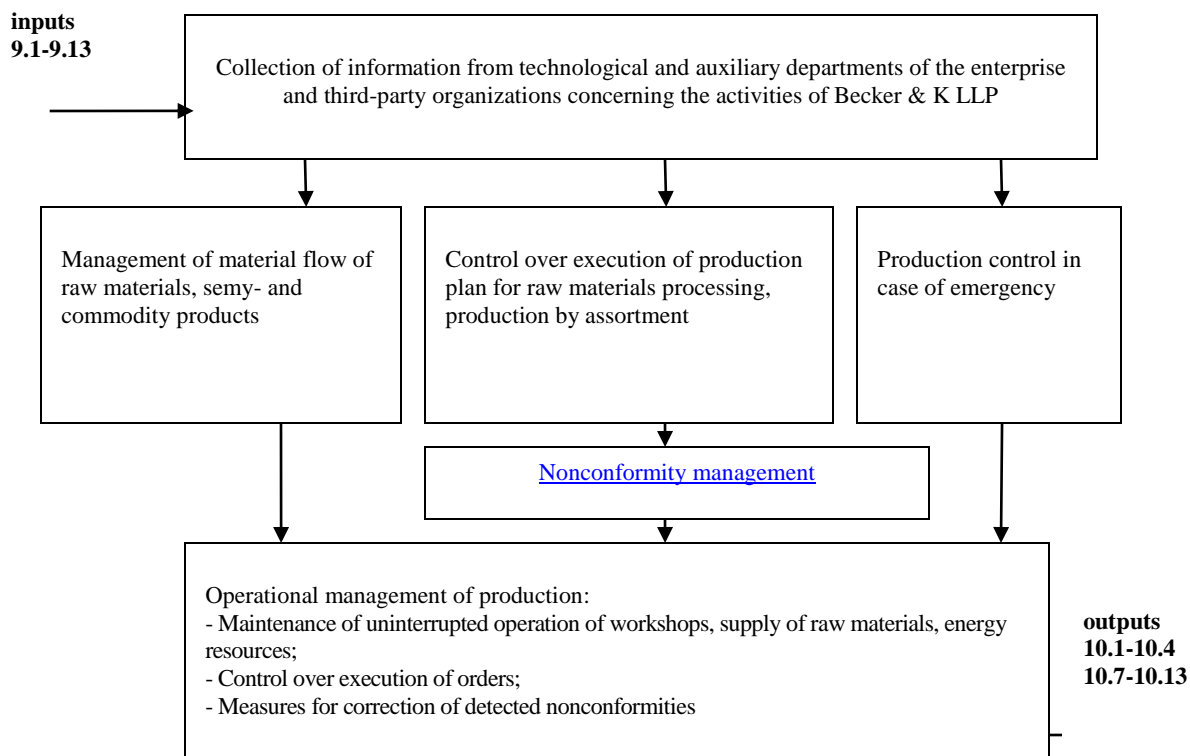
Figure 6. Organization of operational management of production
Source: composed by the authors

Then it turns into the process of intake, account, storage of meat raw materials.
Schematically the process can be presented in a form of figure 7.
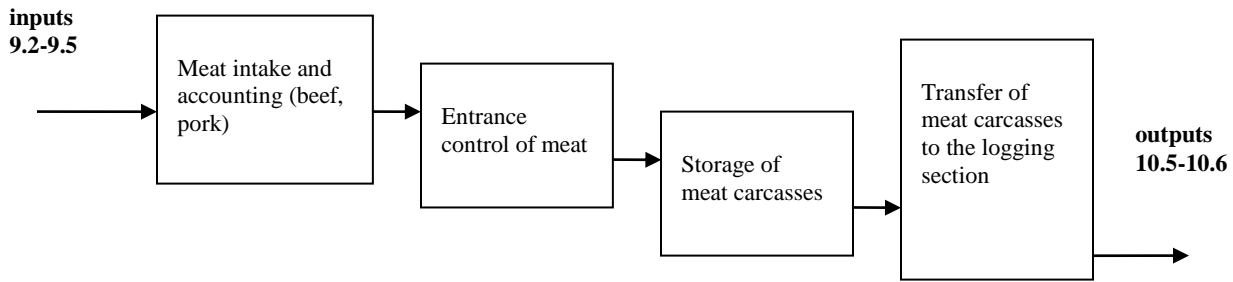
Figure 7. Scheme of intake, account, storage of a raw meat
Source: composed by the authors

The next stage is the primary processing of meat and the production of marketable meat products. This stage can be distinguished as the main process of a meat processing plant, since it starts the processing of raw materials and turning it into finished products. Marketable meat products and the marketable product (cooked sausage) production process is presented in the form of a diagram in Figure 8 (Rogov I.A., Zabashta A.G., Kazyulin G.P., 2000; Rogov I.A., Zabashta A.G., Kazyulin G.P., 2009).
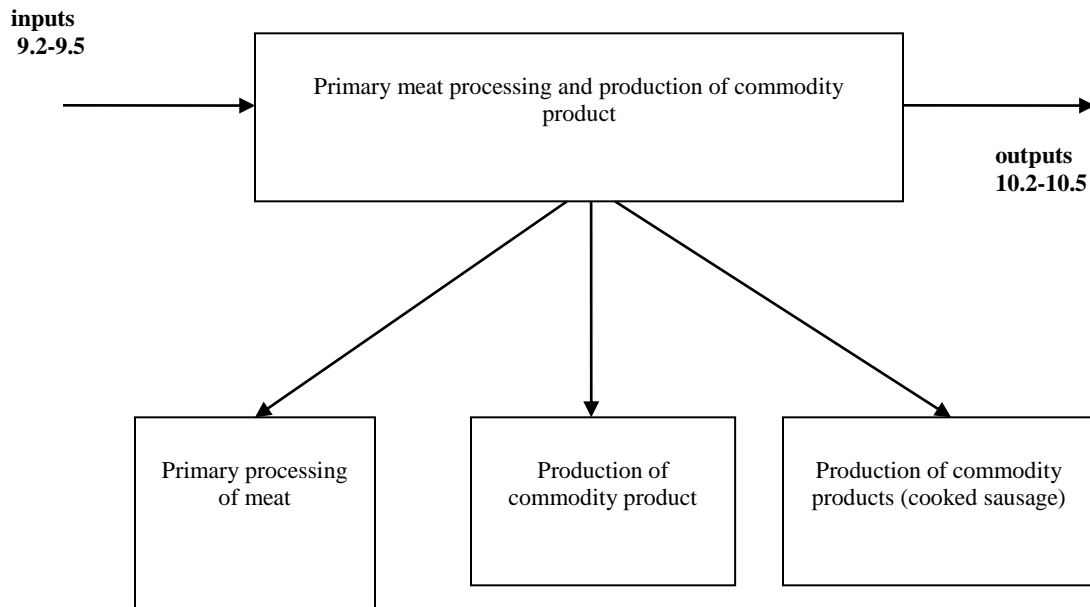
Figure 8. Primary processing of meat and production of marketable products
Source: composed by the authors

Processing of raw materials and production of meat products with a view to their further realization in the domestic and foreign markets is presented in Figure 9.
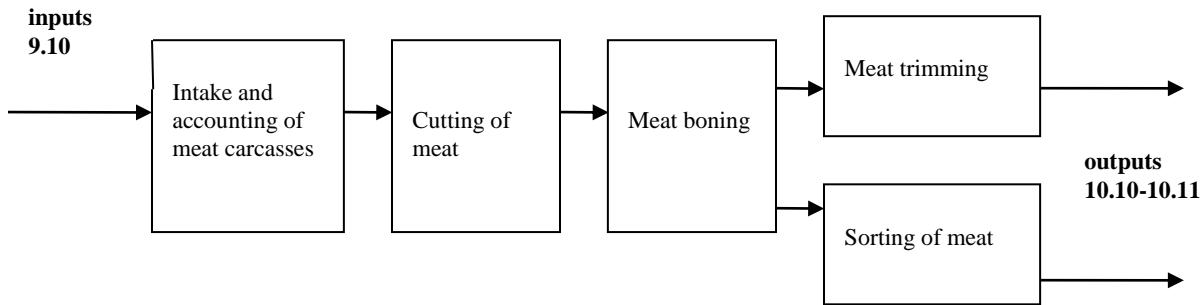
Figure 9. Primary processing of meat carcasses
Source: composed by the authors

Chopping, salting and ripening of meat, as well as the preparation of minced meat are presented in Figure 10.
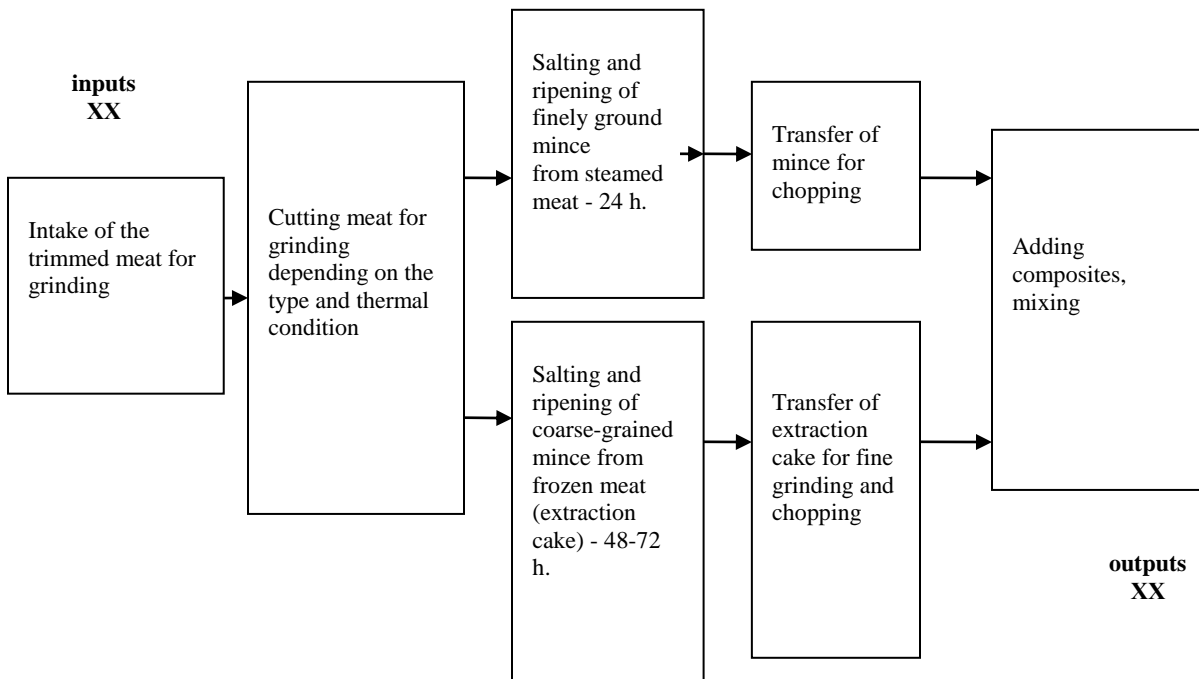
Figure 10. Preparation of minced meat
Source: composed by the authors
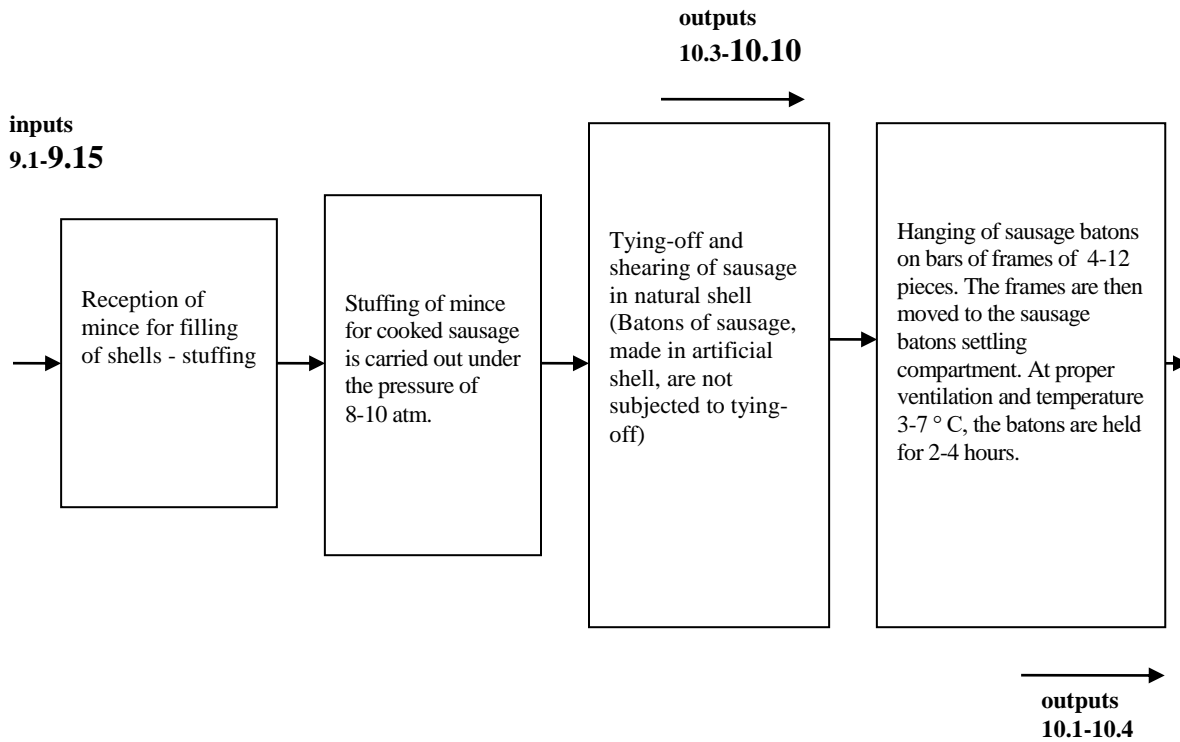
Figure 11. Stuffing, tying-off and sedimentation
Source: composed by the authors

After that the process of heat treatment (cooked sausages) and cooling, storage and shipment of marketable products are carried out (Figure 12).
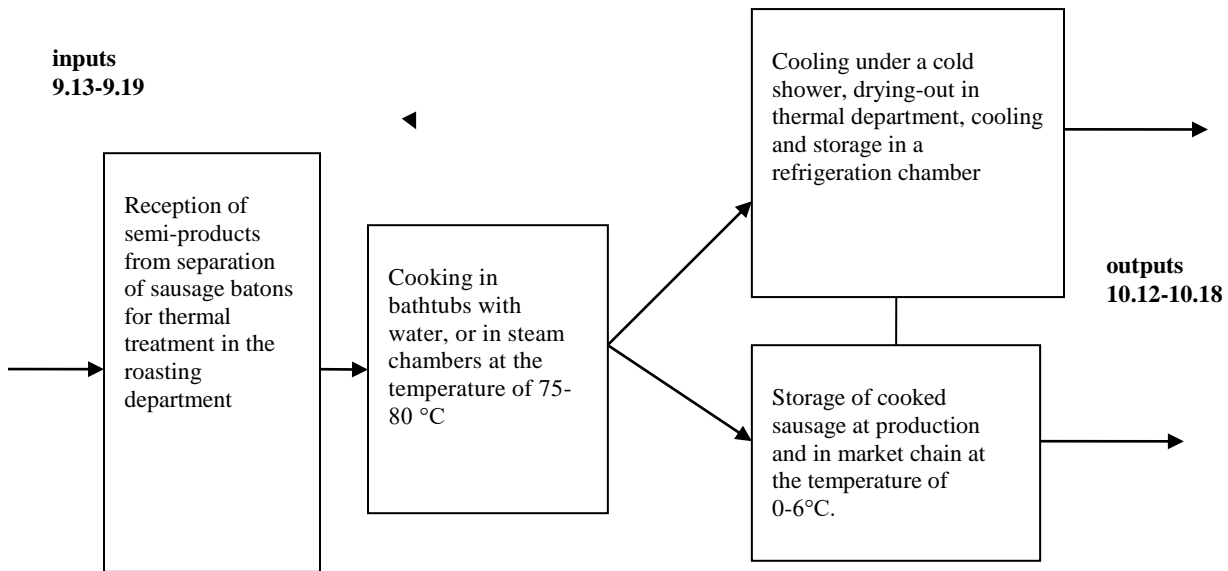
Figure 12. Receiving of marketable meat products, storage and shipment
Source: composed by the authors
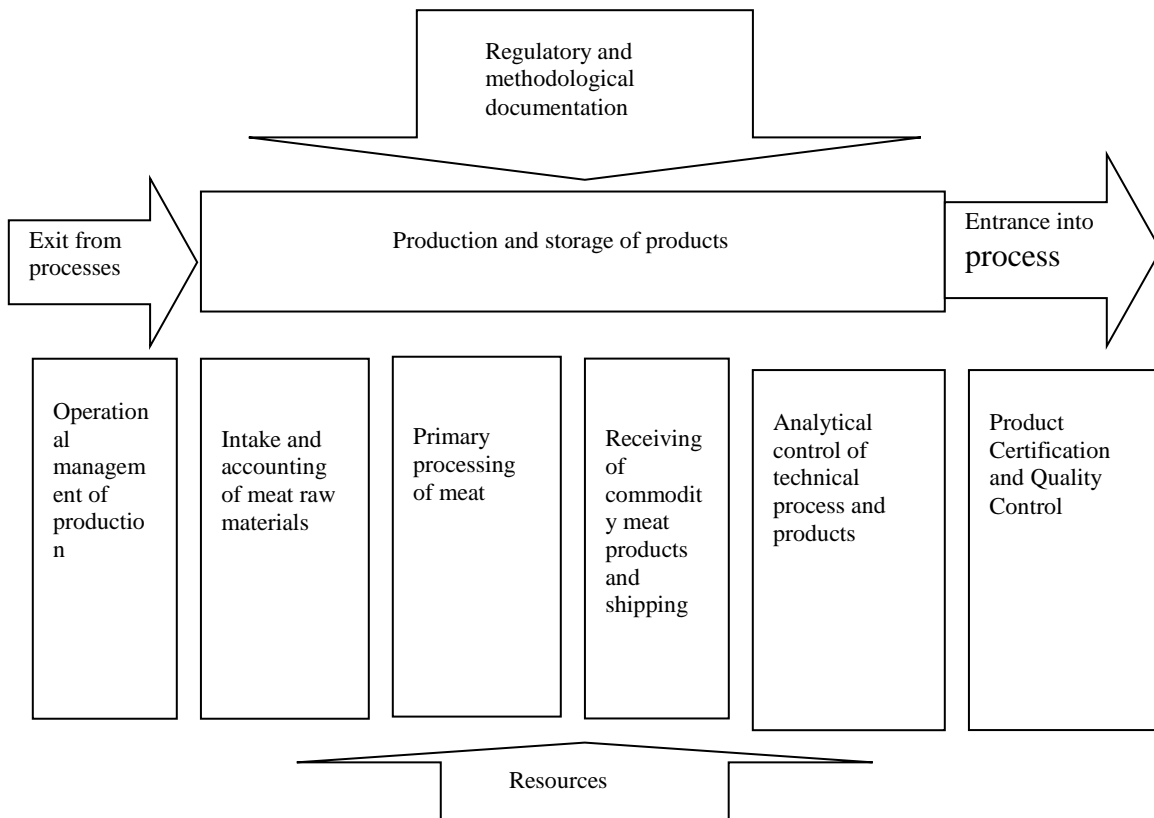
Figure 13. Process of the top level *Source:* composed by the authors

The process ends with analytical (operational) control of the technological process and products.

Risks of the process of production and storage of products:

- non-fulfillment of the production plan, financial losses;
- claims and complaints of consumers;
- low profitability of production, loss of market;
- loss of the image of the enterprise .

In general, the "Production and storage of products" process is represented in figure 13.

Thus, the process of production and storage of products is the interconnection of the following activities: ensuring the production of products of a given assortment that meets the requirements of standards and the requirements of the consumer for quality, in volumes established by production plans. Based on the foregoing, it is necessary to analyze the effectiveness and efficiency of the production process and storage in order to reduce and prevent the risks stated above.

4.2 Assessment of the effectiveness of the process based approach in the activities of Becker & K LLP

Assessment of effectiveness involves two components: evaluation of the effectiveness of the quality management system and evaluation of the effectiveness of the processes of this system. Of particular importance for assessment the effectiveness of processes is the availability of criteria, ranked by degree of importance for the process. The importance of the criteria is determined by the consumer of the process results.

For assessment of QMS processes effectiveness the technique "The analysis of criteria for evaluation of processes of a quality management system" was used (Kuryan A.G., Serenkov P.S., 2001). The main goal of development of this technique is the description of the assessment procedure of criteria of process based on their ranging on importance degree for the analysis of effectiveness of process.

In the framework of this work, a technique for developing the effectiveness of the "Production and storage of products" process was considered (Tsaprilov D.A., Chudaev A.V., 2007). The developed technique provides the gradation of criteria, which takes into account the importance of each criterion for a particular process:

      1) Needed;

      2) Unimportant;

      3) Medium importance;

      4) Very important;

      5) Maximum importance.

When determining the rating scale, the range into which a particular criterion should fall is determined, the maximum number of points is assigned to the best criterion value. In order to avoid cases of incorrect assessment of the effectiveness of the process according to existing criteria, a "generalized indicator" is proposed, i.e. if there are two or more criteria of the same type in the process (effectiveness, efficiency, etc.), it is necessary to use a generalized indicator for decision-making in the analysis of the process. A complex (integrated) indicator can be considered as a synonym for a generalized indicator. To calculate the generalized indicator, it is necessary to calculate all the process criteria for a certain period (Matveev A.S., Rudenko A.Yu., Prochukhan V.V., 2016; Bojkovska K., Tomovska J., Shariati M. A. 2014; Detmer W., 2012).

In the developed technique, interpretation options for the results of the obtained value of the generalized indicator are provided, further the range may change, which can be seen in table 2.

Table 2. Generalized indicator of effectiveness *(Source:* composed by the authors)

97 – 100%	The process is productive.
80 – 97%	The process is productive, but needs improvement.
70 – 79%	The process is conditionally effective, requires corrective action
less than 70%	The process is ineffective.

This calculation of the generalized indicator is carried out with the frequency indicated in the specification for the process. In order to assess the effectiveness of the QMS as a whole, as well as ensuring continued suitability, adequacy of the system, the "Assessing the suitability, adequacy and effectiveness of the QMS" technique was developed. This technique establishes a procedure for evaluating the QMS of a factory. The suitability of the QMS is determined on the basis of customer satisfaction, as well as the achievement of quality goals. QMS is considered suitable when receiving more than 80% of positive responses.

The adequacy of the QMS is the conformity of the requirements of the QMS to the requirements of international standards and the requirements of consumers. The adequacy of the QMS is determined based on the results of audits. QMS is considered adequate when receiving more than 80% of positive responses.

The effectiveness of QMS is one of the most important stages of its functioning, in which the enterprise is able to manage interconnected processes as a system. The effectiveness of QMS is determined on the basis of data on the course of processes and the conformity of products, the status of corrective and preventive actions, as well as actions taken based on the results of previous analyzes by the management. Table 3 presents the effectiveness of the quality management system (Kuryan A.G., Serenkov P.S., 2001; Bardakov A.A., Kornilov D.A., 2017).

Table 3. The effectiveness of QMS

Information	Information content (evaluation criteria)	Score Yes/1 No/0	Remarks
QMS Processing Data	Is the process productive? (data on top-level processes are considered)	1	"Provision of qualified personnel" - effective.
		1	"Quality Management" - effective.
		1	"Production and shipment of products" - effective.
		1	"Technological support" - effective.
		1	"Purchases of raw materials and materials" – effective.
		1	"Provision of workable equipment" - effective
Product Compliance Data	Does the level of product quality meet the plan?		
The degree to which decisions of previous analyzes are implemented by management	Are the solutions of the previous analysis implemented?	1	All decisions of the previous analysis are implemented.
	Are the deadlines met?	1	Deadlines are met

Source: composed by the authors

All the features of the application of the process approach in industry were taken into account while developing the techniques. It results in the possibility of drawing real conclusions about the effectiveness of the developed model of the QMS process after the start-up of the plant and the start of production. Criteria for evaluating the effectiveness of the "Production and storage of products" process will be found. The application of this technique allows the company to conduct a periodic QMS assessment and guarantee to consumers that all their requirements and expectations regarding the quality of finished products, and production technologies and control methods are fully implemented (Dentovskaya Yu.S., 2016; Ishimova A.Yu., Gareeva G.A., 2015).

Conclusions

Implementation of process approach at the industrial enterprise is caused by a number of features. The most significant features are: a large number of processes, complexity of their performance and assessment of effectiveness, big number of staff, huge number of standard and technical documentation, wide nomenclature of the purchased raw materials and materials, specificity of the capital equipment.

At the same time implementation of process approach promotes steady and productive functioning of the industrial enterprise in market conditions of managing. Realization of process approach assumes use of various tools: description of the scheme of a stream of processes, modernization of processes, description of their inputs and outputs, effectiveness assessment.

As a result of the done work the following tasks were solved:

- Theoretical and methodological basics of quality management and development of business processes of the enterprise are covered;
- The analysis of the quality management system at the Becker & K LLP enterprise is carried out and business processes of QMS on IDEF0 methodology are developed;
- On the example of business process "To realize product release" actions for improvement of the mechanism of the business processes management system at the Becker & K LLP enterprise are developed;
- The process model of management, and also action for improvement of activity of the enterprise is developed. The analysis of development of the enterprise activity process model on the example of Becker & K LLP is carried out. Process of production and storage of products is considered and also the technique of assessment of effectiveness of process approach for the enterprise is offered;
- the business management subsystems including target, functional and organizational subsystems and a subsystem of interaction with the external environment are systematized and their interaction with a quality management subsystem is defined.

The estimated practical implication is that its recommendations have purposeful character in the conditions of market economy and allow increasing effective quality management at the enterprise. Implementation of offers on introduction and improvement of process approach at management of the industrial enterprise allows using rationally resources of the enterprise for ensuring the level of quality of products meeting requirements of consumers.

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INVESTIGATING THE RELATIONSHIP BETWEEN ENTREPRENEURIAL ACTIVITY AND ECONOMIC GROWTH: A CASE OF MIDDLE EAST

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Abstract. The current research is aimed at investigating the relationship between entrepreneurial activity and economic growth, more specifically, in the context of Middle East countries. Entrepreneurial activities are professed to improve the economic development of the country through employment generation, increase in the rate of gross domestic product (GDP), increased productivity levels, poverty alleviation, and so on. Based on the possibility of these positive aspects, economic growth is considered to be driven through increased entrepreneurial activities, in the context of developing countries. To investigate this relationship between research variables, quantitative data was collected using the World Bank database of 8 Middle Eastern countries for the period 2009-2016. Based on the correlation and regression results, the study finds a significant positive impact of entrepreneurial activity (measured as new businesses registered) on economic growth (GDP growth) in the Middle East. Therefore, it is important for states in the Middle East to focus on promoting entrepreneurial activity, which influences economic growth.

Keywords: entrepreneurial activity; economic growth; Middle East; new businesses registered

1. Introduction

Later in the decade of the 20th century, associations between entrepreneurship and economic development have been studied extensively (Savrul, 2017). It is to be noted that the main concern of such studies concerning the impact of entrepreneurial activity on economic performance is linked with industry or firm level, while there is a dearth of its contribution at country level. Notably, entrepreneurial activity is professed to improve the economic growth of the countries. Based on this premise, small businesses are given immense significance in the economy of the country (Gerçeker, Özel, & Ay, 2014). Ivanović-Djuki et al. (2018) argue that the rising share of entrepreneurs and small and medium-sized enterprises (SMEs) have substantially changed the perception of economists with regards to driving factors of economic growth.

Fundamentally, entrepreneurship is distinguished as the instigation of new economic activities along with the improvement in the existing activities by introducing new products, processes, as well as markets (Gerçeker et al., 2014). It is also stated that entrepreneurial activities involve such functions that are aimed at transferring the country's resources from low-productive areas to such areas where economic productivity is even higher. In addition, the positive economic attributes such as employment creation, poverty alleviation, increased growth in income per capita, competitive growth, along with societal welfare are linked with entrepreneurial activities (Ivanović-Djuki et al., 2018; Ribeiro-Soriano, 2017). In this consideration, it is widely asserted that entrepreneurship largely contributes to the economic growth of countries by increasing their GDP rates which consequently enhance the quality of lives.

Furthermore, in context of developed countries, SMEs and other entrepreneurial activities demonstrate a positive influence on economic development, however, the impact of entrepreneurship in the economic growth of developing countries lacks the empirical evidence which needs to be determined (Sautet, 2013). Doran, McCarthy, and O'Connor (2018), in this concern, mentioned that importance of entrepreneurship greatly varies across middle or low-income and high-income countries. Ács et al. (2014) also claimed that entrepreneurial activities do not receive sufficient treatment in the context of a country-level phenomenon and its impact on economic development. Devece, Peris, Ortiz, and Armengot (2016) contends that entrepreneurial activities are mostly necessity-based in developing countries.

Furthermore, as a result of entrepreneurial activities, competition among existing companies is largely increased which, in turn, improves the productivity levels and thereby, economic outputs. Savrul (2017) further claims that in the absence of entrepreneurial activities, economic growth is likely to be reduced. Moreover, with the evolution of knowledge-intensive businesses, entrepreneurship has seen a rise, wherein, small businesses play a pivotal role in improving economic growth. More precisely, entrepreneurship is referred to as the mechanism of 'creative destruction' as innovation efforts of entrepreneurs enable the companies to present new and improved inventions which, in turn, make existing technologies and products obsolete. Presumably, Kritikos (2014) mentioned that albeit 1 to 2% of the workforce instigate businesses in any particular year, despite the fact, innovative entrepreneurship is critical to the competitive economy and creation of new jobs in both short and long run.

2. Literature Review

Entrepreneurial Activity
Broadly speaking, Entrepreneurship is referred to as the phenomenon which embraces entrepreneurial activities. More precisely, this phenomenon is related to the creation of jobs, management of inequalities as well as environmental issues (Boutillier and Uzunidis, 2016). In accordance with the definition presented by OECD (2015), entrepreneurship greatly varies in its activities and therefore, generates varying results which are not necessarily related to wealth creation. OECD has identified three main constituents involved in this phenomenon which include entrepreneurs, entrepreneurship, and entrepreneurial activity. More precisely, entrepreneurs are the business owners who intend to create value by improving their economic activity by means of seeking and exploiting innovative products, processes as well as markets. However, entrepreneurial activity is signified as the human actions which are aimed at creating value by undertaking those economic activities. Link (2017) recognizes 'entrepreneurial activity' as activities that are pertinent to creation, management, development, and death of small independent companies. It was also mentioned that entrepreneurial activity may be the outcome of either necessity or opportunity.

Additionally, to seek and take advantage of business opportunities is imperative for entrepreneurs. With the help of these opportunities, entrepreneurs are capable of either developing new companies or bring improvement in the existing ones. Amiri and Marimaei (2012) state that entrepreneurship is the capacity of individuals to realize

innovation and creativity in the business to achieve a competitive advantage. Juturu (2018) further mentioned that in order for a country to create wealth, address socioeconomic issues and to promote the status of a nation in a globalized scenario, it is indispensable to improve its entrepreneurial activities. Boutillier and Uzunidis (2016) mentioned that the Global Entrepreneurship Monitor (GEM) is utilized as a tool to study entrepreneurship activities at international level. This entails both qualitative and quantitative indicators. In particular, qualitative indicators include profiles of entrepreneurs, their aspirations, methods of creation, fear of failure, etc., whereas, the list of an established business is one certain qualitative indicator of entrepreneurship.

Role of Entrepreneurial Activity in Economic Growth
As stated earlier, entrepreneurial activity is the driving force within country's economy, more specifically, due to innovative nature of entrepreneurs who proactively seize business opportunities in order to gain economic benefits (Dahliwal, 2016; Antonie, Feder and Munteanu, 2017; Doran et al., 2018; Ribeiro-Soriano, 2017). Additionally, the construct of 'entrepreneurship' is professed to increase the competitiveness, create employment opportunities, bring innovation to improve productivity, and thereby improving the economic growth of the country (Amaghouss & Ibourk, 2013). Savrul (2017) supports the stance that economic growth can be achieved by means of entrepreneurship capital which boost the number of firms and thereby competition is raised in the market. In addition to this, not merely the number of enterprises is enhanced but also, a variety of enterprises are established using this capital. Thus, it can be said that entrepreneurial activities can play a significant role in enhancing economic growth.

Increased GDP Growth
It is to be noted that, economic growth of any country is measured through its GDP rate which is distinguished as the monetary value of country's goods and services during one-year period excluding the price range or monetary value of goods and services which are consumed during the process of production (Yusuf and Albanawi. 2016). Presumably, the impact of entrepreneurial activity on the economic development of a country substantially differs based on the stage of economic development where a country lies (Ferreira, Fayolle, Fernandes, & Raposo, 2017). In this context, economic development in developed and developing countries also differ, and thereby, the effects of entrepreneurial activities also differ. In this regard, the study of Aubry, Binnet, and Maissant (2015) assert that domestic productivity produced by entrepreneurial activities in developing countries is different as compared to developed countries. For instance, countries such as Canada, USA, Australia have high economic growth based on the fact that these countries place a high value on entrepreneurship and actively support and assist the entrepreneurs in formation, expansion, and growth of the business (Ogunlana, 2018).

In addition, governments also finance their start-up business activities through venture capital. Study of Castaño-Martínez et al. (2015) has suggested that increased investments in Research & Development, and education related to entrepreneurship is likely to enhance the economic performance of the country. Moreover, Fariyibi (2015) established that approximately 8.4 million SMEs operate in Nigeria which greatly contributes to the national output. More particularly, the entrepreneurial activities of these small businesses contribute about 75% in the revenues. This implies that increased financial investment in the entrepreneurship activities may significantly improve the GDP growth of countries. Afolabi (2015) further affirms this finding stating that Nigeria's economic growth has been increased continually based on the governmental initiatives to foster the growth of SMEs. Furthermore, Bampoky et al. (2013) analyzed the entrepreneurship data of both developing and developed countries over the years 2003-2011. Their study found that since less developed countries lack entrepreneurship have lower economic growth, in contrast, high-income developed countries, entrepreneurship activities are optimum which enhances their economic growth.

Employment Creation through Entrepreneurial Activity
Entrepreneurship is accentuated as significantly related to the economic development of countries and therefore, is referred to as a notable source of employment creation. Undoubtedly, both large corporations and SMEs create

jobs for people as a large number of firms are established due to increased competition. Cieślik (2014) claimed that most of the jobs are created by small firms, in particular, it was suggested that 66% of the employment in US economy was generated by SMEs which had staff less than 20. While 16% of the jobs were the creation of enterprises comprised of 20 to 99 people. In accordance with the Kritikos (2014), in circumstances when economic growth becomes stagnant and the unemployment rate is high, entrepreneurial activities can help improve economic growth. This is due to the fact that entrepreneurs who leverage from business opportunities and create new markets, demand for the workforce is boosted to develop innovative products.

Consequently, job opportunities are increased while unemployment is substantially reduced. It is to be noted that opportunity entrepreneurship is more likely to generate employment as it is professed to have a high potential to grow (Fairlie & Fossen, 2018). Moreover, the major entrepreneurial factors involved in job creation include the size of firm, training, available resources, alongside the history of entrepreneurship (Rey-Martí et al., 2016). Regarding this, Kucel (2016) has mentioned the active role of government in investment in entrepreneurial education with the purpose to achieve self-employment and employment generation.

Elimination of Income Inequality
Evidently, entrepreneurial activities are anticipated to bring along the positive returns in terms of profit, income generation by the integration of innovative business practices. Martin, Picazo, and Navarro, (2010), in this regard, opined that the capitalist approach is restricted so as to mitigate income inequality while encouraging equal income distribution. Albeit, entrepreneurial activities are regarded to reduce unemployment rates, nevertheless, Lecuna (2014) has suggested that there lies a positive and linear relationship between entrepreneurial activity and income inequality. Consistent with the disequalizing model, it is assumed that income inequality is increased over the succeeding generations. Moreover, entrepreneurs are considered to accumulate more income as compared to workers, which in turn, concentrates the wealth amid entrepreneurs in developed countries. Furthermore, Kwark and Ma (2016) stated that an expanding economy which assists entrepreneurship activities is likely to create opportunities for entrepreneurs. Study of Gutiérrez-Romero and Méndez-Errico (2017) found that although necessity entrepreneurship increases in number due to increase in inequality, however, it is also likely that entrepreneurial activity will reduce due to this inequality as businesses would not be created.

Since entrepreneurship contributes in the economic development of the country by creating jobs, enhancing value-added as well as per capita incomes, in this regard, increased inequality can be detrimental on entrepreneurial activity in case the huge proportion of individuals will be prevented to take up profitable investments. Amorós and Cristi (2010) also mentioned that necessity-based entrepreneurship that is prevalent in developing countries is linked with human development as well as inequality income in these countries. This income inequity further urges individuals to instigate entrepreneurial venture to reduce this inequality and promote economic growth.

3. Research Methodology

Research Approach
Widely used research approaches are deductive and inductive. In particular, the deductive approach is referred to as the process of developing hypotheses and theory (Quinlan, 2019). In this approach, the researcher collects and interprets data in relation to theories and proposed hypothesis. However, in the inductive approach, a theory is developed after analysis of data. In the current study, the researcher has adopted the deductive approach based on its appropriateness that relates to the research topic that is to investigate the relationship between entrepreneurial activity and economic growth.

The researcher has adopted the top-down approach to gain insights on aspects of economic growth which are impacted by entrepreneurial activities. In the context of the philosophical stance, this research has selected quantitative approach wherein researcher rely on numerical data analysis to present the coherent findings that

could be generalized (Anderson et al., 2015). In this study, the researcher has attempted to generate logical findings through numerical data obtained for assessing the impact of entrepreneurial activity on economic growth in Middle East countries.

Research limitation
Economic growth is affected by myriad of factors. In this reseach we make and assumption that other factors do not distort relationship entrepreneurial activity and economic growth.

Research Design
Research design is referred to as the framework of the entire study that assists the researcher to achieve established research aims and objectives. Rubin and Babbie (2016) have mentioned different research designs that are widely used by researchers which include descriptive, experimental, case study, correlational and so on. In the current research, the purpose is to examine the impact of entrepreneurial activity on economic growth. Concerning this, the correlational research design is considered to be more appropriate as it facilitates the researcher in examining the relationship between variables of economic growth and entrepreneurial activity (Hair et al, 2015). Besides, the correlational design is helpful in assessing the strength of the relationship between proposed research variables using varied statistical techniques. Furthermore, this design is helpful in examining the influence of entrepreneurial activity on economic development as there is a dearth of empirical findings pertinent to this association in the context of countries.

Data Collection
Collection of data is the crucial stage in research work. This data collection process facilitates the researcher in gathering valuable information so that reliable and valid findings could be generated. O'Connor (2015) states that the methods of data collection also vary with respect to the research approach and design. As stated earlier, current research adopts a quantitative approach and correlational research design, data were collected from secondary sources. Secondary data are considered to be valuable evidence source (Hoffmann, 2017). In the present research, the researcher has used secondary quantitative data available on the World Bank database. The sample size of the study includes 8 Middle Eastern countries, where the data relates to the period 2009-2016. Therefore, a total number of observations is 64. Utilizing this data, the researcher critically analyses the influence of entrepreneurial activity on the economic growth of Middle East countries.

Data Analysis
It is the process in the research wherein the researcher is required to carry out a meticulous analysis of gathered data. This stage involves the interpretation of data so as to convert into valuable information and findings that can be generalized (Creswell, 2017). In general, data analysis largely depends on the type of data (quantitative and qualitative data). As the current research has undertaken quantitative data, statistical tools are utilized to analyze the numerical data. The data analysis tools specifically used for the study are descriptive statistics, correlation and regression analysis. In particular, descriptive statistics help in summarizing the data. Correlation analysis assists in assessing the relationship between entrepreneurial activity and economic growth, whereas regression assesses the impact and the nature of this relationship between the proposed variables. Certain control variables are also included: inflation, gross capital formation, and labor force.

Following formula will be used to assess the relationship between entrepreneurial activity and economic growth of Middle East countries.

GDPG =β0+β1NRB+ β2GCF+ β3LF+ β4INFε

Where;
GDPG, NRB, GCF, LF, and INF represents GDP growth, new registered business, gross capital formation, labor force, and inflation respectively.

Findings and Analysis
Based on the aforementioned methodology, the extracted data from the World Bank has been entered in SPSS software. This section of the paper particularly sheds light upon the findings from the data available for 8 of the Middle Eastern Countries. Out of the total 16 Middle Eastern states (categorized on World Bank Database), only 8 were considered as part of the study based upon the availability of the complete data set during the period 2009 till 2016. The analysis of the collected information is divided into three parts; Descriptive Analysis, Correlation Analysis, and Regression Analysis.

Descriptive Statistics
For the identification, the mean value of the four research variables of the study based on the selected countries, the following Table 1 is formulated using SPSS custom tables feature. The results from the same indicate that the average GDP growth of Jordan remained the highest with 6% average growth in the number of registered businesses over the span of 9 years. Cyprus, on the other hand, reflect the lowest economic growth (average) as well as negative growth seen in terms of the entrepreneurial activities. Moreover, Oman is seen to have been the most prominent place for investment as it reflects the highest average growth in the entrepreneurial firms in the country.

Table 1. Mean Variables on the basis of different Countries

Mean Variables on the basis of different Countries	GDP Growth	New businesses registered (% GROWTH)
	Mean	Mean
United Arab Emirates	2%	14%
Cyprus	-4%	-5%
Iraq	5%	-2%
Israel	5%	1%
Jordan	7%	6%
Oman	2%	27%
Saudi Arabia	4%	10%
Turkey	2%	12%

Overall, Table 2 show that the Middle Eastern countries reflect an average growth of 3.02% (0.0302) with the annual inflation rate (average) remaining as high as 2.68%. The average growth in Gross capital formation and labor force of the Middle East region is 3.16% and 4.25% respectively. Furthermore, the number of firms registered over the span of 9 years in the Middle Eastern Region revealed 7.78% average growth. Though the entrepreneurial activities in the Middle East are seen to have deviated from the mean value by 22.73% overall.

Table 2. Descriptive Statistics (Middle East)

Descriptive Statistics (Middle East)	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic
Gross capital formation (% growth)	64	-0.39	1.15	0.0316	0.23291
GDP Growth	64	-0.24	0.34	0.0302	0.12213
Labor force (% growth)	64	0.00	0.14	0.0425	0.03177
Inflation, consumer prices (annual %)	64	-2.19	8.89	2.6873	2.75750
New businesses registered (% GROWTH)	64	-0.46	0.86	0.0778	0.22731
Valid N (listwise)	64				

Correlation between Entrepreneurial Activity and Other economic indicators Table 3 show that Entrepreneurial Activities are the major source of boosting the overall economic growth of the developed regions. In the case of developing countries however, the results reflect a negative relationship between the two variables (Piotr & Rekowski, 2009).

In order to assess the relationship between the current research variables, Pearson Correlation has been used. The results from the same indicate that their lies a positive relationship (0.249) between the entrepreneurial Activities (Number of registered businesses) in the Middle East region with correlation coefficient remaining significant at 0.05 level of significance. In addition to this, the other control variables except for labor force reflects a significantly positive association.

Table 3. Correlations

Correlations

		Gross capital formation (% growth)	GDP Growth	Labor force (% growth)	Inflation, consumer prices (annual %)	New businesses registered (% GROWTH)
Gross capital formation (% growth)	Pearson Correlation	1	.529**	0.060	0.131	.280*
	Sig. (2-tailed)		0.000	0.640	0.304	0.025
	N	64	64	64	64	64
GDP Growth	Pearson Correlation	.529**	1	0.081	.268*	.249*
	Sig. (2-tailed)	0.000		0.523	0.032	0.048
	N	64	64	64	64	64
Labor force (% growth)	Pearson Correlation	0.060	0.081	1	0.075	.363**
	Sig. (2-tailed)	0.640	0.523		0.555	0.003
	N	64	64	64	64	64
Inflation, consumer prices (annual %)	Pearson Correlation	0.131	.268*	0.075	1	0.174
	Sig. (2-tailed)	0.304	0.032	0.555		0.168
	N	64	64	64	64	64
New businesses registered (% GROWTH)	Pearson Correlation	.280*	.249*	.363**	0.174	1
	Sig. (2-tailed)	0.025	0.048	0.003	0.168	
	N	64	64	64	64	64

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Impact of entrepreneurial activity on Economic Growth (with control variables).
While assessing the influence entrepreneurial activities on the overall economic growth of the Middle Eastern countries, the linear regression has been performed using GDP growth as a dependent variable while entrepreneurial growth as an independent variable. Inflation (annual %), the Labor force (% growth) and the Gross capital formation (% growth) has been taken as the control variables. Table 4 shows that he results from the fitted regression model reflect an R-square value of 0.327. This indicates that the fitted model is able to explain 32.7% variation in the economic growth of the Middle East region of the world, due to changes in the independent variables.

Table 4. Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. The error of the Estimate
1	.571[a]	0.327	0.281	0.10357

a. *Predictors: (Constant), the Labor force (% growth), Gross capital formation (% growth), Inflation, consumer prices (annual %), New businesses registered (% GROWTH)*

Table 5 show that The F test value of 7.152 is also seen to be significant at 0.01 level of significance reflecting the combined effect of all the independent variables on the economic growth of the region.

Table 5. ANOVA

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	0.307	4	0.077	7.152	.000[b]
	Residual	0.633	59	0.011		
	Total	0.940	63			

b. *Dependent Variable: GDP Growth*

c. *Predictors: (Constant), the Labor force (% growth), Gross capital formation (% growth), Inflation, consumer prices (annual %), New businesses registered (% GROWTH)*

However, when assessing the individual impact of each of the 4 variables, the coefficient in table 6 below indicates that the entrepreneurial activity shows an insignificant impact when all of the 3 control variables are included in this model, despite the positive significant relationship found in the correlation analysis. Hence, in order to be sure about the results, the researcher has performed another regression analysis entering only inflation as the control variable in the next model.

Table 6. Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-0.006	0.025		-0.222	0.825
	New businesses registered (% GROWTH)	0.041	0.065	0.076	0.632	0.530
	Gross capital formation (% growth)	0.253	0.059	0.482	4.313	0.000
	Inflation, consumer prices (annual %)	0.008	0.005	0.191	1.757	0.084
	Labor force (% growth)	0.041	0.441	0.011	0.093	0.927

a. Dependent Variable: GDP Growth

Table 7 shows that the results from the same indicate that the fitted regression model is significant at 0.05 significant level and data provides sufficient evidence to conclude 11.4% impact of the independent variables on the dependent variables.

Table 7. Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
2	.338[a]	0.114	0.085	0.11682

a. Predictors: (Constant), Inflation, consumer prices (annual %), New businesses registered (% GROWTH)

Table 8 shows that the individual impact of both inflation and entrepreneurial activities is observed to be positively influencing the overall economic growth of the region. The beta coefficient of the EA reflects that a 100% increase in the number of new businesses in the countries will enhance the GDP of the countries in the Middle East by 11.2%. In addition to this, inflation only reflects 1% influence on the economic growth of the region. The results from both the beta coefficients are indicating significant results at a 0.10 level of significance. The aforementioned results are found to be aligned with the results of Van Stel, Carree & Thurik, (2005), which has identified that the impact of the entrepreneurial activity on the economic growth remained significantly positive for rich countries.

Table 8. Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
2	(Constant)	-0.006	0.021		-0.299	0.766
	New businesses registered (% GROWTH)	0.112	0.066	0.208	1.700	0.094
	Inflation, consumer prices (annual %)	0.010	0.005	0.232	1.897	0.063

a. Dependent Variable: GDP Growth

Conclusion

Since there are limited studies found which tested the impact of entrepreneurship on the economic growth in the context of the Middle East. Hence, for the current research, the study analyzed GDP, GCF, Labor force, Inflation rate and Entrepreneurial activities registered for the period of 8 years starting from 2009 to 2016, particularly of the 8 Middle Eastern countries.

The descriptive results reflect that Jordan tends to have the highest economic growth average with 6% EA growth. The study also critically presented a significant positive relationship between the entrepreneurial activities in the Middle East and its overall economic growth. The current findings suggest that there lies a positive relationship between the two variables. Moreover, the economic growth of the region has indicated to have a weak yet significant influence of the entrepreneurial activities, inflation rate, and gross capital formation. In other words, our analysis reflects that new firms play a crucial role in benefiting from the externalities in the region, and hence the rise in entrepreneurship may result in a huge contribution to the economic growth.

Based on these findings, the countries in the Middle East are suggested to focus more on increasing the entrepreneurial activities as this will not only help in increasing the employment rate but also help in raising the overall growth of its economy.

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IMPORTANCE OF THE PROCESS OF TEACHING THE BASICS OF SOCIAL ENTREPRENEURSHIP FOR THE SUSTAINABLE DEVELOPMENT OF SOCIETY

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Abstract. Self-realization in the professional sphere is one of the most important areas of human activity. In the conditions of socio-economic crisis, the transition to market relations and strengthening of social stratification, it is important to involve business in solving major social problems. The paper substantiates the importance of the process of teaching unemployed women the basics of social entrepreneurship for their self-realization in this direction. Recommendations are presented on social entrepreneurship education, aimed primarily at unemployed women, creating a positive image of an entrepreneur organizing a socially oriented enterprise, and providing educational support to social entrepreneurs. An educational course "Social Entrepreneurship" has been developed, which can be implemented by regional employment services and non-governmental agencies to promote employment and self-realization of unemployed women.

Keywords: unemployed; education; unemployed women; social entrepreneurship; professional self-realization

1. Introduction

The labor market and employment of Russian women in recent decades have undergone major changes. Women's unemployment in Russia is qualitatively different from unemployment in developed Western countries. The

principal difference is that in the West, unemployment is an immanent phenomenon typical of the development of capitalist relations over several centuries. Accordingly, social protection policies for various groups of the unemployed, return of the released labor resources, and social adaptation to the conditions of employment have been developed and tested by life.

Russians, on the other hand, are faced with unemployment in a sharp, acute form after many decades of the guaranteed right to work and overall employment. Therefore, in Russia and in the West, the social and socio-psychological consequences of unemployment are fundamentally different in scale and strength. This is achieved by mass social depression, loss of confidence in the future. The long, stable impoverishment of the bulk of the population has led, in particular, to social discrimination against women and their discrimination in the field of work (Bekebayeva et al., 2019; Singareddy et al., 2019; Rahman and Bobkova, 2017a, b).

The problem of self-realization in the professional activity of an individual at the present stage of development of Russian society has become particularly acute. The problems of personal self-realization in social entrepreneurship are increasingly attracting the attention of researchers all over the world, which is determined by the importance of self-realization as a cultural component of human behavior in society and increased capabilities of science that can solve problems of high complexity (Dees, 1998; Harding, 2004; Koroles & Berman, 2006; Alter, 2007; Dacin et al., 2010; Maksimova, 2015; Mauch & Tarman, 2016; Kazieva, 2017).

According to foreign scholars, a social institution is a form of standardized expectations that govern individual behavior and social relationships (Bowles & Gintis, 2002; Austin, 2006; Dorado, 2006; Miller & Wesley, 2010; Hibbert et al., 2005; Dart, 2004; Trofimova et al., 2019). Social entrepreneurship can be considered as the most important state institution that performs an auxiliary function, helping the state to ensure the stable operation of society and certain social groups, in particular, unemployed women.

2. Methodology

The methodological basis of the study was the institutional approach. To solve research problems, theoretical research methods were used, in particular: interdisciplinary analysis, studying the theoretical state and degree of problem development, identifying the problem and its solutions, identifying key concepts reflecting the content of the issues under consideration, constructing theoretical concepts based on logical reasoning as mediated by the authors' professional experience.

The purpose of the paper is to substantiate the significance of the process of teaching unemployed women the basics of social entrepreneurship for their self-realization and development of social projects. As empirical research methods, the authors used the data of a sociological survey, statistics, and study of pedagogical experience. These methods allowed finding out the relationship between the process of education in the field of social entrepreneurship for unemployed women and the degree of their self-realization in professional activities.

3. Results and Discussion

Significance of the study

The significance of social entrepreneurship is that in today's socio-economic and political conditions, society requires a conscious and responsible approach to solving social problems from business entities, a developed sense of civic responsibility for vulnerable social groups and communities. Businesses should be involved in the activities of the institution of patronage and philanthropy in order to achieve social justice for other social groups and society as a whole. Currently, entrepreneurship is one of the most important social institutions that can assist government agencies in solving social problems through the development of urban and regional infrastructure,

environmentally friendly activities, and work with socially vulnerable and low-income groups of the population. Consequently, recently this topic has become increasingly relevant both among domestic and foreign authors.
As a rule, it is women who often face difficulties both in finding a job and in the process of self-realization in professional activities. There are certain stereotypes about the inability of women to combine successful professional activities with a successful marriage and a full-fledged family. At the same time, most modern women want to be professionally successful, and unemployment negatively affects their mental and emotional state (Akhinov & Rvachev, 2016; Hockers, 2006; Kuznetsova et al., 2019; Vasilev et al., 2018).

It is worth noting that many unemployed women could successfully realize their creative and productive potential in the emerging sphere of social entrepreneurship. The institution of social entrepreneurship addresses the most important needs by providing mutual assistance between members of the community. The development of the principles of social entrepreneurship is beneficial to the state, society, and business.

Today, the problem of employment of the working population primarily concerns women. Today, 33.9 million women work in Russia, or 48% of all workers. The demographic situation is such that the number of able-bodied women will gradually increase. Moreover, today, among the total number of all officially registered unemployed, the share of women is about 69% (Moskovskaya, 2015).

More than 77 million women live in the Russian Federation, which is approximately 53% of the country's total population. The main reason for separating women into a specific social group that needs more social support is related to the ability of women to bear children, which is the basis for the viability of a particular society. At the same time, the generative capacity of women is the main cause of difficulties arising in the field of employment. Marriage and birth of children force women to interrupt production activities for some time.

Social entrepreneurship is an important economic activity that challenges the basic principles of economy. Thus, social entrepreneurship contributes to the active involvement of unemployed women in economic life. The self-realization of unemployed women is possible only through full participation in community's life, when people get the power and resources to work together to improve their lives, strengthen their families and contribute to the development of society (Goloshchapova et al., 2018; Plaskova et al., 2017; Kovaltchuk et al., 2016; Tarman and Chigisheva, 2017; Prodanova et al., 2019).

The ideas of social entrepreneurship have recently become increasingly relevant. Using market-based methods to solve social problems, social entrepreneurship identifies two tasks: the creation of both social and economic values. Social enterprises seek to create value for customers; it is a concern for others that makes social entrepreneurship an important and significant direction.

Features of social entrepreneurship
The most important features of social entrepreneurship should be highlighted:
- ➢ social entrepreneurship is a kind of balance between the social values and the economic component. Such interaction creates social and economic values, which distinguishes social entrepreneurship from traditional forms of business and from charity organizations;
- ➢ social entrepreneurship arises in certain conditions, where traditional markets have failed, or where there is an institutional vacuum. A social entrepreneur should evaluate not only the risks associated with the development of a new type of activity but also the risks associated with the formation of new institutions that can support this type of business;
- ➢ social entrepreneurship attracts unemployed women, mothers of many children and disabled people to work.

Organizations related by their function to the sphere of social entrepreneurship are seen as the main goal not only in the accumulation of capital but also in solving social problems in accordance with accepted norms, values, and rules. Social entrepreneurship performs the following functions in society:
1) ensuring the processes of social solidarity and social justice;
2) promotion of social equality, which leads to the development of social integration and order in society;
3) attracting young people to solving social problems;
4) creating an informed and open society based on ethical standards and resistant to xenophobia;
5) development of social integration.
Table 1 presents the main areas and areas of activity of social entrepreneurs in Russia in 2018.

Table 1. Fields of activity of social entrepreneurs in Russia, 2018 (Federal Portal for Small and Medium-Sized Businesses, 2019)

Rating of spheres of activity	Direction of social entrepreneurship	Share in the total volume of activities in social entrepreneurship, %
1	Projects in the field of education and children's leisure	41
2	Employment of people in difficult life situations	16
3	Improving the quality of life of vulnerable social groups	7
4	Improving the quality and accessibility of the quality of medical services	7
5	Making socially significant products	6
7	Development of agriculture in remote regions	5
8	Tourist and recreational services for vulnerable social groups	5
9	Ecology projects	4
10	Preservation and revival of the cultural and historical heritage of Russia	3
11	Provision of public geriatric services	3
12	Organization of affordable sports and recreational leisure	3

The main types of the functioning of a socially oriented business are the production of goods and the provision of socially significant works and services. Currently, the most relevant are the following areas of social entrepreneurship:
- Ecological business. Activities aimed at improving the environmental situation.
- Organization of employment for persons with disabilities.
- Organization of children's development and leisure (organization of children's events, creation of training groups, clubs, etc.).
- Organization of healthy and healthy leisure activities (cleaning and gardening of territories, making children's and sports grounds, organization of holidays, cultural events).
- Rehabilitation of citizens after traumatic situations.

Government agencies should develop a concept for the phased development of social entrepreneurship. To implement this concept, the following is needed:
1. campaigning in the media for the participation of entrepreneurs in charity events (Internet, television, radio), broadcasting information about tax incentives, training, counseling and other forms of state support for social entrepreneurs;
2. creation of the positive image of a social entrepreneur as an organizer of a socially oriented organization.
3. provision of legal support to social entrepreneurs;
4. development of a system of economic support for social entrepreneurship;
5. educational and informational support of social entrepreneurship organizations.

Educational aspect of social entrepreneurship
The educational component of social entrepreneurship for the target audience – unemployed women – can be represented by organizing meetings of future social entrepreneurs with regional authorities on cooperation,

opening research centers and incubators, holding master classes to share the experience. Social entrepreneurship needs people with an active lifestyle, opinion leaders who can both generate and implement relevant, socially-oriented business ideas.

During the research, it was revealed that:
- psychological personality traits (communicative, emotional, and others) of a professionally successful woman are specific and differ markedly from the psychological traits of an unemployed woman's personality.
- unemployed women have qualities that often impede successful self-realization in traditional business sectors.
- unemployed women can be successful in social entrepreneurship, since women have naturally developed empathy for people, and the ability to empathize is very important for the successful development of a socially oriented business.

The difficulties of self-realization of women are different because of the transient nature and mainly the solvability of the obstacles that arise. Unlike intractable difficulties, solvable difficulties can sometimes even contribute to successful self-realization, bringing the process of self-realization of unemployed women to a new level (Korableva et al., 2019a, b; Lafer and Tarman, 2019; Yiğit and Tarman, 2013).

Self-realization of unemployed women
Special educational programs can help unemployed women to overcome difficulties in self-realization. Vocational training for the unemployed is a scientifically based system of measures that includes three options for additional vocational education: vocational training, retraining, and advanced training carried out by sending employment services to increase the competitiveness of the unemployed in the labor market, overcome socioeconomic, situational and other types of maladjustment caused by job loss.

The problem of women's self-realization relates to socio-psychological and social problems of modern society. The study of theoretical material on this topic has shown that there are a number of problems affecting the effectiveness of the use of vocational education as a tool to reduce unemployment among women.

The existing difficulties of the educational process focused on unemployed women include a small number of areas of vocational training, retraining, and formation of new competencies (Prodanova et al., 2017; Dunets et al., 2019; Goryushkina et al., 2018; Mueller et al., 2019; Kovalenko et al., 2018a, b). The set of proposed specialties is formed taking into account the existing demand in the labor market and the organizational capacity of employment centers. The most common offers are jobs, but for unemployed people with higher education (mostly women), such options do not seem attractive.

The next important task is to duly fix the content of the curriculum correctly, taking into account the brevity of training (from 4 weeks to 8 months). The limited time and the compactness of the learning conditions give rise to a rigorous selection, a clear structuredness of the material presented, and a high concentration of its presentation. As a rule, training implies the presence of certain knowledge, skills and competencies of students. As a result, the following problem arises – the low level of readiness for the upcoming training in unemployed women reduces the productivity of this learning process (Pavlyuk et al., 2018; Yemelyanov et al., 2019; Bozhkova et al., 2019).
As a result, employment service specialists often face the following typical situations:
1) unemployed women who applied to the employment service are prone to passive assistance measures, which are often ineffective in their choice (the job search time is slow, proposed vacancies do not meet expectations, etc.);
2) having chosen the initiative strategy of her development, an unemployed woman begins vocational training, but does not complete it;
3) an unemployed woman does a training program, but is experiencing difficulties with the further practical application of the obtained new competencies.

The third situation examined demonstrates the mechanism of manifestation of "secondary" unemployment in the labor market. Secondary unemployment includes job seekers, retrained, but not working, not found a job, not employed in the labor market.

The situation related to secondary unemployment, in the authors' opinion, is one of the proofs that low motivation to master educational programs, difficulties in mastering new social roles can, on the one hand, increase the negative feelings of an unemployed woman associated with her attempts to overcome unemployment, and, on the other hand, strengthen the social and economic losses of the state (Rih, 1996; Defourny, 2012; Khalikov et al., 2018).

In this regard, the authors consider it important to expand the boundaries of the psychological and pedagogical component of the employment agencies, including psychological and pedagogical support for unemployed women, increasing the share of their participation in training programs in the areas of social entrepreneurship.
The organization of the educational process should take into account both the general characteristics of all unemployed women (experiencing personal crisis, complex manifestation of social maladjustment associated with job loss or its prolonged absence) and their differences due to socio-demographic characteristics (age, professional experience, type of nervous activities, etc.).

The effectiveness of training unemployed women in the basics of social entrepreneurship is closely linked to overcoming the psycho-physiological, socio-psychological, psychological, educational, and socio-economic barriers that impede the learning process (Shatunova et al., 2019). The elimination of these barriers will require preliminary targeted preparation of unemployed women for vocational training and the study of new material, and in the process of training they also need to be provided additional assistance.

Today, professional counseling and psychological assistance from employment agencies often occurs without taking into account the specific needs of unemployed women when choosing a strategic professional career.
To solve these problems, it is necessary to implement the following activities:
- introduction of socio-psychological recommendations for managers, teachers, and psychologists, contributing to the necessary changes in their own system of attitudes, beliefs, and expectations regarding different genders, as well as in the system of relationships and interactions with different genders in society;
- development and implementation of programs of social and psychological correction for girls and women, which help to adequately assess themselves and make informed life choices in their profession and personal life.
The state policy in the professional and employment spheres provides a set of measures aimed at enhancing the role of women in public life, stimulating their professional activities, as well as creating the conditions for combining career with family responsibilities.

At the same time, important areas of activity here are training and retraining of personnel, creation of new jobs and development of a system of social and socially significant works that allow taking into account the gender aspect. Today, the employment of unemployed women is developing in the food, processing and light industries, networks of organizations for the provision of social services, new jobs being created in the sphere of social services, that is, to a large extent in the sphere of social entrepreneurship.

When employing vulnerable groups of unemployed citizens, especially single and large family women raising minor children, children with disabilities, the authors suggest applying the practice of quoting jobs.
However, the most effective measure to mitigate the social consequences of unemployment and increase self-realization is the vocational training of unemployed women in obtaining the necessary knowledge and competencies in the field of social entrepreneurship. After training, the level of employment and self-realization of women increases significantly.

In the process of studying the possibilities of forming social entrepreneurship among unemployed women, the implementation of training programs on the basics of social entrepreneurship involving regional and city employment agencies is proposed.

The educational program "Social Entrepreneurship" consists of the following units:
1) Introduction to social entrepreneurship;
2) Identification and evaluation of social opportunities;
3) Legal regulation of social entrepreneurship;
4) Dynamic business models;
5) Marketing research of the social products and services market;
6) Search for investment for the development of social enterprises;
7) Opening and registration of social enterprises;
8) Strategy of social development of the enterprises;
9) Measuring the social impact of enterprises;
10) Basics of accounting;
11) Business and financial management of social enterprises;
10) Business ethics and communication.
Classes for each unit are held during one day and can be held not only in the on-site mode. For those who cannot attend classes, classes can be held online in the form of webinars (Kudinov et al., 2018).
Social entrepreneurship education programs for unemployed women should pay attention to studying the characteristics of social entrepreneurship both in general and in individual components of this activity, in particular, the ability to communicate, present their projects, interact with representatives of the business community and government officials, and fundraise.

Conclusion

The proposals will contribute to the study of the problems of self-realization of unemployed women in social entrepreneurship by obtaining the necessary education and the formation of new professional competencies. The practical application of this work may be associated with the creation of new training programs implemented by employment agencies, as well as psychological assistance to unemployed women in terms of their self-realization in professional activities.

Self-realization of unemployed women in their professional activities is a continuous process; at certain periods of life, the psychological characteristics of a person influence self-realization in the profession; at other times, self-realization in professional activities affects psychological characteristics, that is, it has a dual relationship.

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LABOR PRODUCTIVITY AND ITS ROLE IN THE SUSTAINABLE DEVELOPMENT OF ECONOMY: ON THE EXAMPLE OF A REGION

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Abstract. In this article theoretical aspects of labor productivity and its roles in the stable development of economy are studied. The main purposes of providing the growth of labor productivity as the basis of sustainable economical development are viewed. The relevance of elaboration of a concept of sustainable development of labor is explored. The indicators of the current level of indicators of labor productivity in the regional context and in industries are analyzed. The main problems are identified, the solution of which makes it possible to implement the National project of Labor Productivity and employment support of the Russian Federation. Sustainable economic development is associated not only with the progress of the information technology and innovation industry, but also with the improvement of the labor market where new jobs, professions and personnel are created. In this regard, the relevance of diagnosing labor productivity in the regional aspect is due to the fact that this indicator reflects the effectiveness of the national and regional economies, the production efficiency, characterizes the use of living labor in the production process and ultimately determines the standards of living of the population. In this regard, increasing labor productivity is one of those national goals that are being addressed not only at the federal, but also at a regional level. The higher labor productivity is, the higher economic growth, the level of protection of the national economy from external challenges and threats from the instability of world markets are.

Keywords: labor productivity, sustainable development, region, national project, economic growth.

1. Introduction

Throughout the Soviet history, the government has repeatedly set the goal of achieving a significant increase in productivity. The last of these attempts relates to the period of restructing called perestroika. In the post-Soviet period in 2008 at a meeting of the State Council when considering the Concept for the development of the country until 2020, based on the results of the previous years, the goal to achieve at least a four-fold increase in labor productivity over 12 years was also proclaimed as the need for the main sectors of economy which corresponds to the average annual growth rate of 12,2%.

If the data given by the Organization for Economic Cooperation and Development for 2015 is true, labor productivity in Russia is lower than in Poland and Latvia. The problem is obvious and there is a need to solve it. It is desirable to make a decision not in favor of the employers, although it is clear that in modern class societies the results of the growth of labor productivity are assigned for the purpose of personal enrichment of people who are scarcely employees (Plaskova et al., 2017).

Meanwhile increasing labor productivity is not only an economic process (Korableva et al., 2019; Thalassinos et al., 2011; Sharafutdinov et al., 2018). It gives a powerful impetus to social development. The essence of increasing labor productivity is that it reduces the amount of time that a worker needs to produce a certain amount of product or service in order to earn his living. And since production time is reduced, he has the leisure that is necessary for the development in other spheres of life: spiritual and cultural life, sports, self-education, the development of his own children or self-development, knowledge of the world at last (Masood et al., 2019; Shatunova et al., 2019; Tarman, 2016; Kuznetsova et al., 2019).

Steady growth of labor productivity is the economic law of sustainable economic development. Increasing labor productivity is the most important condition for the growth and improvement of production. An increase in labor productivity means reducing the working time necessary for the production of a product.

2. Methodology

At the beginning of 2019 the passport of the national project "Labor Productivity and Employment Support" was published, which occupies a special place among other documents defining the strategic tasks for the national economy. The importance that is attached to it is also reflected in the fact that among the indicators of assessing the performance of governors established by the Decree of the President of the Russian Federation, labor productivity growth is represented.

In recent years labor productivity in Russia has been growing, but it's still several times lower than in developed countries. OECD statistics show that in 2017 it was $26,5 (this is the volume of GDP produced by each working Russian citizen for one hour of work). The average is $54,8, and Russia is inferior to all OECD countries except Mexico (Kosyakova L. N., Popova, A. L., 2017). In terms of labor productivity Russia lags significantly behind developed countries as well as the BRIC countries.

The head of the Accounts Chamber of the Russian Federation A.L. Kudrin believes that in terms of labor productivity Russia lags significantly behind the United States of America, other economically developed countries of the West, and even Turkey. According to his estimates, the output per worker in Russia is approximately $23 per hour. In Turkey this indicator is 1,5 times more and in the United States it is about 3. He suggests that in terms of labor productivity Russia is at the level of the 1980s for the countries of the so-called "Group of Seven" (Fukalova, 2018).

In the ranking on the level of labor productivity in 2017 including 36 of the world's largest economies and compiled by Market Watch analysts, Russia lost two positions compared to 2016, as it moved from the 32nd place to the 34th one losing to Chile and Poland (*Yagodin, 2017; www.rbc.ru*).

The aim of the study is to determine the role of labor productivity in the sustainable development of regional economy as well as to identify the distinctive features and development factors that inhibit growth.
General scientific and special methods are used as the methodological basis of the study.

The methods of analysis and diagnosis were used throughout the whole study, especially they were necessary for studying the regional characteristics of the dynamics of the labor productivity index, which allowed us to identify the general tendency to maintain positive indicators in most regions of the Russian Federation.

The comparative method was used to study the current situation. The factor method was used to identify the main causes of stagnation and decrease in the labor productivity index (Korableva et al., 2019; Solas and Sutton, 2018; Grima et al., 2017; Petrenko et al., 2019; Shaitura et al., 2018; Goloshchapova et al., 2018; Trofimova et al., 2019).

The results of the study were obtained by using the data from the Federal State Statistics Service of the Russian Federation, the Ministry of Economic Development of the Russian Federation, the Analytical Center of the Government of the Russian Federation, and the Russian media holding RBC.

The dynamics of changes in the whole of the Russian Federation

The Federal State Statistics Service of the Russian Federation does not provide any information on the indicator of "The Level of labor productivity" by regions of the Federation. There are publicly available labor productivity indices published annually both in the economy of the country and in the regions. It is calculated as the quotient of dividing the indices of the physical volume of GDP and total labor cost changes.

The analysis of the data available for the public access indicates a negative trend: the labor productivity index in the Russian Federation decreased throughout the country from 104.8% in 2008 to 101.9% in 2017. This is an unfavorable trend in terms of sustainability of economic growth, as well as of the competitiveness of the economy.

The Ministry of Economic Development of the Russian Federation forecasts a decrease in the growth rate of labor productivity in 2019 to 1.2%. Acceleration will begin only in 2020, when productivity will grow by 1.8% in annual terms. The indicator will have reached 3.1% by 2022 and it will remain at approximately the same level until 2024 (the forecast prepared for six years). But this effect in the forecast is still not fully taken into account. The contribution of the project "Increasing of labor productivity and employment support" will be evaluated in 2019. At present, the program's contribution to increasing productivity is estimated at 0.1 percentage points in 2019 "(www.rbc.ru).

In this regard, the analysis of regional aspects of the problem is preceded by valuating of the situation in dynamics. For more than 10 years, in addition to the post-crisis years of 2009 and 2015, there has been a positive dynamics of the index, but the growth rate has been declining. The average growth rate over 14 years was 3.21%. The general growth of labor productivity in different years was formed due to the growth of labor productivity in various industries. Thus, in 2017 the following economic activities made the main contribution: "Professional, scientific and technical activities" (108.4%), "Agriculture, forestry, hunting" (105.9%), "Hotels and catering enterprises" (103.5%). At the same time, back in 2016, the top three sectors were "Administrative Activities and

Related Additional Services", "Agriculture", "Forestry", "Hunting", "Manufacturing" with indicators of 103.9%, 103.0%, and 102.4%, respectively.

Until July, 2016 the old OKVED classifier was used. In this regard, it is difficult to compare time series for the sections of the classifier of types of economic activity in 2015-2017 with earlier periods. According to Federal State Statistic Service, the time series starting in 2011 in a unified methodology for OKVED-2 will be published in April, 2020 (Leaders of Russian regions in labor productivity 2018).

During 2003-2014, there was no definite leading industry in terms of labor productivity index. On average, for the study period, the highest value of the indicator was observed for the following industries: "Manufacturing" (105.2%), "Real estate operations, rental and provision of services" (104.6%), "Wholesale and retail trade; repair of motor vehicles, motorcycles, household goods and personal items "(104.1%). The lowest growth rates of the labor productivity index in 2003-2014 were observed in the field of fishing and fish farming (an average of 99.7% for the entire period under review).

In general, for 2003-2017, the value of the indicator was critically low (less than 100%) only in 2009 and 2015. A significant decrease in labor productivity in 2009 was a result of the global financial crisis, which led to a sharp decrease in production indicators, a decrease in the volume of output in the sectors of the economy, and a decrease in GVA. A similar situation was observed in 2015 during the economic crisis in Russia. Both industries that produce goods and industries that provide services were equally vulnerable (Singareddy et al., 2019; Bekebayeva et al., 2019).

3. Results

The positive factors of the Russian economy are the growth of GRP per capita and the containment of unemployment, which is at the level of 5%. The range in federal regions is from 3.2% in the Central Federal Region to 11% in the North Caucasus Federal Region.

The labor productivity index is significantly differentiated by the regions of the Russian Federation. In 2017, 69 regions (81% of the total number of regions) maintained a positive growth rate of the labor productivity index. The growth rate of at least 10% was demonstrated by the Jewish Autonomous Region (113.5%), Astrakhan Region (110%). The largest drop in the indicator was observed in the Republic of Ingushetia (labor productivity decreased by 5.7%), Chechen Republic (-4%), Sakhalin Region (4%). At the same time, a negative trend has been observed in the Republic of Ingushetia since 2015.

On the whole, in the Russian Federation, the labor productivity index is below 100% compared to the previous year in 16 regions (Table 1), which can conditionally be attributed to lagging regions. This conditionality is associated with the absence of absolute values of the analyzed indicators and a relatively small deviation from the level of indicators in Russia.

At the beginning of 2019, Nizhny Novgorod, Tyumen Regions, Perm Territory and the Republic of Tatarstan became the leaders in the implementation of the national project "Labor productivity and employment support". These regions have entered the most contracts with enterprises. Some of them have more than 40 agreements with the enterprises that participate in the project. More than 950 enterprises are going to enter the project by the end of the year.

Table 1. Regions with low labor productivity index (LPI)

Regions	LPI	Regions	LPI

Komi Republic	99,6	Amur Region	97,8
Altai Republic	99,5	Ivanovo Region	97,3
Kabardino-Balkarian Republic	99,5	The Republic of North Ossetia	97,0
The Republic of Sakha (Yakutia)	99,4	Chukotka Autonomus Region	96,5
Ryazan Region	99,3	Khanty-Mansiysk Autonomus Region	96,2
Nenets Autonomic Region	99,2	Sakhalin Region	96,0
Sevastopol	98,3	Chechen Republic	96,0
Tomsk Region	97,9	The Republic of Ingushetia	94,3

Source: compiled by the authors

At present, there is a clear idea of the factors and the reasons that influence the level and the dynamics of labor productivity in the Russian economy, including those that predetermine the lag of the country in this indicator from economically developed countries (Akhmetshin et al., 2018; Sharafutdinov et al., 2017).

The identification of the causes of regional differentiation of the labor productivity index and the dynamics of its changes suggests the need for factor analysis.

The labor productivity index is characterized by high variability and dynamism, which is associated with the influence of many factors on it. Factors of changes in labor productivity are the reasons for the change in its level. They are classified into the following groups:

1. Material and technical factors (automation and mechanization of production processes, raw materials used, their quality, properties);

2. Organizational factor (improving the management of the enterprise, production and labor);

3. Regional economic factors (climatic conditions, their changes, trends of macroeconomic indicators of the regions) and economic and geographical factors (availability of free labor resources, electricity, water; terrain);

4. Social factors (skill level of personnel, reduction of monotonous, harmful and hard work);

5. Structural factors (changes in the volume and structure of production, economic specialization).

The factors of regional differentiation affecting labor productivity can be systematized according to the time interval of occurrence and the consequences for the economy:

Historically developed factors:

Ineffective sectoral structure of the economies of the constituent parts of the Russian Federation. Thus, in the economy of the Republic of Ingushetia, the Chechen Republic, and North Ossetia, agriculture (its share in GRP is 10%, 4% is in the Russian Federation), trade and construction prevail. The agricultural economy is accompanied by a high unemployment rate compared to the Russian Federation, that is 27%, 14% and 12%, respectively.

Another example of the influence of the sectoral structure of the regional economy on labor productivity is the situation in regions with developed mining industries. Thus, in the structure of gross value added (GVA) of the Khanty-Mansiysk Autonomous Region, Sakhalin Region and the Chukotka Autonomous Region, which are

characterized annually by a low labor productivity index, a high share of the mining sector is distinguished. In these regions, it is 67%, 60% and 43.5%, respectively. However, in these regions the unemployment rate practically does not exceed the value for the Russian Federation as a whole. The main reason lies in the reduction of industrial production, investment in fixed assets, as it is shown by the data in Table 2.

Table 2. The dynamics of industrial production indices in areas of economic activity and the index of physical amount of investments into fixed assets in commodity outsider regions in labor productivity, in percentage

Regions of the RF	Industrial production index				Index of physical amount of investment into fixed assets	
	Mining industry		Manufacturing industries			
	2015	2017	2015	2017	2015	2017
Khanty-Mansi Autonomous Region	97,1	99,6	101,3	97,0	93,6	113,8
Sakhalin Region	114,0	99,2	90,0	111,6	95,6	117,3
Chukotka Autonomous Region	104,1	86,0	85,2	99,9	156,2	94,0

Source: compiled by the authors

Thus, a unipolar structure of the economy has formed in the regions that are outsiders by the labor productivity index: either the agricultural sector or the extractive industries predominate. The agricultural economy contributes to the formation of high unemployment. Mining economy significantly reduces the possibility of growth in labor productivity due to the decrease in GRP growth rates and the use of low-skilled labor. Nevertheless, state support is of great importance, expressed, in particular, in investing in the economies of these regions (Prodanova et al., 2019a, b; Neizvestnaya et al., 2018; Yemelyanov et al., 2019).

Labor productivity in the Russian region differs significantly. Its growth rates are the highest in the regions where new industries have been built in recent years and old enterprises have been modernized. One can distinguish regions with the so-called "low base effect" as for example, in Jewish Autonomous Region (113.5%).

The number of leading regions where the level of labor productivity exceeds the national average is 45. Not long ago (5-6 years), it could be argued that all the leading regions are producing raw materials, extracting hydrocarbons. Nowadays the situation has changed due to the fact that they have lost their competitiveness. Thus, the labor productivity index in Khanty-Mansi Autonomous Region is 96%, in the Nenets Autonomous Region it's 99%.

Nevertheless, there are large Russian regions with export specialization among them, most of them are characterized by a high share of mining industries (Sakhalin and Astrakhan regions).
Among non-resource regions, the Republic of Bashkortostan, Perm Territory, Kaluga Region, Tula Region, and Leningrad Region, Saratov Region, Irkutsk Region, Primorsky Territory are the leaders in terms of productivity index.

The study showed that the sectoral structure of production greatly affects the level of labor productivity.

The state of the material and technical base of industries does not meet modern requirements. The highest depreciation values of fixed assets in the sphere of mining in Russia are in regions with a developed mining industry (lagging behind in the labor productivity index). The highest depreciation of fixed assets in the Khanty-Mansiysk Autonomous Region is more than 69%. It's 53% in the Sakhalin Region, 52% is in the Chukotka Autonomous Region. On the whole, depreciation in the mining industries is 56.4% in the Russian Federation.

In the agrarian economies of the Republic of the North Caucasus, the degree of depreciation of equipment also exceeds average Russian values. The indicators in agriculture that is the main industry reach 66% in the Republic of North Ossetia (Alania), 43% in the Chechen Republic, 48% in the Republic of Ingushetia. Across the Russian Federation, depreciation of fixed assets in agriculture is 40%.

Investments have a significant impact on the modernization of fixed assets. In the Chechen Republic the share of investments in fixed assets used in agriculture is 11.6%. In the Republic of Ingushetia it's 2.3%, in the Republic of North Ossetia (Alania) it's only 0.04%.

The material and technical base of the economies of these republics is characterized by one of the lowest values for the cost of the equipment used. Among other constituent parts of the Russian Federation, outsider regions rank from 68th (the Chechen Republic) to 84th place (the Republic of Ingushetia) in terms of labor productivity index.

Availability of labor of the required qualifications; lack of qualified personnel. Among the regions of Russia, the republics of the North Caucasus stand out. The population employed in the economy is characterized by a high proportion of people with higher education (the maximum is 42% in the Republic of North Ossetia (Alania), the minimum is 26.7% in the Republic of Ingushetia. Approximately 40% of employees have secondary education. Moreover, in North Ossetia 35% of the unemployed have higher education, 46% have secondary vocational education.

This indicates the lack of demand in the labor market for workers with higher education and a shortage of workers. The North Caucasus is the region with the highest unemployment rate and labor force potential.
The people employed in the mining regions also mainly have higher education: 38% in Khanty-Mansi Autonomous Region, 31% in the Sakhalin Region, about 35% in the Chukotka Autonomous Region.
The share of the unemployed with secondary vocational education in the Khanty-Mansi Autonomous Region is more than 36%, the highest is 32%. In the Sakhalin Region it's about 39% and 17% respectively. In the Chukotka Autonomous Region it's 28% and 8.7%.

Modern factors: macroeconomic factors of economic development under the conditions of sanctions, the dominance of large and largest enterprises in the regions, insufficient business development, corruption, etc.
The development of small and medium-sized businesses in the regions is one of the factors notable for its insignificant role in the Russian economy. Thus, investment in fixed assets of small enterprises in the Chechen Republic in 2017 was only 7.1%, in the Republic of Ingushetia and North Ossetia it was less than 1%. In the number of small enterprises, the North Caucasus occupies the last place: 48 thousand, or 1.7% for the Russian Federation as a whole.

The presence of large companies whose products are known in the world market is of great importance. They are distinguished by high and stable turnover, relatively high wages and, as a consequence, high labor productivity. In 2015, the premium All-Russian project "Labor Productivity: Industry Leaders", organized by the Business Portal "Production Management", was launched. In 2018, the project results were published. In the process of compiling the rating, the specialists studied the data of more than 5,000 industrial enterprises in Russia, their total revenue amounted to more than 51% of Russia's GDP, the number of employees was more than 5.5 million people. Table 3 presents the companies included in the top ten leaders in labor productivity, which are situated in the leading regions.

Large companies have a positive effect on the investment climate of the regions, increase their level of economic security, but do not guarantee high rates of labor productivity (Sycheva et al., 2019). One of the reasons is their small number. So, in two of the ten regions represented, the labor productivity index does not reach 100%, despite the fact that they are based on large enterprises. These are the Sakhalin and Ryazan regions. The first one has a

single-industry economy, the second one is characterized by high depreciation of fixed assets (the 76th place in the Russian Federation), low amount of investment in fixed assets (61st place).

The dynamics of labor productivity depends on the growth rate of the economy and targeted efforts to increase production efficiency and introducing new technologies. Since September 2017, the Ministry of Economic Development of the Russian Federation has been implementing a project to increase labor productivity and support employment at the expense of internal reserves of enterprises.

According to the program passport, in 2018, special programs to improve business models and retrain employees are implemented in 150 enterprises in 15 regions. There are results when enterprises already participating in the program show tens of percent performance growth dynamics.

Table 3. Companies leading in labor productivity in 2018

Company	Productivity 2017, mln rubbles per person a year	Region of the RF	Labour productivity index according to Rosstat in 2017
Sakhalin Energy	139,44	Sakhalin Region	96,0
ANK Bashneft	81,29	The Republic of Bashkortostan	103,0
NOVATEK	71,6	Tyumen Region	102,0
Hyundai Motor Company	67,55	Saint Petersburg	100,4
LUKOIL Group	57,3	Moscow	101,6
Udmurtneft	54,56	Udmurt Republic	101,3
Logicruff Factory	44,56	Ryazan Region	99,3
Processing Plant "Abashevskaya"	34,98	Kemerovo Region	103,7
NLMK Kaluga	26,84	Kaluga Region	107,4
Boguchanskaya hydroelectric station	28,14	Krasnoyarsk Territory	103,1

Source: compiled by the authors

Labor productivity is low, as in recent years there has not been a sufficient increase in investment that could improve into productivity. The decrease in labor productivity growth in 2018 was due to the delayed launch of state investment projects, while the tax burden was growing (Fig. 1).

Increasing labor productivity as a condition for sustainable development of the regional economy

Resource usage

Systemic reproduction of resources
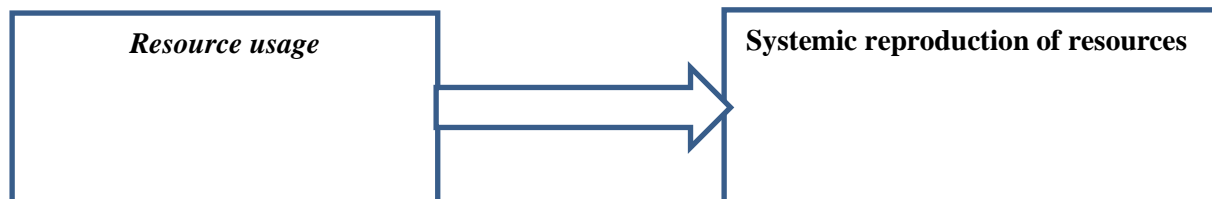
Fig. 1. The reproductive aspect of sustainable development of the region's economy.

Source: compiled by the authors

The growth of labor productivity is a matter of technology to a large extent, and under the conditions of sanctions, Russia's technological openness remains in question (Ivanov and Bukhval'd, 2019).
The reasons for low labor productivity in the regions are:

insufficient attention of the leaders of the regions of the Russian Federation to the problem of increasing labor productivity and the lack of appropriate practical actions;

low level of managerial and technological competencies among enterprise managers necessary for a qualitative leap in labor productivity;

underdeveloped financial mechanisms necessary for the implementation of projects to improve production efficiency;
high social risks of mass layoffs and ineffective mechanisms for the quick search for new jobs and retraining and advanced training of employees;

the lack and low productivity of human capital as a leading factor in the intellectual and economic development of the Russian Federation and its regions due to low investment in it (1.5-2 times lower than in the EEC) (*viperson.ru*).

4. Discussion

The first thing that comes to many minds when there's the question what should be done first to increase labor productivity is to urgently replace all equipment with modern high-performance one. But then doubts begin: where can companies get money for it? After all, they are pressured by the stagnation of the Russian economy, in Russia there is practically no production of machinery and machine tools, the ruble exchange rate is not favorable enough for large-scale imports (Rahman and Bobkova, 2017; Vasilev, 2019). This is a serious obstacle to the big league of efficient producers.

However, some experts doubt that business in Russia now should spend money on achieving the same performance indicators that are recorded in countries with developed economies. Foreign companies opening factories in Russia do not lay the most advanced technologies on them, because it is too expensive. A competitive level of labor productivity, taking into account the devaluation of the national currency and the cost of labor in Russia, may be lower than the performance of advanced countries and leading companies in industries (Mullins, 2019; Titova et al., 2019; Voronkova et al., 2019).

Actually, other experts strongly disagree with this position, believing that one should be absolutely guided by world highs. As soon as we lower the bar to which we must strive, we subconsciously lead the country to what is called the Latin American model. If you remember, after the war, Argentina was one of the most highly developed countries. It had a high level of both productivity and GDP. And then everything collapsed, because they stopped pushing themselves, considering the competition with the USA hopeless. Another thing is China: it has long had a system of standards for products and production processes with a focus on indicators of world industry leaders. Enterprises accept it voluntarily, but those that have not done so are not allowed to fulfill government orders. As a result, Chinese enterprises are becoming more competitive in the global market in many

ways, including labor productivity (according to the Free Economic Society, in 1991–2012 it grew by an average of 6.8% per year, and by 1.29% in Russia, and in recent years it has stagnated).

However, those who reduce the problems of increasing labor productivity solely to the lack of funds allocated for modernization, do not know that they should not rush to invest in fixed assets without looking around first: are there any cheaper ways to increase productivity here and now? Then the investment may be less burdensome for the business, and its effect will be greater.

Conclusion

High productivity is the foundation of sustained economic growth. We believe that the main reasons for low labor productivity are a low level of competition, a serious lag in technology, worn-out equipment and a lack of investment.

The country has created a lot of inefficient jobs. On the one hand, this can be an advantage, since unemployment is low, but on the other hand, a huge army of watchmen, security guards, managers who, in fact, produce nothing, but only get paid, negatively affect labor productivity indicators.

In addition, the country has poor automation of production. For example, according to the International Federation of Robotics, in South Korea for every 10 thousand employees employed in the manufacturing industry, there are 631 industrial robots, in Singapore they are 488. Germans have more than 300 robots for every 10 thousand employees, Danes have more than 200, Americans have almost 190. Russia's performance in this ranking is very weak. We have only 3 industrial robots for every 10 thousand people. This is even lower than in Indonesia and as much as in the Philippines.

We will have to work with all these problems in the coming years. According to the government decree of 2019, the following trends were approved as the main areas for work to increase labor productivity in Russia:
1. Promotion of investments for the modernization of production
2. Stimulating technological updates
3. Promoting the replacement of obsolete jobs
4. Development of conditions for the professional development of employees
5. Increasing labor mobility
6. The growth of labor productivity in state-owned companies
7. Increasing Employment in the Small Business Sector

We believe that these measures, taken together, will improve the situation with labor productivity evenly across the regions, and, therefore, will have a positive impact on the sustainable development of the country's economy as a whole.

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CONTROL IN THE HUMAN CAPITAL MANAGEMENT SYSTEM IN THE STRATEGY OF INNOVATIVE DEVELOPMENT OF A REGION

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Abstract. This research paper examines the control function and its importance in the processes of formation and development of human capital to ensure the innovative development of a region using the example of the Republic of Tatarstan. The authors have examined the main control mechanisms in the field of human capital training, as well as in the high-tech and innovative sectors of the economy of the Republic of Tatarstan, and they offer their own recommendations for its improvement. To conduct the study, statistical methods were used to collect and analyze data in order to identify the weaknesses and strengths in the system of monitoring the development of human capital. Based on the study, a model of innovative development of the Republic of Tatarstan, supplemented with control elements, was proposed in terms of providing it with human capital. The practical significance of the results obtained is to supplement the theoretical provisions of the control function in the system of state and regional management in the interests of innovative development.

Keywords: human capital management system; human capital of a region; control function; innovative development of a region; the Republic of Tatarstan; innovation development strategy; cluster approach; intellectual and innovative potential of a region

1. Introduction

Today, the Russian economy is affected by a huge number of global challenges of an internal and external nature related to the decline in industrial production, the growth of social inequality and the deterioration of the general social and economic situation in its regions (Nagimov et al., 2018). In the context of intensified globalisation processes and scientific and technological progress, the Russian economy in order to increase its competitive position in the world market must be primarily high-tech and innovative (Korableva et al., 2018; Mironov et al., 2018a). The matter is that currently in the developed countries of the world the growth of gross regional product thanks to innovative goods and services reaches 85% of the total gross regional product. This is due to the fact that about 90% of the entire intellectual and innovative potential of the world is concentrated in these countries, with over 80% of the high technology market being under their control. Revenue from this market exceeds $ 2.9 trillion per year and continues to grow, which is well above the extractive and energy sectors (Mironov et al., 2018a). Innovative technologies, as a rule, require a significant amount of investment, including in human capital, both at the state level and at the private entrepreneurial level (Danchikov et al., 2018; Plotnikov et al., 2019; Orynbassarova et al., 2019).

The effective innovative activity of a region largely depends on the proper use of human capital, since institutional development in any economic system is carried out under state control (Lebedeva et al., 2016; Kondrashova et al., 2015). At present, control as a management function is recognized as the determining component of the process in achieving high quality work not only of enterprises, but also of regional systems. Control is an information system, including the collection, processing, storage and transmission of management information (Gurieva et al., 2016). There is generally accepted logic: no control, no exact implementation of the plan, no high result of the enterprise. This statement is also true for a regional economic system (Mironov et al., 2018b; Korableva et al., 2019). Control, as an institution of economic security, allows us to evaluate the fulfillment of the tasks set, the achievement of the stated indicators and is effective only with correctly selected targets that the economic entity seeks to achieve (Akhmetshin & Vasilev, 2016; Rahim et al., 2017; Korableva et al., 2019). Human capital, like any other component of socio-economic development, requires clear timely monitoring. The main indicators of human capital in the framework of the innovative development of a region include both the indicators shaping it (the availability of higher education, the costs of educational and scientific activities), and the indicators characterizing its effectiveness - the share of innovative goods and services in the total volume of GRP, etc. The main task of managing human capital is the creation of favourable conditions, including motivation and retention of the labour potential of a region and the formation of an innovative type of thinking in all sectors of economics (Latyshev, 2015; Ibatova et al., 2018; Girdzijauskaite et al., 2019; Prodani et al., 2019; Orynbassarova et al., 2019; Bernardi, 2019).

Thus, the key element in the management of human capital to ensure innovation is control, which should be directly related to the general strategic concept of the region development (Brager et al., 2018).

2. Methodology

This scientific work was formed based on the following stages of scientific research:

1. The first stage consisted in studying theoretical provisions on control as a management function and showing its relationship with the human capital management system in the interests of the innovative development of regional economic systems.

2. The second stage was dedicated to analysing the economic development of the Republic of Tatarstan and studying the system of management and development of human capital. The innovation system of the region was studied in more detail and the mechanisms for monitoring these systems were examined. The study identified the

main problems associated with the formation of human capital in the interests of the innovative development of regional economic systems that had arisen due to the insufficient level of implementation of the control function.

3. The third stage presents the author's recommendations for improving the system of human capital formation in the strategy of innovative development.

The theoretical basis of the study was formed by the results of fundamental scientific works of leading domestic and foreign scientists whose research was devoted to the control functions in management, to human capital and human resource management, as well as studies on the relationship of human capital and innovative development (Vorobeva et al., 2016; Singareddy et al., 2019; Trofimova et al., 2019; Voronkova et al., 2019).

The methodological basis of the study is the dialectical method, a systematic approach to the analysis of the facts and phenomena under consideration. The study is based on the wide use of methods of analysis and synthesis, systematisation and complexity, comparative analysis, factor analysis, as well as methods of structural-functional, statistical analysis. The above methods were used in various combinations at different stages of the study, depending on the goals and tasks to be solved, which undoubtedly contributed to ensuring the reliability of the analysis and the validity of the conclusions made by the authors (Osadchy, 2015)

The empirical base used was the database of the Federal Service for Regional Statistics of the Republic of Tatarstan, the results of statistical and sociological studies, legal acts of the Republic of Tatarstan (Innovation Memorandum, Law on Innovation Activities, the Strategy for the Development of Human Capital until 2030), as well as materials from scientific seminars and scientific and practical conferences.

3. Data, analysis, and results

3.1. Problems of innovative development of the Republic of Tatarstan

The subject of the Russian Federation, the Republic of Tatarstan, was taken as the object under study in this work. The choice of this region is due to the fact that the Republic of Tatarstan is traditionally considered to be the oil-producing region of Russia, that is, depending on the raw material sector of the economy, which is inherent in many regions of the Russian Federation. For this very reason, the development of the innovation sector in the Republic of Tatarstan through the formation of competitive human capital is of great importance, since most of the region's tax revenues come from income tax from the oil and gas sector (Table 1), (Fig. 1).

Table 1: The structure of tax and non-tax revenues of the budget of the Republic of Tatarstan in the years 2014 to 2018, percentage

Revenue Type	Yearly Values				
	2014	2015	2016	2017	2018
Income tax	47%	41%	39%	37%	40%
Personal income tax	23%	26%	25%	30%	27%
Property tax	13%	16%	12%	14%	13%
Excise taxes	12%	14%	13%	13%	12%
Total Income Taxes	2%	2%	2%	3%	3%
Other tax revenues	2%	2%	3%	1%	3%
Non-tax revenues	2%	1%	6%	2%	2%

When considering the structure of income tax (Figure 1), it becomes obvious that almost half of this tax is formed by oil companies.
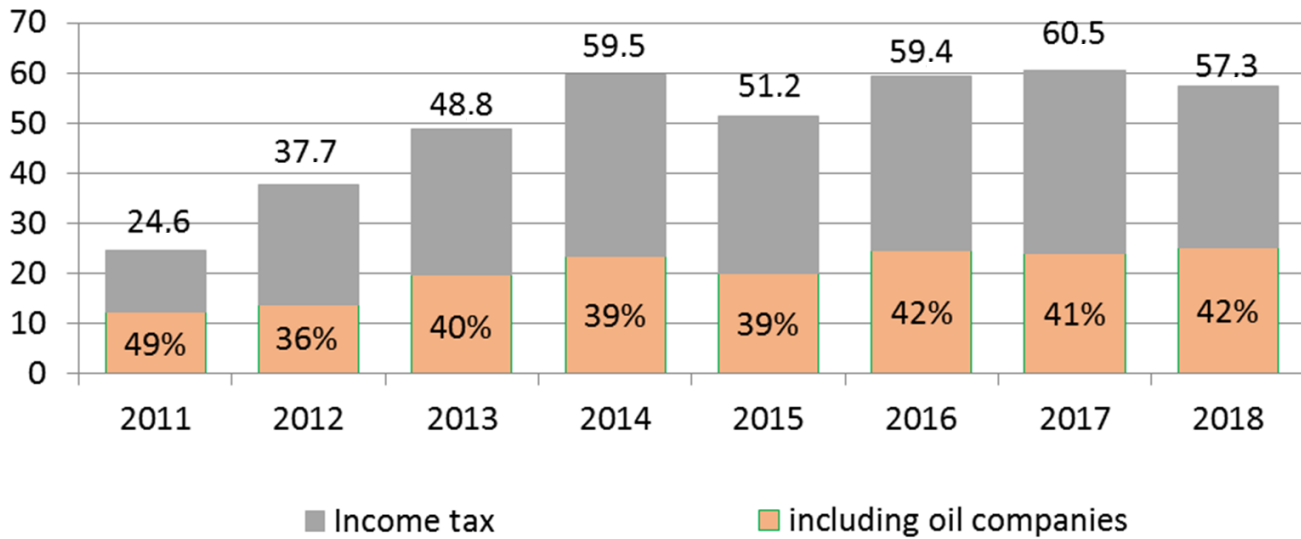
Fig.1. The volume of income tax to the budget of the Republic of Tatarstan, billion rubles

In the future, this dependence on the oil sector is going to bear not only economic risks, due to the declining cost of oil on the world market, but also those of environmental safety. Therefore, it is necessary to develop the sector of high-tech, knowledge-intensive and innovative products. As we have noted earlier, in developed countries, gross domestic product growth of more than 70% falls on innovative products and science-intensive products, which means that it is necessary to invest as much as possible in the development and formation of intellectual and innovative potential (Akhmetshin, 2017).

However, this is possible only with a high level of human capital in the field of scientific and innovative activity. Human capital combines the competencies and skills of people. Their relationship becomes the basic component of intellectual capital; intellectual capital, in turn, together with financial capital make up the common value of companies and regional systems (Gabaidullina et al., 2018). Therefore, it is so important to coordinate the actions of regional mechanisms in the field of human capital formation.

3.2. The human capital management system of the Republic of Tatarstan in the field of innovation

For this reason, since 2012, more and more attention has been paid in the Republic of Tatarstan to innovations and human capital showing high potential. Consider human capital and its indicators characterizing the premises of its development and use in the field of innovation (Table 2).

Table 2. Innovative and intellectual potential of human capital of the Republic of Tatarstan

Parameter Name	Yearly Values					
	2013	2014	2015	2016	2017	2018
1. Intellectual and Innovative Potential						
Coverage of the population with higher education programs,%	30.3	29.9	29.2	27.5	26.5	26.4
Of these, due to the budget allocation,%	42	45	46	49	51	52
Average cost of higher education for 1 semester, rubles	31973	34500	39502	43751	48159	53350
Proportion of economically active population with higher education (among population groups of 25 to 64 years old),%	31.5	32.7	33.1	34.5	35.1	36.3
Number of graduate students and doctoral students per 100 thousand people	110.5	113.7	115.2	112.5	114.2	115.3
Number of personnel engaged in research and development, per 10 thousand people. employed in the economy	72.8	75.4	72	36.3	37.6	37.8
Number of articles published in peer-reviewed journals indexed at the	27.2	22.8	20.3	16.9	10.5	4.3

Russian Science Citation Index, per 100 researchers.						
Number of patent applications for inventions filed with Rospatent by national applicants, in relation to the number of economically active population, per 10 thousand population	551	668	550	602	564	592
2. Investment in Science and Innovation						
Share of domestic research and development costs in gross regional product, percent	0.75	0.9	1.05	1.4	1.77	2.0
Proportion of the cost of research and development, financed from own funds of organizations, percent	30.0	33.0	35.0	36.0	38.0	40.0
Public spending on education, as a percentage of gross regional product	22.4	23.1	21.3	19.1	17.2	21.0
Shares of investments in education, to the total volume of investments in fixed assets to GRP	1.4	2.3	2.3	1.7	2.6	1.2
3. Intellectual and Innovation Performance						
Share of innovative products in gross regional product, percent	15.6	14.9	18.4	21.1	20.5	20.4
Share of high-tech and knowledge-intensive industries in GRP,%	18.4	19.9	20.6	19.3	20.5	18.8

According to the above Table 2, the Republic of Tatarstan has a huge reserve of human capital, especially in the field of innovation. However, in recent years there has been a noticeable decrease in innovation processes, since there has been an almost twofold reduction in the number of scientists, with no change in the number of doctoral school graduates. In addition, the level of accessibility of higher education is declining more and more due to a significant increase in the prices of higher education programs (Tarman, 2016; Tarman and Chigisheva, 2017). There is a drop in inventive activity of the population. At present, the accumulated human capital allows maintaining a high level of innovative activity in the region, however, continuing negative trends may cause a number of problems in the future, which indicates an insufficient degree of control over the processes of human capital formation and development in the interests of innovative progress.

Consider the management system of human capital. As it is, the human capital management system of the Republic of Tatarstan is a set of interconnected systems, programs and management methods involved in the development, formation and use of human capital at the federal, regional and municipal levels. The parts of the human capital management system in the Republic of Tatarstan considered as the most important are as follows (Figure 2):

• Ministry of Education and Science;
• Ministry of Labour, Employment and Social Protection;
• Ministry of Youth and Sports;
• Ministry of Culture;
• Ministry of Economics;
• Ministry of Health.

These ministries, within their competences, participate in the formation, accumulation and use of human capital of the Republic of Tatarstan. In addition to ministries, there are many commissions and councils. One of them is the Interdepartmental Commission for the implementation of the state personnel policy in the sectors of the economy of the Republic of Tatarstan. The next body is the Government Commission of the Republic of Tatarstan on science, technology and innovation policy. It is also worth noting that in 2014 the Council on Personnel Policy under the President of the Republic of Tatarstan was created in order to effectively use the personnel potential, promote the development of the system of state civil and municipal service in the Republic of Tatarstan, and implement a comprehensive personnel policy. In order to develop human capital as a driving force of the economy, a strategy for the development of human capital was launched in the Republic of Tatarstan in 2014 - the

Republic of Tatarstan Strategy 2030. In this strategy, a special role is given to the development of the institutional grounds for the formation and development of competitive human capital (Fig. 2).
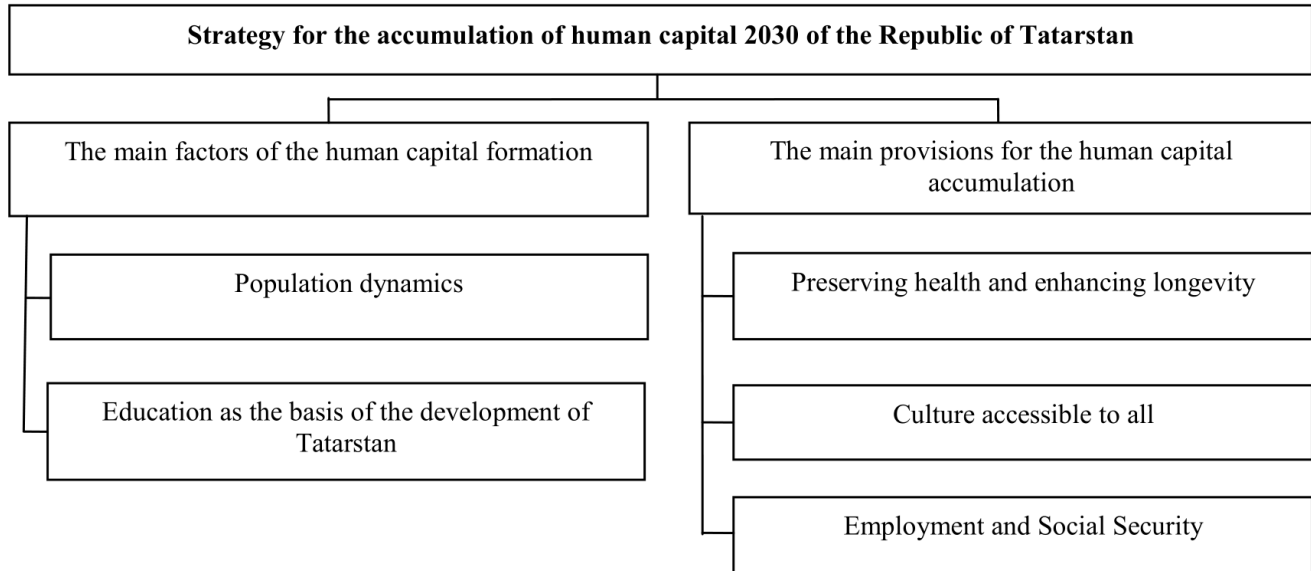
Fig. 2. Human Capital Development Program of the Republic of Tatarstan

Thus, the formation of the unified strategy of the Republic of Tatarstan 2030 is an attempt to combine innovations and the human capital management system. However, due to poor preparation and problems in the regional economic system, this program is not being fully implemented and the program phasing regulations are not followed.

Regarding the innovation system of the Republic of Tatarstan, the innovative potential of the region is determined by the presence of a number of premises for the formation and implementation of innovative activities, namely the existence of a developed intellectual and innovative infrastructure in the form of research and development institutions, appropriately trained personnel, and a developed personnel training system capable of active interaction with industrial and other sectors of the economy (Vasilev et al., 2017; Erokhina, 2013). Today, the Republic of Tatarstan has created almost all types of infrastructure for economic and scientific activities: a special economic zone, a technopolis, industrial parks, science parks, business incubator zones, Innopolis. Residents of the above subjects of innovation infrastructure are mainly representatives of foreign small and medium enterprises (Krotkova, 2016). In addition, clustering is particularly well developed. The experience of applying the cluster approach in Western countries shows that, clustering as an economic model is more effectively applicable in the issues of innovative interaction of regional economic systems (Kolpak et al., 2017; Chernetsov, 2015). In addition, economic clusters act as an important tool in modern state innovation policy (Tsertseil, 2017; Nahm, 2011; Mazur et al., 2017; Neizvestnaya et al., 2018; Kolmakov et al., 2019). They were conceived as tools that could combine many areas of economic activity that are separate elements of the region's innovation system (science, business, education, etc.) and ensure their structural updating (Barmuta et al., 2017). These structures were created as part of the innovative strategy of the Republic of Tatarstan, the provisions of which, in the form of an organizational structure, are also taken into account in Strategy 2030.

In the framework of the 2030 program of the Republic of Tatarstan, the following innovative structure of the region is planned (Fig. 3).
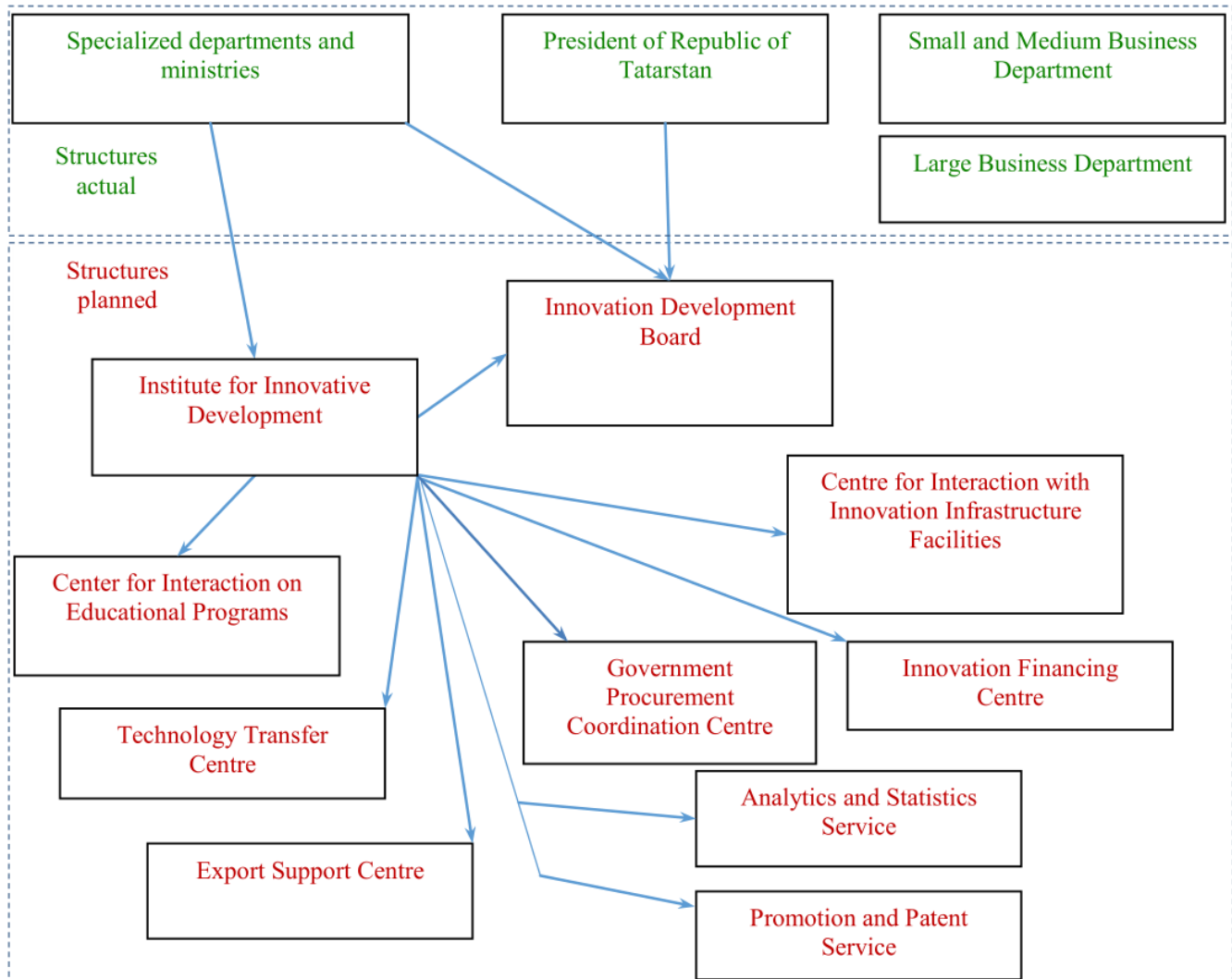
Fig.3. Structures of the system of innovative development of the Republic of Tatarstan

* already created structures are marked in green, planned ones in red.

In this innovative structure, according to the authors, number of units are absent that are important in the framework of innovative development, and there are no units that would be responsible for monitoring the implementation of development targets. Also, there is almost no system of reporting and accountability, and that of control of some structures.

3.3. Proposed Measures to Implement the Control Function in the Human Capital Management System in the Strategy of Innovative Development of the Republic of Tatarstan
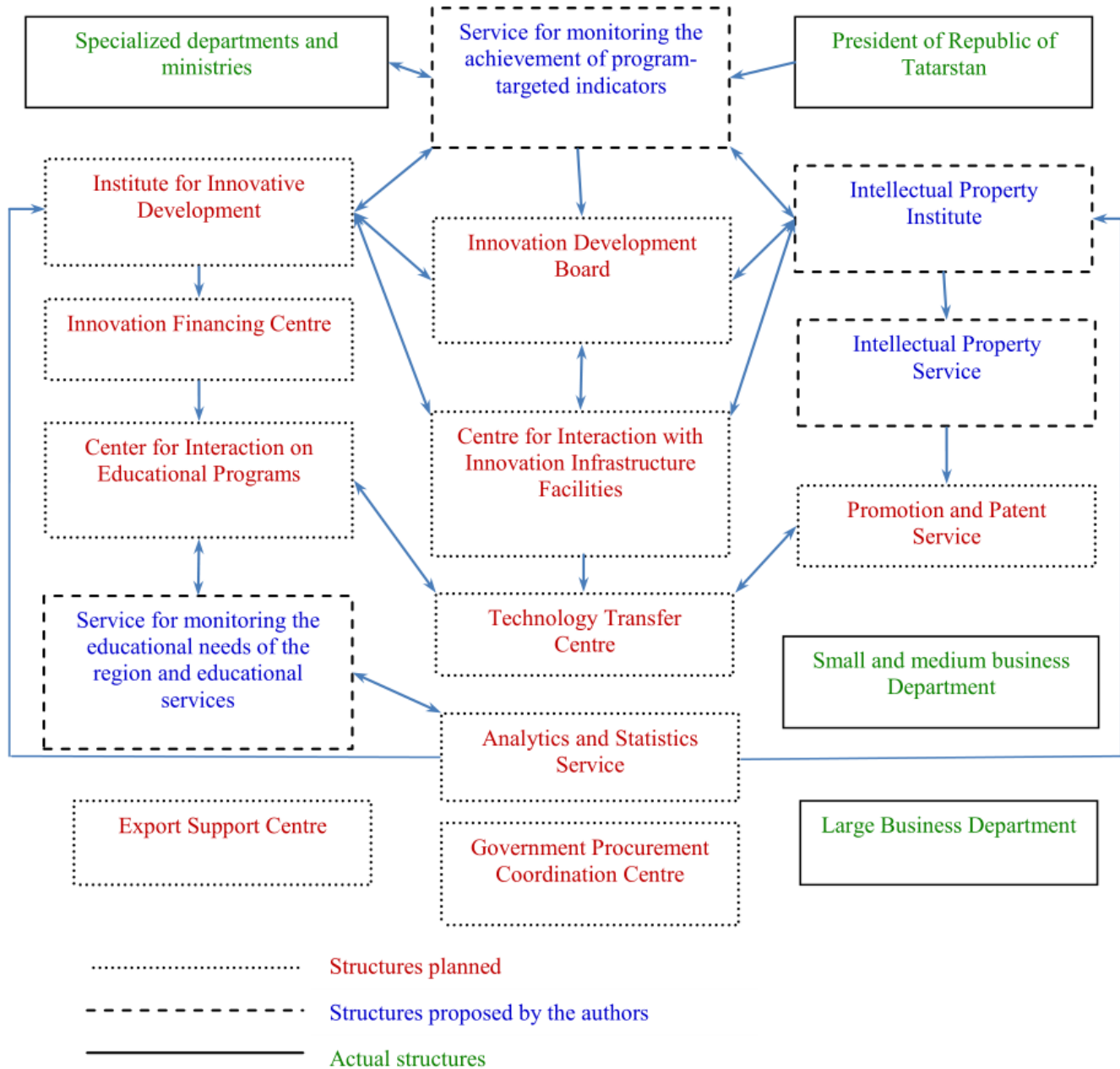
Fig.4. The proposed augmented scheme of the innovative structure of the Republic of Tatarstan

* already existing structures are marked in green, planned ones - in red, those proposed by the authors - in blue.

Within the framework of the structure offered, it is proposed to introduce several monitoring services, namely:

1) A service for monitoring the achievement of program-targeted indicators, which is to monitor the overall effectiveness of the human capital development strategy in general, and within the framework of innovative development. This service should identify the reasons for not achieving the goals and objectives set, as well as present for public review the annual results of the effectiveness of innovation in all programs.

2) Creation of the Intellectual Property Institute. This will significantly increase the inventive activity of citizens, as the intellectual property market will be formed, and the process of patenting the results of intellectual activity, their publication, application and protection will be supported by the intellectual property service.

3) Service for monitoring the educational needs of the region and educational services. This service will be responsible for the annual adjustment of the region's needs for highly qualified human capital, it will also monitor and regulate the price level for educational services of regional institutions, in line with the current socio-economic situation.

4. Discussion

Based on the data obtained during the study, we can draw the following conclusions:

1) In the future, the economic growth of developed countries will be ensured by scientific and technological progress and the intellectualisation of the main components of the means of production in all areas of the economy. Russia should enter the new stage of development and be among the leading countries in scientific, technical and innovative development (Rahman and Bobkova, 2017; Yemelyanov et al., 2019). To ensure sustainable economic growth in the country in the long run, it is necessary to make the transition to an innovative type of development and to get rid of raw material dependence. This scenario is only possible with efficient mechanisms for the human capital formation and development in innovative sectors of the economy not only in regions, but also in the private sector as a whole. The effectiveness of the innovation management system in this case is largely determined by the control subsystem that meets the adequate, timely goals and objectives of the regional development management (Vasilev et al., 2017).

2) One of the main values of the socio-economic development of the regions is control over the volume of investments in human capital in the interests of innovative development (Qu et al., 2017). The choice of an investment object cannot be spontaneous and must be justified, since choice is a complex process of careful selection, evaluation and analysis of various options. Then comes the final choice of the object (Artemova et al., 2017).

3) Control over fulfilment of objectives is meant to assess the need to change the strategy based on the results of the intermediate stages of the implementation of strategies. Tasks to be monitored usually fall into one of two types: regional results achieved in the intermediate stages of the overall long-term strategy, and strategic project results (Gabidinova, 2016).

4) Quantitative and qualitative indicators traditionally used in management, methods of ignoring non-financial indicators, such as product quality and customer satisfaction, staff quality and training, product innovation, flexibility and adaptability of production and management systems and technologies, lead to optimisation of the company's activities in the short term. However, in parallel, this leads to a contradiction of the results of managerial control to the development strategy of the company, the disregard of the influence of the external

environment and the activities of competitors, which is also natural for regional economic systems (Mullakhmetov & Sadriev, 2018; Schäfer. 2001; Vasilev et al., 2018).

5) The current human capital management system in the interests of the innovative development of the Republic of Tatarstan has a number of shortcomings related to the organisational structure, in particular, the lack of control groups in various fields responsible for both the formation of human capital and the development of mechanisms for activating labour in the field of innovative activity (Abilova, 2010; Dudin, 2017). The program for the human capital development of the Republic of Tatarstan 2030, does not give a comprehensive picture of the target indicators for the development of human capital and a number of other, no less important indicators, including the linking of performers and accountability in the executing structures. The introduction of mechanisms to control pricing in personnel training and intellectual property services on the part of the regional system will significantly improve the accessibility of higher education, and therefore indirectly affect the growth of innovative and inventive activity.

Conclusion

In conclusion, it is worth noting that in the context of the region's innovative development, the human factor, namely human capital, becomes the main driving force behind innovation processes and activities. It is this indicator that determines the effectiveness and formation of socio-economic programs for the development of regions and the activities of authorities using powerful institutional control systems (Morozov et al., 2018; Stoyanovskaya, 2014).

The study has shown that when organizing the management of regional systems, it is the control function that is one of the most important elements of management not only in the private sector, but also in the public sector, as it is responsible for achieving the goals and objectives set for the region (Mullakhmetov & Nazmiev, 2015). This is especially relevant and important in the field of human capital management in the strategy of innovative development, which requires a high level of development and rapid adaptation to constantly changing modern conditions.

It was found that the Republic of Tatarstan has a strong human potential in the field of innovation, developing under the Strategy of the Republic of Tatarstan 2030, however, in this system there are not enough control bodies and a number of other structures, which is going to negate in some time all the results achieved, as the accessibility of higher education of the population tends to significantly decrease, the inventive activity of the region is becoming less intensive due to the lack of an intellectual property institution, and a number of other reasons. In view of this, we propose our own innovative structure of human capital development, with additional control elements.

The proposed organisational control structures in the innovation system of the Republic of Tatarstan can help in the human capital formation to ensure the strategy of innovative development and create favourable conditions for pursuing innovative and investment economic policies of the region.

Thus, it is necessary to continue the active development and modernization of the existing programs for the human capital development. Tatarstan needs emphasis on the preparation of innovative programs for territorial clusters, priority development areas and special economic zones, the creation and development of which is laid down in the strategic development program of Tatarstan until 2030, using the main factor - human capital. It is necessary to develop strategic programs for the development and support of domestic business in the framework of import substitution, attracting local small and medium-sized businesses, providing them with financial and informational support. The development of joint activities of regional universities and national companies will

increase the quantity and quality of high-tech products that can meet current and future global challenges. However, all this is only possible with a balance of regional human resource needs and their potential values in various sectors of the economy (Abilova, 2010). Therefore, this topic requires further in-depth research and individual studies, especially in the staff training system, human capital management and its control system.

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INVESTMENT APPEAL OF A REGION AND ITS IMPACT ON INVESTMENT INFLOWS

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Abstract. The study is aimed at assessing the impact of several indicators of investment appeal, namely, domestic research and development expenditure and the rate of employment, on the inflow of investment to a region. The Russian regions' data were used to run factorial analysis of variance of investment in fixed assets against the variance of R&D expenditure and rate of employment: factors' influence was estimated significant with a greater impact from domestic R&D expenditure on the capital expenditure. The study proves that investors, when making decisions about investing their funds, pay attention primarily to the extent of intellectual potential development in a region, rather than to labor availability. Consequently, the strong influence of this factor on the inflow of investment makes it possible to conclude that regions that have reached the greatest level of intellectual potential development have every reason to be the most attractive for investors.

1. Introduction

Investment problems have always been the focus of economics studies. This is since investment affects the deepest foundations of economic activity, determining the process of economic growth in general. Investment process activization is one of the most effective mechanisms of socio-economic transformation. In modern conditions, investment is the most important factor influencing technical progress, providing favorable conditions

to recover from economic crises, enabling structural changes in an economy and the growth of qualitative indicators of economic activity and development.

Currently, the increasing globalization of the world economy and the attendant factors of the deeper international division of labor, free movement of goods and services have led to an increase in the requirements for the investment appeal of territories competing for resource mobilization. The output performance, fixed assets availability and capacity, as well as their modernization status, structural shift in the economy, social and ecologic problems resolution depend on investment policy efficiency.

Lack of foreign investment in the economy, as a rule, is the result of its low investment appeal. Institutional and legislative insecurity of investment activity, low informational transparency of companies' financial statements, substantial tax burden, lack of required qualifications of personnel, political instability, weak infrastructure development - all these can limit the amount of potential investment and reduce capital expenditure.

When considering the problem of investment appeal, particular attention should be paid to the methods used for its assessment. The prospective state of a country's socio-economic system and its social and political stability depend on effective solution of such an important problem. In modern conditions, the center of gravity of socio-economic processes' management is quite actively and consistently moving from the federal to the regional level. The tendency to expand the powers of the regions covers the sphere of their cooperation with investors. Many regions already use this skillfully, developing their own investment policies and shaping the investment culture.

2. Literature review and methodology background

2.1. The conceptual framework for investment appeal studies

The problem of investment appeal assessment has a sufficient theoretical basis. Investment in conjunction with regional development issues is discussed in Doussard et al. (2017), Mas-Verdu et al. (2010), Takhumova et al. (2018), Samygin et al. (2017), Galanina et al. (2017), Ohotina et al. (2018), Baltgailis (2019), Tvaronavičienė (2019), Selivanova-Fyodorova et al. (2019).

Investment appeal is a generalized characteristic of a set of social, economic, organizational, political, socio-cultural preconditions that determine the attractiveness and expediency of investing in one or another economic system.

The impact of innovation on the regional system is studied in research by Gordon & McCann (2005), Hansen & Winther (2011), Sánchez-Carreira et al. (2018), Scott & Storper (2003), Prodani et al. (2019). A series of works reveals the functioning of the economic mechanism of a region and presents the influence of various indicators on economic space relatedness (Simmie & Martin 2010). The role of individual factors (cultural, historical, industrial, etc.) or their combination on regional development is shown in studies by Barca et al. (2012), Nikiforov et al. (2018), Putri & Sudaryanto (2018), Yeung (2005).

However, the need for comprehensive research, which will be based on the analysis of advanced world experience and its constructive adaptation to individual regional systems, remains.

Currently, there is no uniform approach to investment appeal definition among the economists. It is advisable to consider investment appeal as a combination of investment appeal and investment activity. Investment activity is the real extent of capital expenditure development in a region. Investment appeal is commonly understood as an integral characteristic of enterprises, industries, regions, countries as a whole from the perspective of potential gains, returns and risks.

Investment appeal is determined simultaneously by the influence of two groups of factors, one of which forms the investment potential (a set of conditions and factors attracting or repelling the investor), and the other – investment risks (a set of factors that influence the likelihood of unforeseen financial losses under uncertainty of investment outcomes or probability of total or partial failure to achieve investment objective).

There are various approaches to investment appeal assessment. They vary in purpose, the number of analyzed indicators and conceptual characteristics, the choice of indicators themselves. In business practice, there are three most widely recognized approaches to assessing the investment appeal of a region, a country or some other territory.

The first approach is based on an assessment of GDP dynamics, national income and industrial output. It considers the dynamics of the national income distribution, IS/LM proportions, quality of investment regulation, development of financial markets, including the stock market and the money market. Proponents of this approach consider the level of asset utilization to be the main indicator of investment appeal: earnings before interest and tax to total assets, or alternatively – retained earnings to total assets.

The second approach is based on the compilation of enlarged groups that consist of indicators that are close in meaning and are called factors. Indicators are not analyzed separately, but as an enlarged group - a factor affecting the investment appeal. These include: characteristics of economic potential, general economic conditions, maturity of the market environment in a region, political, social and socio-cultural, organizational, legal and financial factors. The main advantages of a multifactor approach to assessing the investment appeal are the use of statistical data that exclude subjectivity assessment, a differentiated approach to various levels of an economy, and the drive to provide the widest possible overview of all possible sources of investment.

The third approach is the risk-based. Its supporters consider two basic concepts as components of investment appeal: investment potential and investment risks. The risk method of analysis and assessment of investment appeal allows an investor not only to assess investment attractiveness of a territory, but also to compare the level of risk inherent in the new investment object.

It is crucial not only to ensure events that contribute to increasing the investment appeal of a region, but also to correctly assess the effect of their implementation. There are still gaps in regional systems of statistical indicators, methodological aspects of statistical analysis of regions' investment appeal are underdeveloped, the issues of improving regional statistics need to be resolved, methods for assessing the effect of investment on regional development are not in place, the risks arising not only from lenders, but also from borrowers and guarantors are far from being evaluated and mitigated. The lack of reliable assessment of investment potential, of risk factors and their impact on investment, low information transparency etc. indicate the insufficiency of research conducted in this field.

2.2. Methodology of modelling investment appeal indicators' influence on investment inflow to a region

The research objective was to assess the impact of investment appeal indicators (rate of employment; domestic research and development expenditure) on the inflow of investment to a region. The Russian regions' data were used for the empiric study.

The methodological basis of the study was multi-factor analysis of variance - a method for studying the differences between mean values of two or more samples. Variance analysis is used to analyze objects that have dependent indicators measured on an interval or relative scale, and one or more independent factors that should be categorial. Variance analysis is used as a test of statistical significance of differences in sample means between

two or more sets. The null hypothesis states that all sample means are equal. This test is carried out by disintegrating the sum of squares into components, that is, by splitting the total variance into parts, one of which is due to random error (that is, intragroup variability), and the second is related to the difference in mean values. The latter component of variance is then used to analyze statistical significance of differences between mean values. If this difference is significant, the null hypothesis is rejected, and an alternative hypothesis about the existence of difference between the means is accepted.

In our case, to assess the impact of investment appeal development in a region on amount of investment in fixed assets, it is rational to use multifactor (factorial) analysis of variance using the following algorithm:

1. Determine the dependent (Y) and independent (X) variables.

2. Divide the Xs data into groups according to their values. For each group of X, there are mi observations of Y. Sample size across the groups can be different.

3. Find the common and intra-group mean values of influencing factors in each group.

4. Examine the difference between means of an independent variable in different groups using multivariate analysis of variance, that is, by splitting the total variance into parts, one of which is due to random error – intragroup variability, and the other – is related to the difference of factor means.

5. Determine the degree of the two factors combined influence (multiple correlation).

6. Check the significance of factors' influence on Y using the F-test.

7. Estimate the effect significance of each factor.

8. Determine the relative importance (degree of influence) of each factor on the Y. Calculate the ω^2 criterion for the factor.

To perform the analysis, the following factors determining the investment appeal were chosen:

X1 – domestic research and development expenditure, thousand rubles;

X2 – rate of employment, %.

The dependent variable (Y) was set to be the volume of fixed capital investment of a region.
81 regions' data were used, see table 1 for reference and example.

Table 1. Function and argument values for selected regions

	Region	Fixed capital investment (in current prices), mln. rub.	Domestic research and development expenditure, mln. rub.	Rate of employment (15-72 years old),%
1	Belgorod oblast	143802	1779,9	67,3
2	Bryansk oblast	68320	704,3	64,3
3	Vladimir oblast	78456	4511,5	65,7
4	Voronezh oblast	270999	6436,1	63,0
5	Ivanovo oblast	22616	642,0	64,8
6	Kaluga oblast	80081	9283,7	67,8
7	Kostroma oblast	26474	137,1	63,6
…	…	…	…	…
81	Sakhalin oblast	247986	1182,5	68,6

Next, a binary scale of independent variables was introduced to divide respective data into four groups according to the levels of independent variables (table 2). Variable means were used as a criterion for sampling, no censoring was applied to data.

Table 2. Independent variables' sampling results

Rate of employment, %	Code marker	Total domestic R&D expenditure, millions of rubles	Code marker
Below 64.0	A	Below 11636.6	1
Above 64.0	B	Above 11636.6	2

Prior to analysis, the null hypothesis (H0) of research was proposed: means of fixed capital investment in groups that differ in the rate of employment and R&D expenditure are equal. Consequently, rate of employment and R&D expenditure do not affect fixed capital investment in a region. Alternatively, hypothesis H1 states, that indicators' means are not equal across the groups, thus rate of employment and R&D expenditure do affect the total investment. The strategy is to find out whether regions with different rates of employment and R&D expenditure differ in the value of investment in fixed capital.

3. Results and discussion

Table 3 presents the results of factorial analysis of variance carried out to verify the group-wise differences of regions, broken down by indicators of domestic expenditure on research and development and the rate of employment, in relation to the resulting indicator – fixed capital investment in a region.

Table 3. Intergroup factors

Indicators	Groups	Number of regions
Rate of employment	A	37
	B	44
Total domestic R&D expenditure	1	68
	2	13

Total and intra-group means of fixed capital investment across the groups of regions presented in table 4.

Table 4. Intra-group and aggregate means of fixed capital investment

Rate of employment	Total domestic R&D expenditure	Mean Capex	Sample size
A	1	100410,0	34
A	2	208667,3	3
B	1	153870,8	34
B	2	514119,8	10
Total		177935,1	81

As can be seen from table 4, the highest average value of investment in fixed capital corresponds to the group with a high rate of employment and domestic expenditure on research and development, and the smallest - with a low level of both indicators. Moreover, the average value in the group with a high rate of employment and a low level of R&D expenditure (B1) is less than in a group with a low rate of employment and a high level of R&D expenditure (B2). Thus, we can conclude that the volume of investment in fixed capital in a region is directly related to the rate of employment and R&D expenditure, and the latter indicator has a greater impact on investment.

Next, we analyze the content of table 5 – "Intra-Subject Effects Test". This table is central to the analysis of variance output since it indicates the presence or absence of significant differences between the categories of variables studied. Especially important here is the value of R^2, reflecting the proportion of the total variance in the dependent variable. In other words, this is the part of the function variance that can be explained by the variance of independent variables. The second point to be assessed is the actual significance of differences between groups

of the dependent variable. This conclusion about each of the variables can be made from the p-level column. The minimum value corresponds to the factor having the greatest impact.

Table 5. Intra-Subject Effects Test

Source	Factor variance Sum of Squares	df	Factor variance Mean Square	F	H0 probability p-level	ω^2
Intercept	1939750935 359	1	1939750935359	39,3	0,000	0,598
Rate of employment (Emp)	261743147953	1	261743147953	5,3	0,024	0,293
R&D Expenditure (RnDe)	445992338014	1	445992338014	9,0	0,004	0,387
Emp * RnDe	129023564410	1	129023564410	2,6	0,11	0,753
Error	3798919814229	77	49336620964			
Total	5155988529164	80				

$R^2 = 0,263$ (Adjusted $R^2 = 0,234$)

The calculated degree of the two factors influence – the multiple correlation indicator – is not high enough and amounts to 0.263. These results allow to conclude that the selected indicators (rate of employment and R&D expenditure in a region) together do not have a significant impact on fixed capital investment, and within each group of factors X_1 and X_2 there is no variability, yet there is some between groups.

The probability of the null hypothesis of 0.11 casts doubt on the joint influence of factors on fixed capital investment. Since the full effect of the influence of two factors is statistically significant, then in the next stage we will consider the significance of the interaction effect of these factors. To do this, F-statistics criterion is estimated. In our case, the interaction between the factors is statistically significant, since F-statistics value is 2.6 and exceeds the benchmark of 2.2.

The existence of interaction between factors suggests that the influence of any one factor depends on the value of another independent factor. The analysis showed that the rate of employment in a regional economy has an impact on the inflow of investment into a region, but this influence is stronger in combination with the level of expenditure on research and development. This is evidenced by the lower probability of the null hypothesis (0.11), the greater value of F-statistics (2.6) and the indicator ω^2 (0.753) compared with the values of these indicators for each of the factors separately. Thus, a high rate of employment in a region, combined with a high level of expenditure on research and development, leads to a high value of fixed capital investment in a region. In addition, we can mention the separate influence of each of the factors on the function (probability of null hypothesis, stating that these factors do not affect the investment, in both cases is under 0.05).

The degree of each factor influence on investment can be determined using the criterion of ω^2. According to the estimates, the first factor (R&D expenditure) significance in terms of the influence on investment is quite high at 38.7%. The contribution of the second factor (rate of employment) to the full variance is also significant and amounts to 29.3%.

Thus, based on the analysis results, it can be concluded that fixed capital investment in a region is closely related to domestic expenditure on research and development and to the rate of employment. Investment inflow to a region is significantly dependent on domestic R&D expenditure: the factor contribution to total variance of investment amounts to 38.7%, compared to the less but still significant factor of relative employment in a region (29.3%). Low probability of the null hypothesis (presuming no influence of employment and R&D expenditure on investment) allows to reject it and consider the influence to be significant and verified.

5. Conclusion

The analysis results can be interpreted as follows. Investment inflow to a region, and consequently the region's investment appeal, is more dependent on domestic research and development expenditure rather than on the rate of employment. This means that when making decisions about investing their funds, investors first of all pay attention to the extent of intellectual potential development, not to the labor availability. The strong influence of the intellectual factor on the inflow of investment makes it possible to conclude that the regions that have reached higher level of intellectual potential development have every reason to be the most attractive for investors. Regional authorities' effort to support science and education affects the regional investment appeal significantly. However, it is not true that labor availability is ignored by investors.

Over the past decade, regional authorities have realized the importance of attracting investment and even included investment policies in strategic development plans. Investment policy cannot be implemented without properly linking it with the regional development strategy. However, some strategies have a number of flaws that need to be addressed before considering investment measures.

The process of developing an investment policy requires setting clear goals and objectives, as well as a detailed analysis and consideration of the results of regional development at a given level of investment inflows. The investment policy should identify priority sectors for the region and specific investment projects, the comparative advantages of which should be reported to the investor; develop measures to create mechanisms to protect the rights of investors; consider the possibility of creating, at the expense of the regional budget, insurance and pledge funds guaranteeing the observance of obligations to investors; develop a mechanism of individuals' funds raising in investment projects, etc.

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INFLUENCE OF CORPORATE CULTURE ON THE SYSTEM OF MANAGEMENT IN MODERN CONDITIONS[*]

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Abstract. The main goal of the research of to reveal and classify sectoral and regional peculiarities, affecting the effectiveness of corporate culture use in the system of company management; to determine the character of this influence; to make conclusions on the possibilities of improvement of efficiency of the management at the businesses of the Republic of Tatarstan on the whole and in the petrochemical sector particularly. The authors developed their own conceptual system on the basis of which the research was conducted, namely: the authors' own understanding of a corporate culture was provided; its structure and functions are determined; factors of influence on corporate culture formation are revealed and classified. Increase of corporate culture role in the system of management, development of all its elements and functional extension compose significant reserve for the improvement of the efficiency of company management.

Keywords: management system; corporate culture; petrochemical sector; sectoral factors; regional factors; management effectiveness

1. Introduction

Now, under conditions of "new economics", based on constant generation of product, technological and organizational innovations, strategic competitive advantage is based at the level of business-processes, efficient functioning of which depends on the quality of management (Gafurov et al., 2012).

In virtue of drastic changes of factors of functional environment of modern organizations, the search of new concepts, systems and technologies of management for efficient management is required. The resulting vector of changes suggests transition to "soft management" in various forms (Adizes, 2017), (Hemel, 2009). In this case in the conducted researches a significant role is given to formation of positive corporate culture, agreed with the strategy of organization (Castells, 1996), (Castells, 1997), (Castells, 1998), (Thompson and Strickland, 2013), (McGoff, 2012), (Liker, and Hoseus, 2008), (Bernardi, 2019), (Girdzijauskaite et al., 2019).

The corporate culture, which has among other things guideline value, regulating activities and behavior of people by means of generally accepted informal rules, encourages flexibility and adaptivity of organizations. The authors of the book "Scenario planning: relationship between the future and strategy" singles out the following as the main question in their practical activity as the consultants: "How is it possible to compete successfully under ever-changing conditions?" (Lindgren and Bandkhold, 2009). They think that the answer is the content of such concepts as strategic flexibility, strategic response capability, dynamic capabilities, dynamic core competences, strategic manoeuvring, competing on the edge, robust adaptiveness and "fanky" business. In particular the following contributions for the last 5 years of the 20th century were devoted to the concepts of "strategic flexibility": "Strategic maneuvering" (D'Aveni, Gunther, 2007), 'Strategic reactivity" (Bettis, Hitt, 1995), "Dynamic core capability" (Lei, Hitt et al., 1996), "Dynamic potential" (Teece, Pisano et al., 1997), "Constant innovation" (Chakravarthy, 1997), "Strategic flexibility" (Hitt, Keats et al., 1998); Hamel (Hamel, 2000), "OODA cycle" (Haeckel, Nolan, 1993); (Blaxill, Hout, 1998), "Innovation of strategy" (Hamel, 1998), "Competition on the edge" (Brown, Eisenhardt, 1998), "Healthy" adaptability" (Beinhocken, 1999), "Business in "funky style" (Nordstrom, Ridderstrale, 1999). In fact, all the contributions offer adaptivity by means of surmounting of defense mechanisms, given by nature or acquired in the process of study and practice, using inner potential and, first of all management potential of organizations.

Enhancing the competitiveness level of economic entities is strategically dependent on creation and continuous maintenance, in the process of their functioning and development, more specifically, balance of flexibility and stability, providing efficient management. The problem is solved for each economic entity of its management under constant conditions: there are no ready universal receipts for all the times and they can't be developed; only general approaches, based on the theory of management and current experience are possible. Under given circumstances successful solutions of the problem are determined to a large extent by the level of management potential of the organization and human capital on the whole. Generalized groups of management transformation factors are given in (Mullakhmetov, 2018).

Traditional management, cultivated among other things in many organization of the Republic of Tatarstan, suggests determination of the system of parameters and maintenance of the activity of organization within these parameters. The procedure, provided by this means, decreases uncertainty level in the activity of organization, guarantees the effectiveness of management within short period of time. In this case modern organizations, being members of market relations, intensively affected by factors of environment, require constant changes.

An attempt to resolve contradictions between the order dictated by the hierarchy and the traditional management on the one hand and the necessity for continuous change dictated by the competitive market environment, on the other hand, by intensifying the goal-setting processes (continuously reviewing the strategy and the tactics for the implementation of strategic goals, breaking down the planning by periods, objects, doers, etc.) does not produce a

desired effect of the enhanced management effectiveness. Such an approach is very costly and quickly becomes virtually inexpedient due to the characteristic features of a competitive environment (multifactorality, variability, uncertainty); it is not always applicable due to a number of restrictions. Fractal management, as possible solution of the problem, can be implemented under conditions of principal quality changes of human capital and management potential and specify increased requirements to the staff, which in its turn, requires cardinal reconstruction of training system of managers, mode of thinking and national culture on the whole (Mullakhmetov, 2018).

As a more delicate non-formal management tool, culture makes it possible to control and regulate human behavior at the level of social interaction, and, by so doing, enables to decrease, in the conditions of continuous changes of the environment wherein an organization functions and develops, the level of uncertainty when making managerial decisions; in case of a positive attitude and alignment with the strategy, the organizations will establish thereby the motives for the achievement of the chosen goals. Therefore, culture enhances the internal potential of an organization and its competitiveness.

The management within which a corporate culture serves as the balancing mechanism and wherein the cultural (symbolical) environment is regarded as an underlying factor determining the condition, development, methods and trends of the organization's activities may become a significant reserve for enhancing the effectiveness of management and control. M. Casson confirms that "… efficient culture has strong moral content. Moral can overcome problems, which can't be overcome by formal procedures, based on control over fulfillment of contract conditions. For this reason strong culture decreases transaction costs and increases productivity – success of economics depends on the quality of its culture" (Casson, 2006), (Cummings, 2010, p. 246).

The goal of this research is to reveal sectoral and regional factors, which have the greatest impact of the effectiveness of corporate culture use in the system of company management; to determine the character of their influence, to make conclusion about the possibilities of improvement of efficiency of the management at the enterprises of petrochemical sector the Republic of Tatarstan by means of increase of corporate culture role, as the factor of provision of management adaptivity.

2. Methodology

The methodological basis of the research consists in universal scientific research methods: analysis, synthesis, dialectic, abstraction, methods of system, logical, structural, comparative, statistical analysis, as well as graphical methods, methods of expert evaluations enabling to research the characteristics of the system of management and the subsystem of control in the light of continuous development and interrelation with the factors of the environment wherein an organization functions and develops.

The possibilities of the grounded theory are used as the main research strategy. Initially, a hypothesis is made regarding the existence of sectoral and regional peculiarities having a significant impact upon the effectiveness of using a corporate culture in the management system. Subsequently, the following shall be determined based on the analysis and comparison of the experts' opinions derived from the open sources (monographs, textbooks, teaching guides; dissertations; articles published in the Russian and overseas scientific editions), as well as based on the analysis of the publications regarding companies' activities, corporate web-sites, internal corporate documentation received from the open sources:
  • the contemporary understanding of a corporate culture, its role and functions in a company management system;
  • the main factors that influence the formation of a corporate culture;
  • the practice of applying a corporate culture by the Russian and overseas companies in different spheres of activities;

• sectoral and regional peculiarities of the petrochemical enterprises which influence the companies' management system.

The data accumulated in the course of the research are generalized and grouped in analytical tables by a certain attribute relevant for a certain stage of research. Thereafter, based on the analysis of the data provided, conclusions are made concerning the existence or absence of the sectoral and regional peculiarities influencing the effectiveness of using a corporate culture in the management system, as well as concerning the nature of such influence.

The methodology of research includes the following stages:
1. Analysis of theoretical aspects of forming a corporate culture of an organization;
1.1. What is understood under a corporate culture; the structure of a corporate culture.
1.2. Role and functions of a corporate culture in an organization.
1.3. Main factors influencing the formation of a corporate culture.
2. Generalization and analysis of the practical application of a corporate culture.
2.1. Structure of a corporate culture in an organization.
2.2. Main algorithms of operation of a corporate culture as a management and control tool.
2.3. Significance of a corporate culture in managing a company.
3. Analysis of peculiarities of the petrochemical sector.
3.1. Peculiar features of the petrochemical sector of the Russian Federation.
3.2. Peculiar features of the petrochemical sector of the Republic of Tatarstan.
3.3. Determining the factors that influence the management system of the petrochemical enterprises.
4. A comparative analysis of the practical application of the corporate culture at the enterprises of the Republic of Tatarstan with its Russia-wide and worldwide practical application.
4.1. Detection of the influence exerted by sectoral peculiarities on the effectiveness of using a corporate culture in the management system.
4.2. Detection of the influence exerted by regional peculiarities on the effectiveness of using a corporate culture in the management system.

3. Results

At the first stage, a conceptual system was developed based on which the work was conducted at the remaining stages of the research. In the context of management a corporate culture is a system of social standards and norms that are recognized and adopted by a majority of the organization's employees and that ensures a desired behavior and acts of the personnel based on the principles of self-management and self-control, developing horizontal links in the management system and facilitating the formation of informal institutes in the internal space of an organization. A corporate culture is viewed as a result of the response by the management to the changes of the market environment.

In our work we proceed from the following functions fulfilled by a corporate culture in the management system:
1. Decreasing complexity and uncertainty due to creating an internal institutional environment and enabling its continuity, and, hence, enhancing the quality and effectiveness of managerial decisions and of the entire management process.
2. Integrating function:
• joining the components of structures and processes on the basis of the generally accepted values;
• ensuring a relation between the mission and strategy with the day-to-day activities;
• team-building.
3. Enhancing the effectiveness of the personnel performance due to:
• motivation by uniting for general goals and commitment to lofty principles;

• creating effective communications;
• improving the team climate.
4. A factor to ensure the balance between the consistency and flexibility of management.
5. Creating a distinguishing favorable image for the external environment.

The corporate culture structure we offer is as follows:
1. Value basis of a company (company mission, corporate goals and the goals of the company's top management and owners, main values of the company's top management and owners);
2. Value basis of the corporate culture;
3. Functions of a corporate culture as a management and control tool;
4. Manifestation of a corporate culture;
5. A mechanism for implementation of a corporate culture as a management and control tool (the indicators assessed, the persons responsible, the verification method).

Taking into account the peculiarities of the contemporary management, we shall subsequently proceed from an assumption that the following groups of factors influence the formation of a corporate culture:
1. External factors:
• location, environment, situation in the society and economy, peculiarities of the market, sectoral specifics;
• contacts with various groups concerning different events and actions taken by organizations (for example, the work with the Western companies is important for the Russian enterprises);
• essential changes in the properties of a human capital (educational level, civic maturity, changes in motivation);
• dynamic growth of the uncertainty level of the business environment;
• cultural environment (national, regional, business cultures).
2. Internal factors:
• the organization's history of establishment and representation of the top officials;
• characteristic features of an organization (kinds of activity, size, basic functions and technologies, goals and objectives, ownership forms);
• characteristic features of the management system (leadership style, correlation of formal and non-formal institutes, work with the personnel, personal properties of a manager/leadership properties);
• personal system of values and rules of the workforce;
• experience of interaction with the external environment.

In the course of analyzing the practical application of the corporate culture by the Russian and overseas enterprise we researched the activities of 10 companies, of which 8 were from the petrochemical and 2 – companies from the automotive sector. 2 major overseas companies (Shell, British Petroleum), 2 major Russian companies (Rosneft, Gazprom) and 4 leading Tatarstan companies of this sector (Tatneft, Nizhnekamskneftekhim, Kazanorgsintez, Ammoniy) from petrochemical sector were examined. In order to gain a more complete picture of the contemporary tendencies in the development of the corporate culture and for the purpose of comparative analysis and assessment of the leading companies in the automobile sector were also researched, Toyota and KAMAZ. The information for the analysis of the companies was derived from the open sources.

The research resulted in the following findings:
1. The level of the corporate culture artifacts in the absolute majority of the researched companies is sufficiently well developed (the companies carry out full-fledged work on forming the external level of the corporate culture).
2. Most of researched companies have gaps in many trends at the level of the corporate culture values.

3. The corporate values system in all of the companies is highly developed; however, we were not always able to definitely track, based on the open sources alone, the mechanisms of interaction of the corporate values system (missions, strategic objectives, etc.) with the values of the companies' corporate culture.

4. As a management and control tool the corporate culture may manifest itself as follows:

• it may influence the personnel management system, namely, determine the systems for personnel hiring, dismissal, reward, punishment, development, career advancement. According to the open sources, in the majority of the researched companies the corporate culture only exerts a partial influence on the personnel management system. Thus, it was discovered that all companies have put in place their own personnel development systems, and, with very few exceptions, the personnel hiring systems. The remaining elements of the personnel management system are either underdeveloped or altogether absent;

• to facilitate socialization of the employees, form the labor conditions (these elements are well developed in all of the researched companies);

• to facilitate development of horizontal, vertical and direct backward links in the management system (in the absolute majority of the researched companies the corporate culture has little influence on the establishment of the aforementioned kinds of links);

• to influence the characteristic features of the management system (priority of the social and humanitarian component, active participation of employees in the adoption of managerial decision, reduction of the management levels, quick response to the requests of the company employees, removal of barriers between the management and the subordinates). According to the accumulated data, in the absolute majority of the researched companies the influence of the characteristic features of the corporate culture upon the characteristic features of the management system is limited.

5. An inference can be made that among the researched companies the corporate culture plays the crucial role in Toyota only. Democratic principles of governance and "soft" methods of control are developed here. The analyzed managerial procedures are standardized and definitively formulated in the company. Almost all of the indications evidencing the significance of the corporate culture in the company's management were detected.

The research uncovered the sector-wide, national and regional factors determining the specific features of the petrochemical sector. Those factors were subdivided into the following groups:

• institution-specific;
• infrastructure-specific;
• economic;
• market-specific;
• those related with the staffing and provision of resources;
• those related with investments and accessibility of funds;
• those related with the technical and technological bases;
• those related with the corporate management and property rights protection;
• those related with management and corporate culture.

5. Discussion

At the moment there is no uniform understanding of corporate culture and its structure; the role of corporate culture in modern management; the means the functions of corporate culture are implemented by; factors, which determine characteristics and role of corporate culture in the organization, the possibility of their quantitative assessment; tools of corporate culture, which can affect the internal environment and eliminate contradictions of management system.

1. The following groups of opinions on those matters were singled out:

a) most often, a corporate culture is understood as follows:

Table 1. Groups of Concepts of "Corporate Culture"

What the author is primarily focused on in the concept of "corporate culture"	Sources
1. Key values/values system / value-based and regulatory space	(Biletskaya, E., 2008), (Karlof, B., & Lovingsson, F., 2006), (Vetoshkina, T., 2009), (Daft, R., 2006), (George, J, Jones, G., 2003), (Liker, J., 2017), (Mogutnova, N., 2005), (Robins, S. P., Coulter, M., 2004), (Thompson, Jr., A., A., Strickland III, A., J., 2013)
2. Collective basic vision/totality of basic assumptions (myths)/totality of basic beliefs/a system of publicly and collectively acceptable notions/totality of the most important mutual understandings	(Gaponova, O., 2011), (Kozlov, V., 2009), (Kondratyev, E., 2011), (Cooper, C., 2014), (Mullins, L., 2003), (Porshnev, A., 2012), (Kibanov, A., 2003), (Shermerorn, J., Hunt, J., Osborne, R., 2004)
3. The observed recurring behavioral models/totality of standards and stereotypes of employee behavior	(Gaponova, O., 2011), (Krylov, B., 2010)
4. Norms/principles/ rules/game rules	(Selivanova, M., 2016)
5. Sensation or climate/organization's environment	(Zakablutskaya, E., 2014), (Pierce, II. J., Robinson, R., 2013)
6. Problem solving methods acquired through experience	(Gaponova, O., 2011), (Sarkisov, S., 2005)
7. A method for describing key characteristics of organizations and business. The organization represents analogy to culture.	(Cummings, S. (2010), (Ackoff, R., 1970).
8. The essence of an organization/key comparison in the organization's concept/internal component of an organization; (19, 20).	(Greenberg, D., & Beyron, R., 2004), (Liker, J, 2017), (Krol, L., Purtova, E., 2004), (Smircich, L., 1983), (Smircich, L., 1985)
9. Factor influencing the effectiveness of the economic activity/factor uniting the organization's employees	(Karlof, B., & Lovingsson, F., 2006), (Vlasova, E., 2010), (Gaydarzhi, E., 2007), (Korotkov, E., 2004), (Mullins, L., 2003), (Sarkisov, S., 2005)
10. Corporate culture is an innovative cultural form, distinct from organizational culture	(Kapitonov, E. A., Zinchenko, G. P., Kapitonov, A. E., 2005)
11. Generated in the result of cooperation of internal factors of belief system, ideas, related to company management, the strategy of its development, means and methods of achieving goals and management decisions making, with business ethics of the organization, which shows its main values, shared by the majority of staff members, aimed at the improvement of inner potential of the organization.	(Mullakhmetov et al., 2018)

b) the following functions performed by the corporate culture are singled out most often:

Table 2. Basic Functions Performed by the Organization's Corporate Culture

Functions Performed by a Corporate Culture	Sources
1. Relation of a mission and strategy with the day-to-day activities	(Gaponova O., 2011), (Selivanova M., 2016)
2. Increasing consistency of the company's performance due to forming a definite internal institutional environment and ensuring its continuity	(Gaponova, O., 2011), (Daft, R., 2006), (Mogutnova, N., 2005), (Panferova, N., 2011)
3. Management and control tool: consciously generating positive corporate culture, you can influence behavior and activity of the staff, which determine performance and effectiveness of the organization.	(Mullakhmetov et al., 2018)
4. Enhancement of the personnel performance efficiency	(Gaponova, O., 2011), (Daft, R., 2006), (Yemelyanov, Yu., Khachaturian, A., 2009), (Korotkov, E., 2004), (Kukura, S., 2004), (Mogutnova, N., 2005), (Panferova, N., 2011), (Selivanova, M., 2016)

5. Enhancement of manageability of an organization at the expense of creating effective internal communications	(Daft, R., 2006), (Mogutnova, N., 2005), (Selivanova, M., 2016)
6. Creating a distinctive image for the external audiences	(Gaponova, O., 2011), (Mogutnova, N., 2005), (Panferova, N., 2011)
7. Decreasing the complexity and uncertainty	(Kukura, S., 2004), (Mullins, L., 2003), (Krol, L., Purtova, E., 2004)
8. Employee motivation due to commitment to lofty principles and unification for achievement of common goals	(Daft, R., 2009)
9. Joining structural subdivisions and their integration	(Schein, E., 2013)
10. Improvement of climate in the collective due to employee satisfaction	(Mazur, I., 2003), (Pierce, II. J., Robinson, R., 2013)
11. Enhancement of competitiveness	(Thompson, Jr. A. A., Strickland III, A. J., 2013), (Kibanov. A., 2003)
12. Team-building	(Cooper, C., 2014)

c) the following factors influencing the formation of the corporate culture are singled out most often:

Table 3. Basic Factors Influencing the Corporate Culture Formation

Factors Influencing the Corporate Culture Formation	Sources
External factors	
- national/ regional culture	(Neretina, E., 2006), (Panferova, N., 2011), (Pervakova, E. 2015), (Torgunakova, E., 2010)
- business specifics, business culture	(Neretina, E., 2006), (Panferova, N., 2011), (Pervakova, E. 2015)
- industry specifics	(Panferova, N., 2011)
- market specifics	(Pervakova, E. 2015)
- situation in economy, society	(Pervakova, E. 2015)
- samples of conducting entrepreneurial activities by the management companies	(Pervakova, E. 2015)
- history, location, environment	(Mullins, L., 2003)
- contacts with different groups concerning different events and acts of an organization	(Greenberg, D., & Beyron, R., 2004)
- dynamic growth of the level of uncertainty of the environment	(Schein, E., 2013)
- change of environmental factors that significantly affect the functioning and development of modern organizations	(Adizes, I. 2017), (Kibanov, A., 2003), (Akmaeva, 2017)
Internal factors:	
- representation of top managers	(Panferova, N., 2011)
- ownership form	(Torgunakova, E., 2010)
- production technologies	(Torgunakova, E., 2010)
- employee personal system of norms and values	(Neretina, E., 2006)
- basic functions and technologies, goals and objectives, size, employee management and recruitment system	(Mullins, L., 2003)
- company founders, experience of interaction with environment	(Greenberg, D., & Beyron, R., 2004)
- company founders; ethical values, rules and standards that reflect them	(George, J, Jones G., 2003)
- a good leadership component (vision, personal example, insistence and principles)	(Pierce, II. J., Robinson, R., 2013)
- managerial ideology and managerial potential	(Kukura, S., 2004)
- fundamental changes in the characteristics of human capital and socio-cultural factors	

6. Conclusion

The petrochemical enterprises' culture has a number of generalized characteristic features.

1. A high level of artifacts of the companies' corporate culture, with the enterprises normally carrying out full-fledged work for forming the external level of the corporate culture.

2. At the level of the values of the companies' corporate culture gaps were detected in many trends: those values are either underdeveloped or are predominantly declarative and not based on the actual mechanism of implementation of the declared values.

3. The enterprises have a well-developed system of corporate values, but the mechanisms of interrelation of the corporate values system (missions, strategic objectives, etc.) with the corporate values culture weakly manifest themselves in the companies.

4. As a management and control tool the corporate culture may be manifested as follows:

a) to influence the personnel management system, namely, determine the systems for personnel hiring, dismissal, reward, punishment, development, horizontal and vertical career advancement (in the petrochemical sector the corporate culture only exerts a partial influence on the personnel management system);

b) to facilitate employee socialization, to create the labor conditions (those elements are well-developed in the petrochemical companies);

c) to facilitate horizontal, vertical, direct backward links in the management system (in the majority of companies the corporate culture has little influence on the establishment of links);

d) to influence the characteristic features of the management system (priority of the social and humanitarian component, active participation of employees in the adoption of managerial decision, reduction of the management levels, quick response to the requests of the company employees, removal of barriers between the management and the subordinates (in the absolute majority of the researched companies the influence of the characteristic features of the corporate culture upon the characteristic features of the management system is limited).

5. The significance of the corporate culture in the management is weakly manifested in the petrochemical businesses.

6. Summary

Based on the results of the research the specific regional and regional factors influencing the management system of the petrochemical enterprises were determined (Table 4 and Table 5).

Table 4. Sector-Wide Factors Influencing the Management System and Corporate Culture of the Petrochemical Enterprises

Factor determining the specific features of the petrochemical sector	Factor Description	Where it is reflected in the organization's activities
Institutional factors related with the actions of authorities	Strong influence of environmental protection requirements	Development of corporate programs related with the environmental protection
	Active participation of the state in the creation of petrochemical clusters	Establishment and development of close connections with the governmental structures
	The already existing system of corporate organizations within the oil complex, whose activities was directed at protecting the commercial interests of the sectoral business	Establishment and development of inter-sectoral interrelations
	Effective development of the national petrochemical industry is largely dependent on the character and degree of the state participation of the state in this process	Establishment and development of close relations with the federal authorities
	The Russia's government follows the policy of supporting the major integrated oil companies and industry consolidation	Formation of the administrative resource
Infrastructural	Priority of the cluster development of the industry, formation of 6 petrochemical clusters	Establishment and development of close inter-sector relations

	Availability of major vertically integrated structures	Establishment and development of close relations with other enterprises involved in technological production chains
	Insufficient integration of the petrochemical complex production enterprises	Establishment and development of close inter-sector relations
Economic	High growth rates	Растет уровень зарплат в отрасли, появляются дополнительные способы стимулирования персонала
	Shift of large-scale petrochemical production enterprises	Establishment and development of inter-governmental relations
	Shift of the focus of traditional petrochemical regions	
Factors related with the technical and technological bases	The chemical complex is one of the most science-driven sectors	Development of the Research and Development Programs
	Complexity and close technical relationship of different production stages and use of resources	Establishment and development of close relationships with other enterprises involved in technological production chains
Factors related with corporate management and protection of ownership rights	Drop in the level of confidence between the management and the company employees	Development of internal communications, formation of a corporate culture
	The gaspetrochemical complex was exposed to a frequent change of control; there were illegal takeovers of the assets	Creation of the corporate control systems, including those government-linked
	A part of oil companies got involved in shadow business	
	When products were high-priced, the company owners used to spend a considerable portion of profits for paying dividends rather than upgrading their enterprises	Development of financial control

Table 5. Regional Factors Influencing the Management System and the Corporate Culture of the Petrochemical Enterprises

Regional Factor	Factor Description	Where it is reflected in the organization's activities
Institutional factors related with the actions of authorities	Considerable attention is given RT's gaspetrochemical complex at governmental level	Establishment and development of close relationships with the regional and local authorities
Infrastructural factors	Tatarstan is included in the Volga-region gaspetrochemical cluster	Establishment and development of close inter-sectoral and intra-sectoral relationships
	Availability of a well-developed transportation infrastructure and manifold regional and foreign economic relationships	Establishment and development of inter-regional relationships
		Establishment and development of inter-sectoral and intrasectoral relationships
		Establishment and development of international relationships
Economic	The gaspetrochemical complex is the basic sector of the Republic of Tatarstan's industry. It has the cardinal significance for the functioning of all the sectors of the economies of the Republic of Tatarstan and Russian Federation.	Establishment of the corporate control systems, including those with the participation of the regional authorities.
Market-related	The gaspetrochemical complex of the Republic of Tatarstan has internal neighboring receptive sales markets for chemical and petrochemical products	Establishment and development of inter-regional relationships
	The Republic of Tatarstan tops Russia in terms of the majority of foreign economic transactions	New personnel incentives have appeared
Factors related with the technical and technological bases	The Republic of Tatarstan hosts a number of the gaspetrochemical companies that are the largest not only in Russia, but in Europe as well	Entering new markets, output of new commodities
	In the coming years, he gaspetrochemical complex	

	of the Republic of Tatarstan is planned to expand the existing production capacity of its enterprises and to build new ones.	

The petrochemical enterprises are characterized by a number of sectoral and regional peculiarities having both a positive and a negative impact upon the effectiveness of using a corporate culture in the management system. The following may be regarded as positive:

Sector-related factors:
        • a tradition to maintain plant museums; a growth of interest of the oil-sector companies' employees to the history of their sector; development of publishing and exhibition activities; traditions of maintaining professional skills, awarding titles of those best in the occupation, recognition of veterans of war and labor; a higher level of income and salaries as opposed to other sectors, new employee incentives;
        • a high level of artifacts of the companies' corporate culture, with the enterprises normally conducting work aimed at reaching the highest level of the corporate culture;
        • a system of corporate values is well-developed in the petrochemical companies;
        • a corporate culture may sufficiently facilitate socialization of employees and create labor conditions at the petrochemical companies.

Regional factors:
        • a profound sense of duty and responsibility in every company employee;
        • avoidance of conflicts, and if any arise, the participants make mutual concessions and reach a consensus;
        • good interpersonal relationships, comfortable psychological climate in the labor teams.

The factors that have a negative influence on the effectiveness of using a corporate culture in the management system of the petrochemical companies are as follows.

Sectoral factors:
        • At the level of the values of the companies' corporate culture gaps exist in many trends: those values are either underdeveloped or predominantly declarative and not based on the actual mechanism of implementation of the declared values.
        • The mechanisms of interrelation of the corporate values system (missions, strategic objectives, etc.) with the corporate values culture weakly manifest themselves in the companies.
        • In the absolute majority of the petrochemical companies the corporate culture has little influence upon the development of horizontal, vertical and direct backward links in the management system;
        • the petrochemical companies experience limited influence from the characteristic features on the characteristic features of the corporate culture.
        • great significance of the administrative resource;
        • great significance of establishment and development of close relationships with the federal authorities, of intra-sectoral and inter-sectoral relationships, relations with other enterprises included in the technological production chains.

Regional factors:
        • great significance of establishment and development of close relationships with the regional and local authorities;
        • predominance of a bureaucratic (hierarchical) culture;
        • authoritarian leadership style;
        • hierarchical relations, authority of a job title, discipline and order are the basic values at an enterprise;
        • avoidance of risks, prioritization of companies' goals;

• formalism, leading role of instructions and procedures, authoritarianism, low initiative and low creative activities.

Therefore, only certain corporate culture components are sufficiently developed at the petrochemical enterprises of the Republic of Tatarstan, i.e., those that are mainly connected with the external level of the corporate culture, whilst within the companies the number of functions that the corporate culture performs is limited. A number of sectoral and regional factors, both positive and negative, have an impact upon the effectiveness of using a corporate culture in the petrochemical companies' management system, with the factors that negatively influence the effectiveness of using a corporate culture in the management system being predominant.
Among those the most essential are the significance of administrative resources, authoritarian leadership style and formal management methods.

All of that to a large extent results in the corporate culture having low significance for company management at the petrochemical enterprises of the Republic of Tatarstan, which only confirms that there is an essential reserve for boosting the company management effectiveness at the expense of enhancing the corporate culture significance, broadening its functions and developing all of its components.

The existing level of the corporate culture development at the Republic of Tatarstan's enterprises as a whole, and at the petrochemical enterprises in particular means that underdeveloped social and cultural toolkit in the management system is today one of the main factors preventing the introduction of new effective management systems and technologies.

The business environment of the Russian companies has, due to a variety of reasons, underdeveloped market institutes, whilst the already existing ones differ from their analogues in the developed market, which causes additional difficulties for putting in place new technologies. In addition, the management effectiveness decreases due to the applicable technologies of development, adoption and implementation of managerial decision in the framework of the strict hierarchy under the conditions of a minimum formalized involvement of personnel in that process, as well as to the stiff control procedures aimed at assessing the actions of the personnel, thus nurturing their sense of duty rather than initiative and creativity.

Enterprise management in the petrochemical sector is mainly aimed at stability; characteristics determined in the process of research can't guaranty the required level of flexibility (adaptivity) in modern business environment.

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MATHEMATICAL TOOLING OF ACCOUNTING NON-ECONOMIC CHARACTERISTICS DURING THE ASSESSING PROCESS OF INVESTMENT PROJECT EFFECTIVENESS *

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Abstract. A search and analysis of sources (articles, conference materials, reviews) was conducted in the Web of Science Core Collection database from 1975 to March 2018 time period (57 sources) and in the RSCI database to March 2018 (48 sources) on the matter of using and recommendations of certain mathematical tooling in assessing the effectiveness of investment projects, taking into account non-economic characteristics. These 45 cases were identified in 41 sources of mathematical methods application in accounting for non-economic characteristics in the process of assessing the effectiveness of investment projects, their advantages and disadvantages. The recommendations on accounting for easily formalized non-economic indicators in evaluating project effectiveness were developed. Criteria have been established for classifying methods for taking into account non-economic characteristics as those that with a high degree of probability can do this in the value (money) scale. A mathematical tooling is proposed for taking into account difficultly formalized non-economic characteristics in the assessment.

Keywords: non-economic characteristics; assessment of efficiency; impact assessment; project appraisal; mathematical tooling

1. Introduction

The problem of evaluating the effectiveness of investment projects is of particular relevance in the aspect of considering non-economic characteristics (externalities). In foreign practice of project evaluation, this issue is

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studied from the angle of project impact assessment on various activity areas, on the environment, on human health, and on the stable development of society. In Russian practice this issue is less studied. In the official methodological recommendations devoted to assessing the effectiveness of investment projects (Kosov, Livshic, & Shahnazarova, 2000),("Methodical recommendations for evaluating the effectiveness of investment projects," 2008),("Method of calculation of indicators and use of criteria of efficiency of the investment projects applying for receiving the state support at the expense of means of Investment fund of the Russian Federation," 2009), this issue is studied in the framework of extremely general recommendations of a qualitative nature. The issue of an investment project's impact on the outside environment in Russian practice is considered as a question of evaluating social efficiency, based mainly on the cost approach. Nevertheless, there are works which are considered as attempts of mathematical formalization of the impact of non-economic characteristics on the efficiency and feasibility of investment projects.

This work is devoted to the analysis of the existing mathematical tooling in the arsenal of accounting of non-economic indicators, parameters in the modern methodology of evaluating the effectiveness and feasibility of projects and the development of author recommendations for its improvement. The identified frequency of using one method or another allows us to group certain assessment tools together and identify trends for their further development in application.

In order to improve the methodology and mathematical tooling for accounting of non-economic characteristics (externalities) in the process of evaluating the effectiveness of investment projects, the author's classification of their subdivision into easily and difficultly formalized project characteristics (indicators, parameters, externalities and consequences) was proposed.

2. Method of research problems

Searching for sources (articles, conference materials, etc.) on the subject matter of research in the Web of Science Core Collection database for the time period from 1975 to March 2018 and in the RSCI database to March 2018 using certain search phrases presented thus in Tables 1 and 2. Out of all the identified sources (57 from the Web of Science Core Collection database and 48 sources from the RSCI database), 41 sources were analyzed in which certain mathematical tools are used in assessing the feasibility and effectiveness of investment projects. The analysis of the identified mathematical tooling was conducted to determine the possibility of considering of non-economic characteristics in evaluating projects. Search queries and search results are presented in Table 1 and 2.

Table 1. Types of effective search phrases and the number of sources for research in the Web of Science Core Collection database

№№	English (Google Translator), Web of Science Core Collection	The number of potential sources for analysis (without considering inappropriate to the subject of research)
1	"social effective* evaluation"	1
2	non-econom* and "effectiven* evaluation"	1
3	"non$economic*" "investment project*"	1(2-1=1)
4	"non-economic external*"	1
5	"non-economic param*"	2(5-3=2)
6	"non-economic characterist*"	1(7-6=1)
7	"ecological efficiency evaluation"	2
8	"invest* project*" and "national econo*"	16(27-11=16)
9	"eco-oriented" and "invest* project*"	1
10	"invest* project*" and "global econo*"	1(9-8=1)
11	non$economic external*	2(15-13=2)
12	"invest* project*" and "world econo*"	4(7-3=4)

13	"government invest* project*" and "effectiven*"	1(2-1=1)
14	"public invest* project*" and "effectiven* evaluation"	1
15	"public invest* project*" and "effectiv*"	5(11-6=5)
16	"Large-Scale Projects*" and "effective* evaluation"	1
17	"Large-Scale Project*" and "effectiven* evaluation"	1
18	"Large-Scale Project*" and "efficiency*"	4(55-51=4)
19	"Project Appraisal" and "Impact Assess*"	11(19-8=11)
20	Total	57 (168-111=57)

Source: compiled by the authors

Table 2. Types of effective search phrases and the number of sources obtained for research in the RSCI database

№№	Russian, RSCI	The number of potential sources for analysis (without considering obviously inappropriate to the subject of research)
1	"оценка обществ* эффектив*"	16(30-14)
2	"оценка эколог* эффектив*"	6(59-53)
3	"оценка эффект*" & "инвест* проект*"& "крупномасшт*"	15(16-1)
4	"оценка эффект*" & "инвест* проект*" & "миров* уровн*"	7(17-10)
5	"оценка эффект*" & "инвест* проект*" & "народнохоз* уровн*"	1(2-1)
6	внеэкономические характеристики	3 (15-12)
7	Total	57 (168-111=57)

Source: compiled by the authors

3. Research: analysis of existed mathematical tooling in assessing the feasibility and efficiency of investment projects

The analysis of 41 identified sources of the research subject showed a wide range of methods used (mathematical tools) in evaluating the effectiveness of investment projects.

3.1. CBA method (cost-benefit analysis) or «benefit-cost» method of analysis

This method is used and recommended in 22 cases out of 45 (in 41 sources under research) (Kosov et al., 2000), ("Methodical recommendations for evaluating the effectiveness of investment projects," 2008), ("Method of calculation of indicators and use of criteria of efficiency of the investment projects applying for receiving the state support at the expense of means of Investment fund of the Russian Federation," 2009), (Kogan, 2013; Medvedev, 2015; Novikova, 2005; Orlova & Safin, 2011; Pavlov, 2002; Velikaya & Papyan, 2015; Zhevlatova, 2013; Eddelani et al., 2019; Costanza, 2006; Droj & Droj, 2015; Huging, Glensor, & Lah, 2014; Jones, Moura, & Domingos, 2014; Joseph, Gunton, & Rutherford, 2015; Korytarova & Hromadka, 2014; Korytarova & Papezikova, 2015; Noble, Gunn, & Martin, 2012; Petrova, 2016; Selle & Zimmermann, 2003; Serikov, 2013; Serikov, Korneeva, & Petrova, 2014). Mathematical tooling: common algebraic valuation method (of *CBA* and "*Cash flow*" methods).

This is an approach to assessing of benefits and losses caused by each of the alternative options of action (projects, for example), used to select one of the variations. Or, it is a methodology for analytical comparing of positive and negative consequences of using alternative options of solution, requiring the monetary expression.

We will consider this method in terms of evaluating projects of predominantly of global and national economic significance. The CBA method consists of the following steps (Andruckiy, 2009):

1. Project objectives definition;
2. Project identification and prioritization;
3. Project feasibility and option analysis;
4. Project economic impacts analysis;
5. Project investment analysis;
6. Project financial ratios analysis;
7. Multicriteria analysis;
8. Project risks and sensitivity analysis.

The CBA method is based on the "Cash flow" method, which reflects the essence of the CBA method and its one section, Project investment analysis. The application of this method is becoming increasingly problematic for evaluation and implementation of investment projects of global and national economic significance, as it requires an assessment of non-economic effects, for example, the impact on the environment and sustainable development, on the cultural traditions of society, the assessment of social consequences, a region security, etc. An important feature of this method is the conversion into the value scale of assessments of various indicators, parameters, reflecting both positive and negative consequences of project implementation. What is the way of doing it for particularly qualitative indicators? For example, the quality of the population's life, the stable development of the region, country, the security of the country, etc. Unfortunately, this method does not give a definite answer to this question. The CBA and the "Cash flow" methods are oriented towards an option of solution that provides more benefits than costs in the monetary form in the visible forecast period. And for large-scale investment projects, for infrastructure projects the benefits of a region and a country are defined as a cost estimate of the consequences in the form of a change in macroeconomic indicators – increasing of GDP and employment of population, increasing in investment in the economy, etc.

It becomes obvious that the mathematical tooling of given cost method (CBA, Cash flow) can be used for evaluation of those non-economic characteristics which can be converted into value form and taken into account in payment flows not to the disbenefit of the calculations accuracy of the resulting efficiency indicator.

3.2. Method of multi-criteria optimization based on the use of Monte Carlo method and data matching

This method is used to minimize the weights uncertainty on the decision making criteria used in the 1st case out of 45 (in 41 of the studied sources). It is in a multi-criteria assessment of the social efficiency of the building's power supply using renewable energy sources. Mathematical tooling: Monte Carlo method and data consistency method. The described mathematical tooling: (Monte Carlo method) is usually applied for solving the following tasks:

a) Defining of mathematical expectation of some random variable. For this, a set of random values of a given value is generated and its average is determined. A random variable is usually characterized by a certain probability distribution.
b) Modelling of traffic flow using the Nagel-Schreckenberg model. In this case, Monte Carlo method is used to add an element of randomness and to estimate the probability of speed change of a traffic flow (Woods, 2015).
In the analyzed work by Barbara Mendecka (Mendecka & Koziol, 2015), Monte Carlo method is used as a tool for solving a discrete multicriteria optimization problem on the stage of determining of weighting factor for each decision criterion. For being more precise, the uncertainty of the weighting factor of decision criteria using Monte Carlo simulation and the method of data matching is minimized. Since the weighting factor are set by experts, then the Monte Carlo method allows to reduce subjectivity (uncertainty) in this process.

The advantage of this method is that it takes into account the element of randomness of any complex assessment process, for example, traffic flow, efficiency of performance, impact of the consequences of realized project on the external environment, etc. But there is one disadvantage of this method. This is the need to generate independent random variables, which is quite a difficult task, and it requires the use of some functions of certain programming languages (R or Python). Also, Monte Carlo method should apply large data samples for calculations to ensure error convergence (Woods, 2015).

In solving the problem of non-economic characteristics accounting in the assessment of a project's effectiveness, the calculation of weighting factor may be intentionally missed. Because, firstly, when specifying restrictions and desirable levels for one or another characteristics, a decision maker sets the significance of one or another parameter, which "throws back" the necessity of establishing weight factors. Secondly, it is supposed to take into account ten or more indicators simultaneously, which levels the process of using weight factor. Therefore, the process of generating random variables to eliminate the process of uncertainty, the establishment of weight factor by Monte Carlo method in this problem is eliminated.

3.3. Method of assessing energy efficiency

This method is used in the eucalyptus production system. One case out of 45 (in 41 of the studied sources). Mathematical tools: energy balance calculation method.

The method of calculating the energy balance is carried out according to the formulas (Romanelli & Milan, 2010):

$$E_B = E_{OF} - E_{IF} \tag{1}$$

$$E_{ROI} = {E_B}/{E_{IF}} \tag{2}$$

where:
E_B – energy balance, MJ ha^{-1}; E_{IF} – energy input flow, MJ ha^{-1}; E_{OF} – energy output flow, MJ ha^{-1}; E_{ROI} – energy return on investment, MJ MJ^{-1}.

This mathematical tool is extremely simple and has similarities with the traditional economic evaluation of efficiency. Only here the author measures flows not in the form of cash flows, but in the form of energy flows. This model is of special interest as it uses alternative units of measure of project efficiency, namely, units of energy (MJ). It should be noted that this model has its limitations in use, because is not universal, but narrowly oriented (specific). Not all non-economic indicators can be measured by the flow of energy.

3.4. Methods of risk and uncertainty assessment

1. Scenario method (tree scenario) or theory of games with «nature» (criteria of decision choosing: rule of Hurwitz, rule of Wald, rule of Savage, rule of Laplace). It is used in 4 cases out of 45 (in 41 of the studied sources) (Noble et al., 2012),(Kibalov & Shibikin, 2017),(Kibalov, Glushhenko, & Goryachenko, 2015),(Epishkina, 2010).
The scenario method of evaluation and selection has essential value for conditions of radical uncertainty. According to this method, for solving the problem of choosing the optimal variant from the set of existing alternatives, a scoring matrix of the following form is used:

Table 3. Scoring matrix

Alternatives $x_i' \in X'$	Scenario $x_j'' \in X''$				
	x_1''	...	x_j''	...	x_m''
x_1'	u_{11}	...	u_{1j}	...	u_{1m}
...	...	...	...	...	...
x_i'	u_{i1}	...	u_{ij}	...	u_{im}
...	...	...	...	...	...
x_n'	u_{n1}	...	u_{nj}	...	u_{nm}

Source: (Epishkina, 2010)

In this matrix: $x_i' \in X'$ – is i alternative from the sets of existing alternatives X'; $x_j'' \in X''$ – is j scenario of alternative development from the sets of existing scenarios X''; u_{ij} – strategy interaction outcome (alternatives) $x_i' \in X'$ with scenario $x_j'' \in X''$.

Based on the matrix of uncertain outcomes $\| u_{ij} \|$, the most preferable outcome by a given criterion is determined, for example, the criterion of the public effectiveness of alternatives (Epishkina, 2010). Each outcome must be quantified. This is realized through expert review. In the works mentioned above for expert evaluation there will be used computer-aided support for assessment technology developed at the Institute of Economy and Industrial Production Organization of the Siberian Branch of the Russian Academy of Sciences. In any case, for appropriate evaluation and selection of the optimal variant it is necessary to have quantitative values of all outcomes. This may be a 10-point scale, the ratings for which are put down by experts in this field.

In a situation of radical uncertainty when the scenarios of actualization of these scenarios are difficult to determine and they are assumed to be unknown, then certain decision rules are used to determine the most preferred (optimal) option (Epishkina, 2010; Kibalov et al., 2015; Kibalov & Shibikin, 2017):

- the rule (criteria) of Hurwitz (*Hu*) with parameter $\lambda \in [0,1]$, which is interpreted as measure of decision-maker (DM) . For each alternative value period λ is defined according to which it the best by Hurwitz rule. A special case of the Hurwitz criteria is the rule of "extreme optimism" when $\lambda = 0$.
- the rule (criteria) of Wald (*Wa*) is a special case of *Hu* criterion when $\lambda = 1$. This criterion gives opportunity to choose the option with the maximum guaranteed result under the most adverse circumstances.
- the rule (criteria) of Savage is interpreted as a rule of "minimax regret" with the help of which a strategy that minimizes maximum risk is chosen.
- the rule (criteria) of Laplace is interpreted as a rule of "insufficient reason". In this case, when nothing is known about the implementation possibility of environmental scenarios, it is assumed that the scenarios are of the same probability (without sufficient grounds for this).

It is recommended to use the criteria of Wald and Savage as the optimal values give certain information about alternatives (guaranteed result and guaranteed regret). According to the Laplace's criterion, there is no convincing interpretation, since all scenarios are assumed to be equally probable. Therefore, this criterion is less preferable. It

is also recommended to calculate the range of values of the λ parameter for which the selected project is optimal according to Hurwitz and to compare this range with acceptable levels of risk for the DM.

The scenario method is designed to solve poorly structured or unstructured (qualitative) problems. This method does not allow to quantify the impact of each non-economic indicator on the feasibility of the project (efficiency). But it can definitely eliminate or reduce the uncertainty of the project's impact on the surrounding areas of activity and rank them among the available alternatives with a certain degree of probability.

2. Risk adjustment in the discount rate (Gert, Suprunchik, Nemova, & Kuz'mina, 2009). Used in the 1 case out of 45 (in 41 of the studied sources). In principle this tooling is often used to assess the riskiness of a project being implemented. The investor or DM deliberately lays an overestimated value of the discount rate (R) in case of unexpected circumstances when calculating the *NPV* of the project. Exceeding of IRR indicator of a project over R in this case will encourage the investor to invest and implement the project with a high degree of probability. The risk is taken into account, but there is no slightest possibility to consider the influence of the remaining non-economic characteristics directly on the resulting indicator of the project feasibility (efficiency). This method is limited in use though it considers only one non-economic characteristic (riskiness) quantitatively, regardless of the nature of its occurrence.

3. Risk assessment matrix method (Mironyuk, 2015; Noble et al., 2012; Platon, Frone, & Constantinescu, 2014). It is applied and recommended in 3 cases out of 45 (in 41 of the studied sources). Risk assessment matrices are presented in two types. The first type is a matrix of qualitative description (in the form of a table), which consists of the following columns: risk category, description of risk, consequences of risk and methods for risk reduction. It allows to identify the risk and qualitatively assess its effects and exercise its control. The second type is a matrix of quantitative estimates in the form of points. Each score assigns its context and each cell has its own color. For example (Platon et al., 2014):
− Risk is not significant: <0,75 Colour code: white (no color);
− Risk is significant: 0,75-1,5 Colour code: yellow;
− Risk is important: 1,6-2,25 Colour code: red.
This matrix allows you to quantify the risk and implement its gradation.
The second type of matrix is preferred for accounting of non-economic characteristics as a risk indicator in the effectiveness evaluation. At the same time, it is clear that this indicator cannot be taken into account in the value form in the flow of payments.

The same can be said about the risks described in work (Mironyuk, 2015). This paper discusses the components of the geological environment that may adversely affect ecosystems and engineering structures or cause their destruction (geohazard). Initially, geohazards are detected, then they are ranked and their priority is set. As a result, a geohazard registry is developed using various qualitative and semi-quantitative methods: HAZID (hazard identification), AET (analysis of "event trees"), analogy method, etc. For further identification and mapping of geohazards more specific actions are used. As a result, it can be concluded that risk assessment matrices, qualitative description and identification of risks can be used at the preliminary stage of project selection in terms of risk or their quantitative evaluation in the form of points should be reduced to a normalized form for considering them when evaluating the project effectiveness according to a certain methodology.

3.5. Fuzzy (vague) sets methods

1. TOPSIS method in combination with linguistic neutrosophic numbers (LNN) (Liang, Zhao, & Wu, 2017). It is used when assessing investment risk in mining projects, 1 case out of 45 (in 41 of the sources studied). It is

essential to assess the risks of complex ongoing projects, when there is a high uncertainty in the impact of certain factors. This method allows to take into account a whole range of qualitative risk factors. Preliminary, these factors are presented in the form of linguistic neutrosophic numbers. Therefore, the initial information for decision making is presented with a certain degree of belonging to a particular linguistic variable term. At the same time, the DM cannot adequately assess the degree of importance of each risk factor directly. A weight model, based on the calculation of the maximum deviation from the ideal is used for taking into account the degree of importance of a risk factor. There is used Technique for Order of Preference by Similarity to Ideal Solution (*TOPSIS*). *TOPSIS* is the method of determining the sequence to determine the solution proximity to the ideal. The method was originally used to solve some ranking problems. *TOPSIS* is a technology developed by Hwang and Yoon (Hwang & Yoon, 1981) in 1981. The basic principle of *TOPSIS* is that the selected alternatives should have the smallest distance to the ideal solution and the maximum distance from the ideal-negative solution. In a fuzzy environment this method is called *FTOPSIS* (from the word Fuzzy). Fuzzy logic in the advanced method is used to eliminate the uncertainty of the human factor.

This technique allows to prioritize and rank risk factors in conditions of high uncertainty in the process of implementation of an investment project and thus develop weighting factors for these factors. This is essential, specific (narrowly oriented) and adequate to reality in the process of evaluating the effectiveness of investment projects.

2. AHP- fuzzy comprehensive evaluation method. This method is used to select a building agent, 1 case out of 45 (in 41 studied sources) (Hu, Zhong, Wang, & Wu, 2016). In this paper we study the problem of choosing a building agent in order to carry out government regulation, to optimize contracts and moral hazard more effectively. For achieving this aim a combination of the AHP method and the fuzzy complex estimation method is used. This approach is of particular interest in performance evaluating in the conditions of high uncertainty.

The analytic hierarchy process (*AHP*) method was put forward by T.L.Saaty, a U.S. operational research expert. The essence of this method lies in the pair comparison of several alternatives (for example, investment projects) according to several criteria (evaluation parameters). The advantages of the method lies in the fact that it allows to transfer various parameters of a physical entity into a single normalized scale and then choose the one that satisfies the DM. The method of pair comparisons allows to reduce the subjectivity in establishing weight coefficients according to certain criteria as there is set a specified rating scale. Thus, it is possible to obtain a quantitative assessment of the criterion for each alternative and to choose the best one using a predetermined method or a generalizing method. In work (Hu et al., 2016) for reducing uncertainty in the selection process and complex assessment, a fuzzy mathematical model is created: multipliers are determined, a set of estimated results and the membership matrix *R* are set. As a result, the construction of a single fuzzy complex assessment matrix allows to adjust the weights of the primary assessment factors and choose a solution option in more adequate reality conditions. This method is adequate, real and deserves to be used in the problem of taking into account non-economic characteristics when evaluating the effectiveness of projects.

3. TFIEOWA operator's method for evaluating investment risk of building industry projects, 1 case out of 45 (in 41 studied sources) (Xu, Yang, & Hao, 2017). In this article, the authors study the problem of decision-making with several attributes to assess the risk of an investment project. The mood of investors is represented as a fuzzy set with a triangular fuzzy information. The *TFIEOWA* operator is the development of the authors of the article above and stands for triangular fuzzy induced Einstein operator with weighted averaging. This operator gives opportunity to reduce uncertainty effectively in assessing the risk of an investment project based on investor mood. The work actualizes the complexity of risk accounting problem in the evaluation of investment projects, actualizes the application of fuzzy sets, the creation of a special operator based on them to take into account the subjective opinion and mood of the investor and this is the advantage of the method.

4. Efficiency criteria in the scales of fuzzy sets theory (in the form of linguistic variables). This method is used in assessing the effectiveness of a large-scale investment project (project for the reconstruction of the Trans-Siberian Railway), 1 case out of 45 (in 41 sources studied (Kibalov et al., 2015). The two-level investment decision making model proposed by the authors consists of strategic and tactical levels. At the first level, the authors eliminate the first layer of fundamental uncertainty using the model of strategic investor games with "nature". In this case a model of the Russian economy is meant, which is defined in the form of an optimization intersectoral interregional model – railway transport (*OIIM-RT*), which was developed at the Institute of Economics and Industrial Production Organization of the Siberian Branch of the Russian Academy of Sciences. At the second tactical level, the parameters and criteria of effectiveness are formulated in terms of fuzzy sets for accounting uncertainty. For this purpose, we use linguistic variables with their term-sets. Each value of a term set (term) is determined by the evaluated parameter. Thus, there are set limits and (or) desirable levels for a parameter (an indicator that has numeric value) in the form of fuzzy numbers. A fuzzy number consists of two numbers. The first number is the value of the variable base, and the second is the membership function corresponding to a specific value (takes a value from 0 to 1). Each estimated investment project for a given parameter, using a triangular function of a fuzzy set, will have at least two estimates. This is more consistent with the real situation of choice and is an advantage of the technique.

3.6. Methods of the aggregation theory (generalization)

1. Desirability function method (Harrington, 1965; A. S. Puryaev, 2009; Aidar S. Puryaev, 2015). This method is applied in 3 cases out of 45 (in 41 studied sources). The use of the Harrington desirability function allows us to convert the individual parameters of the effectiveness evaluation, different in their physical nature and dimension, into a single dimensionless scale of assessment and then transfer into a single generalized criterion. Thus, it gives opportunity to take into account any non-economic characteristics in the assessment. It would be mentioned that one need to know their quantitative estimates, as well as the limitations (or desired levels) of the decision maker on these characteristics for making such an analysis. The decision maker (investor, customer) should set boundaries acceptable for him (upper, lower, or upper and lower) and then carry out the evaluation of the project. Advantage of the method is the following: the method allows to get away from the purely cost method; the task of evaluating the effectiveness becomes the task of finding the optimum for the whole complex of parameters (characteristics), including valuable. Minor drawback: the use of a sophisticated method of transferring the value of the estimated parameter *Y* into the Harrington scale of desirability *d* by applying an intermediate transform to a scale *Y'*.

The numerical preference system presented in Table 4 is the dimensionless desirability scale developed by E.S. Harrington (Harrington, 1965). The value of this scale have an interval from 0 to 1 and are denoted by *d* (from fr. *desirable*). The value of the *i* private optimization parameter, transferred into a dimensionless scale of desirability, denoted by d_i is called the desirability partial, where is the current parameter number; *n* is the number of private parameters. The value $d_i = 0$ corresponds to an absolutely unacceptable level of the *i* characteristic (optimization parameter). The value of $d_i = 1$ – the best value of the *i* parameter.

Table 4. Scale of Desirability by E.S. Harrington

Empirical system of preferences (desirability)	Numerical system of preferences (system of psychological parameters)
Very good	1,00 - 0,80
Good	0,80 - 0,63
Acceptable	0,63 - 0,37
Poor	0,37 - 0,20
Very poor	0,20 - 0,00

Source: (Harrington, 1965)

The desirability function corresponding to the E.S. Harrington desirability scale is as follows:

- for one-sided restriction:

$$d = e^{-e^{-y'}}$$
(3)

$$y_i' = \frac{y_{max} - y_i}{y_{max}}$$
(4)

$$y_i' = \frac{y_i - y_{min}}{y_{min}}$$
(5)

where y_{max}, y_{min} - the upper and lower limits of the one-sided restriction on the i private parameter; y_i' - the value of the i private parameter, transferred into a scale of desirability.

For defining y_i' It is recommended to use not a simplified method of rationing, presented in formulas (4) and (5), but a method of determining a first-degree polynomial to take into account the interests of decision makers:

$$y' = a_0 + a_1 \times y$$
(6)

where a_0, a_1 – coefficients of the equation of line.

The coefficients can be determined by setting two control points. The DM assigns value from the scale of desirability d to two value of the noneconomic characteristic y by his discretion and desire. These are the control points. Further, according to the formula obtained by conversion from the formula (3):

$$y' = -lnln\frac{1}{d}$$
(7)

we determine the coded (normalized) value (y') of the corresponding control points. We determine the mechanism of transfer of y into y' using the two equations with two unknowns (a_0, a_1), (intermediate valuation mechanism).

- for two-sided limitation:

$$d = e^{-|y'|^n}$$
(8)

$$y' = \frac{2 \times y - (y_{max} + y_{min})}{y_{max} - y_{min}}$$
(9)

where y' is the coded value of the particular parameter y, i.e. its value on a conditional scale; n is an exponent.

After all the partial parameters (y_i) have been converted to their desirability (d_i) it is necessary to proceed with the construction of a generalized parameter of estimation (optimization), called by E.S. Harrington, a generalized function of desirability D. One of the successful ways of solving the problem of choosing the optimal variant is representation of the generalized desirability function as a geometric average of particular desirability:

$$D = \sqrt[n]{d_1 \times d_2 \times d_3 \times \cdots \times d_i \times \cdots \times d_n} \tag{10}$$

The generalized indicator of this type allows, firstly, to use the same scale of preference (see Table 4); secondly, "discard" the solution variant from the set of alternatives, if at least one of its particular parameters (non-economic characteristics) does not satisfy the strict requirements of the researcher (i.e., $d_i = 0$).

2. Method of rationing (Kharisova, Puryaev, & IOP, 2014). Applied in the 1 case out of 45 (in 41 of the studied sources). This method transfers different in physical essence non-economic parameters (indicators) to the function of desirability Harrington in the following way.

Non-economic indicators are transferred into a comparable form, i.e. in dimensionless units. It is proposed to determine the coefficient of significance (weight) of each indicator with the help of expert assessments. In addition to expert assessments, it is also possible to use the Fishburn formula for cases when indicators can be ranked only by their degree of importance: "not significant", "significant", etc .:

$$\alpha_i = \frac{(n-i+1)}{n \times (n+1)} \tag{11}$$

where α_i is the coefficient of significance of indicators of i category; n is the categories' number of innovative projects' efficiency indicators; i is the number of the particular category.

Then, estimates of each indicator are calculated according to the following formulas:

$$S_{ij} = \frac{SF_{ij}}{S_{maxij}} \tag{12}$$

where SF_{ij} – actual i-value for j project; S_{maxij}– maximum possible value of i-indicator for j project, if there is needed growth of i-indicator.

$$S_{ij} = \frac{S_{minij}}{SF_{ij}} \tag{13}$$

where SF_{ij}– actual i-value for j project; S_{minij} – minimum possible value of i-indicator for j project, if there is needed reduction of i-indicator.

Thus, the synthetic (final) indicator of the j-project is determined by the formula:

$$S_j = \sum_{i=1}^{n} \alpha_i \times s_{ij} \tag{14}$$

where S_j is synthetic indicator of the j-project; α_i - coefficient of significance (weighting) of i-category indicators; s_{ij} – estimates of i-indicator of the j-project.

The value of the synthetic indicator lie in the interval from 0 to 1. The closer the value of the synthetic indicator to 1, the more preferable the project, i.e. such a project is optimal. The advantage of the method is that for accounting of non-economic indicators the method of weighted average valuation is used. Disadvantage: the Fishburn formula greatly simplifies the determination of weighting coefficients, but the obtained value does not reflect the opinion of the decision maker.

Integral indicator method (Bersten & Egorova, 2007). Used in the 1 case out of 45 (in 41 of the studied sources). The essence of the method of assessing the environmental performance of the organizational structure of an industrial enterprise consists in transferring individual indicators into a normalized scale, determining the weighting (significance) coefficients of these normalized indicators (by an expert method) and determining the integral indicator within the group as a weighted average, and integrating the value of all groups in the enterprise as an average geometric. Below are the formulas for calculating (Bersten & Egorova, 2007):

$$K_i = \frac{I_i}{I}$$ (15)

K_i is a normalized value of the private *i*-indicator (parameter); I_i – value of private *i*-indicator (parameter); I – value of the overall indicator. величина общего показателя.

$$K_{gj} = \sum_{i=1}^{n} K_i \times k_{wi}$$, (16)

K_{gj} is the integral indicator of the *j*-group of parameters; k_{wi} – weight coefficient of the private *i*-indicator (parameter); *n* – number of parameters in the group.

$$K_{ee} = \sqrt[m]{K_{g1} \times K_{g2} \times \cdots \times K_{gj} \times \cdots K_{gm}}$$ (17)

K_{ee} – integral indicator of the environmental performance of an industrial enterprise;
m is the number of groups of parameters taken into account in the assessment of environmental performance.

The method is simple and understandable. It is not specified how exactly the determination of weight coefficients will be carried out, but this does not detract from the method and the relevance of its use to solve the problem. Unambiguously, this method allows taking into account non-economic parameters that are different in physical nature when evaluating the effectiveness.

3. Weighted scoring method (ranking) (Bardahanova, 2012). This method is used and recommended in 2 cases out of 45 (in 41 of the studied sources). This method is similar to that presented in the source (Bersten & Egorova, 2007), but is more simplified. Its difference is that it does not use the mechanism of transfer to the normalized scale. All the environmental criteria are evaluated in the form of points, evaluated by an expert method. Thus, there appears a ranked number of investment projects. A similar approach of scoring and ranking is proposed to be used for ranking projects in the work of B.F.Noble (Noble et al., 2012). The disadvantage of this method may occur when determining weight coefficients depending on the chosen method (either a significant prevalence of subjective assessments or the use of mathematical weighting estimates). Both methods have the right to be used, but in a certain context there may be preferences for one or another method.

4. Indicator evaluation method (Grachev & Plyamina, 2017; Grachev, Plyamina, & V.A, 2016). This method is applied in 2 cases out of 45 (in 41 studied sources). The essence of the method lies in the assignment of points to the factors that affect the environment (by expert or accounting methods). A 10 point scale is used. 10 points is the most harmful influence (in actual terms) and 0 points – the absence of influence. The following data is used to evaluate indicators of environmental performance: natural value, specific value, indexed (relative) data,

aggregated data and weighted value. The system of indicators for assessing environmental efficiency consists of the following indicators assessment of the value of the effective dose of radiation (criterion of nuclear and radiation safety); indicators for assessing the health status of the population (social criterion); indicators for assessing the state of the atmosphere, the aquatic environment and the soil (ecological criterion); indicators for assessing prevented damage to the environment (environmental damage), incl. losses (social and economic) and environmental harm (economic criterion). Then, there goes the process of formation of a total integrated indicator of impact on environment. The higher this indicator, the stronger is the impact and, as a result, option is the less preferred. A similar indicator assessment of the environmental impact was made by the authors when comparing alternative methods of generating electricity (Grachev & Plyamina, 2017). It is not entirely clear from these works how the indicators are weighed when they are summarized into a comprehensive complex indicator of environmental impact. Therefore, there may appear the same shortcomings as in previous works (Bardahanova, 2012; Noble et al., 2012).

Thus, having considered the methods and mathematical tools for evaluating the effectiveness of investment projects in terms of accounting for non-economic characteristics (parameters) it is necessary to divide the evaluation parameters into two classification groups. The first group will include non-economic indicators, parameters that can be unambiguously quantified in terms of value with a high degree of probability, and therefore, they would be taken into account in the payment streams of the evaluated project. Let such a group be called in our study *a group of easily formalized non-economic characteristics (parameters, indicators).*

The second group of non-economic characteristics will include parameters, indicators that cannot be unambiguously assessed in terms of value. They cannot be quantified and taken into account in the assessment without the use of special methods, tools for transfer to normalized and (or) point scales. In our study, such a group will be called a group of *difficult formalized non-economic characteristics (parameters, indicators).* Here we have to use the existing tools, methodology or it is necessary to improve or develop a new tool for combining cost and normalized assessment, in order to make an unambiguous sound conclusion.

4. Results and Discussion

4.1. Research Statistics

So, the study of literature sources of the foreign Web of Science Core Collection database and the Russian RSCI database on the subject of research allows us to single out the following mathematical methods and their application frequency in evaluating the effectiveness of investment projects (see Table 5):

Table 5. Frequency and percentage of application of certain mathematical tooling to take into account non-economic characteristics when evaluating the effectiveness of investment projects

№№	Mathematical methods and tools	Mathematical methods and tools	Total cases	Percentage, %
1	Method of valuation of changes in macroeconomic indicators (*"Cash flow" and cost-benefit analysis* methods (*CBA*)).	Conversion into the value scale of assessments of various indicators, parameters reflecting both positive and negative effects of project implementation (gains and losses).	22	49
2	Method of multi-criteria optimization based on the use of the Monte Carlo method and data matching	A tool for solving a discrete multicriteria optimization problem at the stage of determining weight coefficients for each decision criterion.	1	2,2

3	Energy balance calculation method.	Calculation of *ROI* energy.	1	2,2
4	Methods for assessing risk and uncertainty:		8	17,9
4.1	*Scenario method (theory of games with "nature")*	Elimination of the uncertainty of investment projects' impact (IP) on the surrounding areas of activity; IP ranking.	*4*	*9*
4.2	*Risk adjustment in the discount rate*	When calculating the *NPV* of a project, the overestimated value of the discount rate (*R*) for unexpected circumstances is assumed.	*1*	*2,2*
4.3	*Risk assessment matrix method*	Matrix of qualitative risk description, risk identification. Matrix of quantitative risk assessment and implementation of gradation.	*3*	*6,7*
5	Methods of fuzzy (vague) sets		4	8.8
5.1	*TOPSIS method in combination with linguistic neutrosophic numbers (LNN)*	The method of establishing preferences in the likeness of the ideal solution when calculating the weight model. The high uncertainty of the human nature is eliminated. Ranking of risk factors.	*1*	*2,2*
5.2	*AHP- fuzzy comprehensive evaluation method*	The method of analyzing hierarchies and fuzzy complex assessment in conditions of high uncertainty. The method of pairwise comparisons in establishing the weight coefficients.	*1*	*2,2*
5.3	*TFIEOWA operator's method*	A triangular fuzzy induced Einstein operator with weighted averaging in assessing the risk of an investment project based on investor's mood.	*1*	*2,2*
5.4	*Efficiency criteria in the scales of fuzzy sets theory in the form of linguistic variable*	Effectiveness criteria are formulated in terms of fuzzy sets. Linguistic variables are used with their term-sets. More adequate reality assessment.	*1*	*2,2*
6	Methods of the aggregation theory (generalization)		9	19,9
6.1	*Desirability function method by Harrington*	The Harrington's desirability function transfers parameters different in physical essence into a single dimensionless scale according to given constraints. The method determines the generalized desirability function, which is used as an evaluation criterion (choice). A purely valuation approach is eliminated using "resultant".	*3*	*6,7*
6.2	*The method of valuation and the integral indicator (except for the function of desirability)*	Non-economic indicators are converted into dimensionless units by the valuation method. The summarizing criterion is formed as	*2*	*4,4*

		a weighted average and (or) weighted geometric mean. It is necessary to calculate weight coefficients.		
6.3	*Weighted scoring method (ranking)*	Non-economic parameters are estimated by an expert method in the form of points. There is formed ranked number of projects using weighting factors without transferring to the normalized scale.	*2*	*4,4*
6.4	*Indicator evaluation method*	The factors that affect the environment are assigned points. The weighting factors and the total complex indicator of impact (evaluation criterion) are calculated.	*2*	*4,4*
7	Cases in total		45	100

Source: compiled by the authors

4.2. Recommendations for taking into account non-economic characteristics in evaluating the effectiveness of investment projects of global and national economic significance level

So, the approach of considering easily formalized non-economic characteristics becomes obvious. The *CBA* and the *Cash flow* methods allow to take into account the non-economic characteristics quantified by a particular technique in the net cash flow. It is recommended to include parameters that can be converted into a value scale to easily formalized evaluation ones with the help of the available techniques. There should be high probability of such an unambiguous transfer. For example, there can be applied ("Method of determining prevented environmental damage," 1999), for accounting prevented environmental damage, which is associated with the implementation of an investment project, an appropriate methodology, where the valuation methods of possible consequences are clearly defined, for instance, if the project was not implemented.

Projects of global and national economic significance level allow to obtain a multiplicative effect in the related fields and in the economy as a whole. This effect can be both negative and positive or also it may contain both sides at the same time. Considering the fact that the *CBA* method is substantially developed and it is often used in evaluating the effectiveness and feasibility of projects being implemented, it can be assumed that there will be ways, methods and techniques for unambiguously transferring non-economic characteristics to the value scale with a high degree of probability. In order to choose or develop such an unambiguous translation method and to avoid disagreements in the selection process, it is necessary to clarify the notion of a "high degree of probability" for our case (the case of taking into account non-economic characteristics in assessing the effectiveness of a project in the value scale). From our point of view, under a high degree of probability should be understood the following ("Method of determining prevented environmental damage," 1999):

1. The possibility of using ready-made officially approved techniques of translation, for example, "Techniques for determining prevented environmental damage", where models for converting prevented environmental damage value into a value scale are presented and justified.
2. It has been established that there will be a strictly defined nature of the functional dependence of costs on performance (mostly linear). This requires a large statistical base.
3. There is no difficulty in accounting for costs and effects distributed in time.

4. There is an ability of bringing into comparable identity when comparing several alternatives and choosing the best project.
5. There is no other uncertainty, causing doubts about the adequacy of the performance assessment, taking into account non-economic characteristics.

It should be noted that according to the statistics of the materials studied by us, then the described method of accounting for non-economic parameters in the evaluation of efficiency accounts for 49% (22 cases out of 45). Especially easily formalized non-economic parameters can be estimated using the of *CBA*, *Cash flow* methods and others. At the same time, 51% of the studied materials and articles allow us to conclude unequivocally that economic methods for accounting for non-economic characteristics in evaluating the effectiveness of investment projects cannot be dominant or even viable. Since most of the characteristics cannot be definitely with a high degree of probability (observing the conditions introduced above) transferred to the value scale of assessment. Thus, researchers use here another arsenal of mathematical tools in accounting for non-economic characteristics when evaluating the effectiveness of investments. A detailed analysis of these methods (14 mathematical tools) was carried out in the "Research" section of this article.

We can conclude that after examining the analyzed sources for the use of a mathematical toolkit, we recommend to apply : standardized scales; weight coefficients of normalized values (in the case of linear weighting); the representation of the value of the private estimation parameters in the form of fuzzy sets (linguistic variables) and integral (generalized) evaluation criterion in the process of evaluating the effectiveness of investment projects taking into account non-economic characteristics. This is necessary when taking into account assessment parameters difficult to formalize.

An important factor in the necessity to integrate everything in one quantitative calculation criterion is the fact that today information technologies occupy leading positions in all areas of activity, including in valuation activities. The speed of the introduction of innovative projects, the tight deadlines of absorption become the key factors for the development of a country or region economy. It is apparent that making a quick adequate management decision taking into account non-economic characteristics, the formalization, creation and implementation of mathematical assessment tools based on an integral criterion is extremely important.

4.3. Mathematical tooling for accounting non-economic characteristics difficultly formalized in evaluating investment projects effectiveness

We propose to use the Harrington desirability function method and fuzzy sets theory for taking into account difficultly formalized non-economic characteristics in assessing the effectiveness of investment projects of global and national economic importance. The scope of their application also extends to the accounting of parameters that are easily formalized in the value scale. The aggregation method in the form of the Harrington desirability function method (formulas (3) - (10)) allows to transfer all possible assessment parameters into a single dimensionless scale of desirability (normalized scale) if there are given the constraints and (or) desirable levels of the decision maker. The method allows to calculate the generalized desirability function of Harrington (see formula (10)), which is an integral evaluation criterion. There is a requirement : the presence of specified constraints of the decision maker. Restrictions are strict and (or) desirable levels according to one or another characteristics can be set: in the form of clear numbers; in the form of fuzzy sets (linguistic variables).

In the first case, the transferring mechanism is used:

$$Y \rightarrow Y' \rightarrow d \qquad (18)$$

where Y is a numerical system with value of non-economic characteristics; Y' is a numerical system with intermediate normalized characteristic values, which are calculated by formulas (4), (5), (6) and (9) depending on the type of constraint (upper, lower or upper and lower); d is the function of Harrington desirability, calculated by formulas (3) and (8) depending on the type of restrictions.

The generalized integral evaluation criterion is determined by formula (10) as the geometric mean.
In the second case, the transferring mechanism is used in the form:

$$Y \rightarrow d \tag{19}$$

At the same time, all desirability of intermediate values of the linguistic variable "Non-Economic Characteristics" (hereinafter LV "NEC") can be determined either graphically (less accurately) by drawing a perpendicular line passing through the corresponding value to the intersection with the obtained desirability scale (see figure: value 30% , 47%, 55%), or analytically by the following formula:

$$d_X = d_{p1} \times \mu_{X1} + d_{p2} \times \mu_{X2} \tag{20}$$

where d_X is desirability of a calculated value from a universal linguistic variable set (LV); d_{p1}, d_{p2} - the desirability of the "threshold", "critical" values of the 1st and 2nd terms respectively, to which the value of the characteristic X belongs (with a certain value of the membership function); μ_{X1}, μ_{X2} – values of the membership functions of the 1st and 2nd terms respectively, for the X value.

The integral evaluation criterion is also determined by formula (8) as a geometric mean. This criterion allows to "throw back" a version of the project that does not comply with the strict limitation of at least one characteristic (parameter).
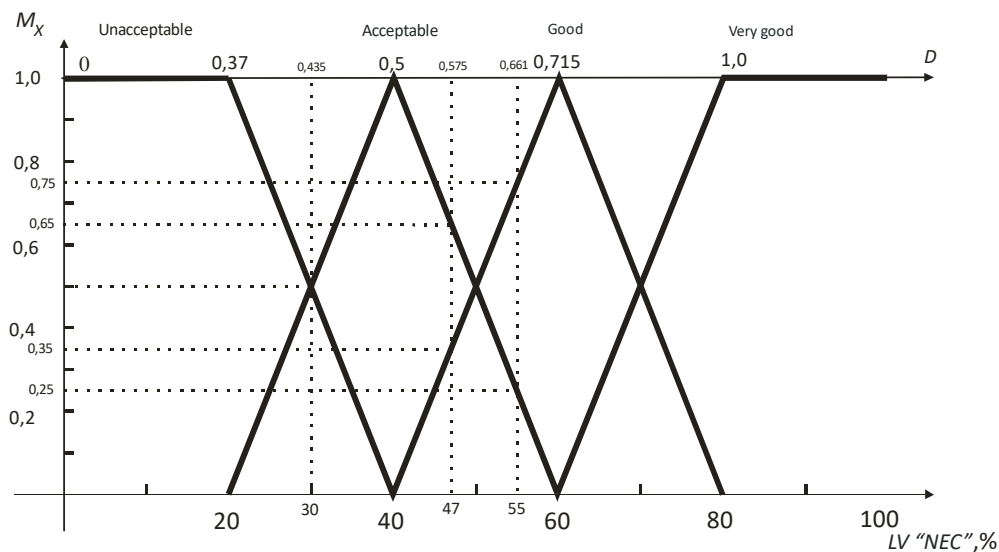
Fig.1. *Nomogram of transferring values of the linguistic variable of non-economic characteristics (LV "NEC") into the value of the desirability function (conditional example)*

Source: compiled by the authors

This approach of accounting non-economic characteristics on a conditional or real valuation example should be considered in more detail. But for this, firstly, it is necessary to develop a mandatory set of non-economic characteristics for evaluating projects of global and national economic importance. Secondly, to prescribe a clear sequence of actions of the decision maker, i.e. evaluation method. And only then make an assessment in strict accordance with the prescribed method on a real or conditional example.

In the case when the weighted average value (the result of a linear resultant) is used as an integral evaluation criterion, then it is important to calculate the coefficients of significance (weight) of each estimated non-economic indicator (parameter). The analysis of the above-mentioned methods showed that to determine weight coefficients under conditions of high uncertainty, it is desirable to apply: an expert method with subsequent elimination of uncertainty using the *Monte Carlo* method; *AHP* method, which allows to reduce the subjectivity of the expert method of establishing weight coefficients, because a special evaluation scale for comparing alternatives is used; Technique for Order of Preference by Similarity to Ideal Solution (*TOPSIS*), which makes it possible to rank risk factors in the implementation of an investment project and to develop weighting factors for these factors.

Also of particular interest is the *AHP* method in solving the problem of choosing the optimal solution (for example, of an investment project) from the set of existing alternatives. But there is a limitation: a comparison is necessary, i.e. at least two project options are required.

Conclusion

So, the research showed:

1. The necessity to separate evaluation parameters into two classification groups. The first group will include non-economic indicators, parameters that can be unambiguously quantified in terms of value with a high degree of probability. Such a group of non-economic indicators is named by us as easily formalized characteristics. They can be taken into account by established traditional methods in the payment flows in the value scale. Criteria have been established for classifying methods for taking into account non-economic characteristics as those that with a high degree of probability can do this in the value (money) scale.
2. The second group of non-economic parameters taken into account is called difficult to formalize in the value scale, since they cannot be evaluated without preliminary procedures for transfer to the normalized scale, take into account in assessing the effectiveness of the investment project. There is also noted the importance of developing mandatory parameters that are difficult to formalize, which must be taken into account when evaluating the effectiveness and feasibility of investment projects of global and national economic importance.
3. Also, it was revealed that 51% of the considered cases of the use of mathematical tooling in evaluating the effectiveness of investment projects do not refer to value methods. This fact emphasizes the relevance and the need to apply assessment methods that allow to take into account and compare characteristics that are different in their physical nature when evaluating the effectiveness of projects, to make sound conclusions and to make reliable management decisions. In the application of particular interest are the methods of the theory of aggregation (19.9%), methods for estimating risk and uncertainty (17.9%), and methods of the theory of fuzzy sets (8.8%).
4. It is proposed to use the Harrington desirability function method as a universal method of generalizing and forming an integral evaluation criterion (and other analyzed integral evaluation criteria can also be used) to take into account non-economic characteristics in evaluating the effectiveness of investment projects of global and national economic significance. To eliminate the uncertainty in the evaluation conditions, it is proposed to use fuzzy sets in setting restrictions on the estimated characteristics. The methods of *AHP* and *TOPSIS* will be adequate for determining the weights (if necessary).

5. The next stage of the research is the development of a mandatory set of non-economic characteristics that are necessary to use when evaluating the effectiveness of investment projects of global and national economic importance.

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ORGANIZATIONAL AND METHODOLOGICAL SUPPORT OF CORPORATE SELF-ASSESSMENT PROCEDURE AS A BASIS FOR SUSTAINABLE BUSINESS DEVELOPMENT

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Abstract. Complicated, diverse, multidirectional institutional processes, taking place around the world, have led to the fact, that in modern conditions the priority direction for disclosing of information about the reporting entity activities to its stakeholders is corporate integrated reporting. It is increasingly acting as a new effective management tool that provides the necessary information connectivity and completeness of disclosure of information on sustainable business development. The article is devoted to one of the effective methods used in the preparation of integrated corporate reporting: internal self-assessment of the organization. The authors substantiate the need for internal self-assessment in order to prepare integrated corporate reporting; made proposals for the development of methods of the organization self-assessment; formed several proposals to improve the organizational and methodological support of the procedure of its implementation; disclosed the main content of the stages of internal self-assessment of the organization. The peculiarity of the proposed methodological solution is the focus on in-depth analysis of the existing business model, the assessment of the contribution of all types of capitals to the result of the organization, taking into account the features of the internal and external environment and industry specifics. The practical application of the proposed methodology as one of the tools of corporate governance allows to increase the level of standardization of integrated reporting and to ensure optimal management of financial and non-financial information flows.

Keywords: integrated corporate reporting; self-assessment; capital; information; stakeholders

1. Introduction

Domestic and international experience in the integrated corporate reporting formation shows that Russian scientists constantly face with a number of conceptual issues and problems in the development of relevant methodological materials and the attempt of their practical application: the lack of complex necessary information, both in open sources and in the accounting systems of organizations, the lack of data and statistics in the needful analytical context, the use of complex indicators, the inability of accounting system to provide relevant non-financial information, etc.

In this regard, despite the high need for high-quality methodological developments in the field of organizational and methodological support for the integrated corporate reporting preparation, there is a noticeable lack of them. The recommendations of the international integrated reporting standards discussed earlier are of a rather general approach. At the same time, it is obvious that these recommendations can serve as the necessary theoretical and methodological basis for the relevant developments (Korableva et al., 2018; Hilkevics, Semakina, 2019).

The proposed methodological approach is aimed at creating an effective mechanism for the preparation of initial information to create integrated corporate reporting. Initial methodological assumption is the recognition that the existing accounting and information system of domestic organizations in the real sector of the economy is focused primarily on the collection and presentation of value information and therefore is not well suited for non-financial information in the formats required for submission in non-financial reporting (Dunets et al., 2019; Chernysheva et al., 2019; Nikolaeva et al., 2018; Goryushkina et al., 2018). At the same time, the creation of a separate service dealing exclusively with this issue is often impractical due to the costs increase of collecting and processing the necessary information, a significant part of which is usually formed by various departments and organizations which are combined into business. Under these conditions, an orderly, albeit distributed, mechanism for collecting information through internal self-assessment could be a possible solution.

2. Literature review

Despite the development of an international standard for integrated reporting, in Russian practice "the methodology and technology of forming these reports are still in the approbation stage" (Druzhilovskaya, 2015), fundamental work in the field of forming and preparing corporate integrated reporting and a complete objective study of its analytical capacity is not enough.

Many well-known domestic scientists are actively involved in this problem, revealing the purpose, nature and content, principles of the requirements for information disclosure. Vakhrushina (2014) believes that "an integrated report should disclose the nature of the impact of management on six types of company capital (financial, production, human, intellectual, natural and social)" (Vakhrushina, 2014). At the same time, the information of the integrated report should contain the analysis of the "quality of the organization's relations with its main stakeholders", considering their legitimate interests and expectations (Getman, 2014).

To determine the composition of the integrated reporting Kogdenko and Melnik (2014) compare traditional and integrated reporting, revealing the directions of "its transformation into a data system that aggregates key indicators for making management decisions" (Kogdenko and Melnik, 2014). Basing on the concept of "integrated thinking", Malinovskaya (2013) defines, as part of corporate integrated reporting, "the interrelation of financial and management reporting, reports on corporate governance and remuneration, and reports on sustainable development".

A wide discussion has been given to content issues, which are connected with the integration of data of already existing types of accounting, as well as with the mechanism for creating a new type of business accounting, which

should become a "motivational element to confirm the correctness of the decisions taken by financial capital providers when allocating resources and reflecting the results of value creation in integrated reporting" (Plotnikov and Plotnikova, 2014). Meanwhile, "the integration process, like any economic process, must be based on the basic rules" (Sorokina, 2008), which indicates the need to improve the methodological support for creating and preparing corporate integrated reporting.

International research and development conducted under the auspices of various international organizations, such as the Association of Certified Chartered Accountants (ACCA), the World Business Council for Sustainable Development (WBCSD), International Federation of Accountants (IFAC), International Integrated Reporting Committee (IIRC), International Institute on Sustainable Development (IISD) and others, play a significant role in this area.

3. Methods

As part of the study, the analysis of domestic experience in the formation of corporate integrated reporting was done. As a research tool a systematic analysis of empirical research, the principles of formal logic, the synthesis and analysis of theoretical and practical material were used. The author's approach to conducting self-assessment presented below is based on survey materials, as well as modern methodological developments considered in the relevant standards for building a management system focused on success.

4. Results

The corporate integrated reporting is considered as a modern and effective mechanism for ensuring the transparency and openness of Russian companies. At the same time, formally, the issue of regulation of preparation and submission procedures of this reporting type is currently outside any national jurisdictions and is carried out on a voluntary basis within the framework of a broad understanding of the social responsibility and business transparency concept (Tarman and Dev, 2018).

From the point of view of the integrated corporate reporting preparation process, self-assessment can be considered simultaneously as an internal questionnaire independently conducted by responsible executives and as a comprehensive, systematically organized analysis of the current business model, taking into account the main capital involved in it. Self-assessment can provide an overview of the activities of the organization and the maturity of its management system.

Internal self-assessment should be organized in such a way that it can form a generalized (and sometimes detailed) representation of all significant elements and business segments, information about which will be presented in the integrated report.

Self-assessment can be considered both as an internal analytical tool and as a kind of mechanism to replace the technique of continuous uninterrupted registration of objects and operations in traditional accounting registers. If properly designed, the self-assessment system can provide the necessary level of completeness and reliability of the information presented in it, considering the requirements for the level of corporate transparency and disclosure. Therefore, General approaches that define the basic requirements for any business transparency systems, in particular, can be fully used in relation to it:

- focus on information, either contained in the management system, or obtained on its basis using techniques of financial and statistical analysis and modeling;
- focus on the information needs of key stakeholders. Self-assessment procedures should be carried out in such a way that on its basis formed "exactly the information that users need, in a convenient form";

- reliability, accuracy and completeness of the information received, which should provide internal and external users with the opportunity to correctly and timely assess the economic, environmental, social, etc. aspects of business activities, its opportunities for sustainable development and prospects for creating additional economic value in the future;
- balance of costs and benefits from creating a self-assessment system, balancing risks and opportunities when using the information contained in it. That is, business management should be well aware and able to balance the potential benefits of increasing transparency and the costs and losses associated with them.

The main goal of such a self-assessment is to achieve a comprehensive vision of the main internal processes, understanding how the selected business model is implemented on their basis. The business model, as an object of self-assessment, is logically considered through the types of capital involved in its implementation. A brief description of the main elements of each capital subject to the self-assessment procedure is given in Table 1.

Table 1. Evaluation of the impact of key types of capital on the business model (Bochkareva & Prodanova, 2018).

Type of capital	Studied elements	Characteristics of the research results
Financial	Sources of financing (strategic and current)); Funding directions; Financing risks; Cost of capital for the business; Investment; Information about future investment projects.	Assessment of self-financing capacity, financing potential taking into account long-term plans; Assessment of risks associated with financing activities and effectiveness of measures to reduce them; Assessment of the prospects for growth of business value.
Production	Description of fixed assets by groups and categories; Description of infrastructure facilities; Production process organization; Purchasing system and supply chain organization; Marketing, sales policy and organization of sales and distribution chains.	Assessment of production and technical potential; Assessment of production capabilities in terms of sustainable growth; Assessment of the effectiveness of material support of production processes; Assessment of sales opportunities.
Intellectual	The quantity and value of copyright, licenses, patents, know-how and other types of intangible assets; Investments in research and development, the acquisition of new intangible assets; The presence of intellectual infrastructure (business architecture, knowledge bases, internal networks); Availability of descriptions of business processes and their configuration; Personnel composition and average number of employees by units and segments; Expenses for advanced training and additional education of employees, their acquisition of special knowledge; Motivational programs and labour productivity programs.	Assessment of the potential for creating added value based on existing intangible assets; Analysis of potential returns on future investments in intangible assets; Assessment of the professional and educational level of employees; Assessment of staff experience and ability to perform work; Technical and methodological equipment of labour; Assessment of the contribution of employees to achieving the intended results.
Natural	Used raw materials and consumed natural resources; The use of various types of renewable and non-renewable resources; The impact of business on the environment; Costs on the environment; restoration of the environment; Costs of energy and resource conservation.	Assessment of limitations and opportunities for the use of natural resources and raw materials; Risks and opportunities of the current business model within the framework of existing natural ecosystems; Assessment of the environmental impact of production activities.

Social	Analysis of the system of relations with interested users of reporting information; Expenses for social infrastructure; Amount of remuneration and other payments to employees; Costs of creating collaborative technologies; involvement of vertical supply chains; Costs of social investments, sponsorship, charity; The costs of creating a public image and ensuring the openness of the business (presence on social networks, interaction with the media, communication with the public, etc.).	Assessment of the potential impact of interested users of reporting information on a business; Assessment of the effect of social investments, sponsorship and charity in the regions where the business is present; Assessment of the contribution of social (relative) capital to business results.

Source: own research

Self-assessment should coincide with the specific activities of a organization, giving a complete, clear, accurate representation of all components of capital involved in the business. In addition, it may include issues of quality assurance of corporate governance in such key areas as:

- rights of shareholders and investors;
- activities of the Board of Directors;
- corporate governance and internal control systems;
- actions aimed at disclosure of information and increase of information transparency of business;
- corporate social responsibility and compliance with business ethics;
- compliance in all key areas of activity, etc. (Bochkareva & Prodanova, 2018).

In the expanded form, the self-assessment methodology should contain a set of questionnaires and questionnaires presented in the form of tables. Their filling is carried out by the relevant structural organizational units. Thus, through a systematic representation of the internal and external environment of the organization as "a combination of internal and external factors and conditions that can affect the achievement of the organization's goals and its behavior towards stakeholders" provides the necessary information basis for the formation of integrated corporate reporting.

Below there are the main methods and approaches for collecting data in order to conduct self-assessment for the preparation of integrated corporate reporting. As an example, we consider a fragment related to the self-estimation of intellectual capital.

Intellectual capital is one of the key elements of the business model, through which additional added value is created in the business, exceeding its usual production capabilities (Korableva et al., 2019), according the author ntellectual capital is formed by "the potential value of the various components or flows of capital in an organization; relationships and collaborative activities that can increase the value and applicability of this potential to real business or organizational challenges".

By its nature, intellectual capital has a complex structure and usually includes three main components: intellectual property, intangible assets and corporate knowledge assets. The latter component is the least studied and almost not represented in the traditional accounting system. Recently, it became the subject of serious study in the theory and practice of accounting, therefore, the existing classification of its forming elements are heterogeneous and ambiguous. It is believed that knowledge assets may include such items as human capital, structural capital, customer capital. But it can also "include employee knowledge, information about production processes, experts, products, customers, competitors, intellectual property in the form of patents and licenses (administered by regulatory bodies to protect the public interest)."

Based on this classification, the self-assessment procedure scheme presented in figure 1 can be proposed:
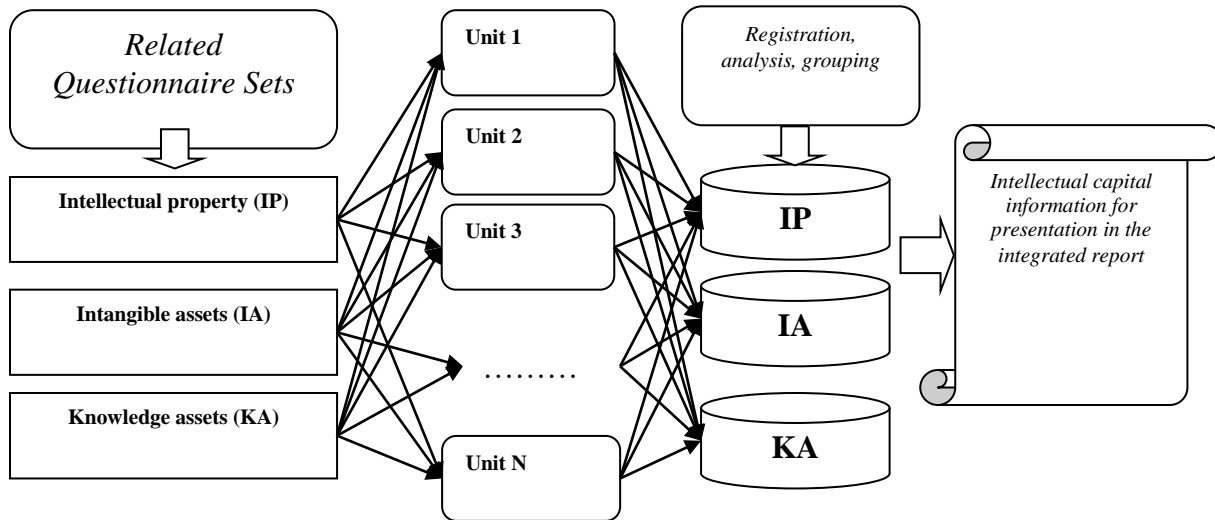
Fig. 1. Scheme of intellectual capital self-assessment procedure

Source: own research

Questionnaires of self-assessment should be formed in groups of subjects, the nature of the estimated area and units (segments) of business. We can envisage two options of the self-assessment scheme: standard and extended. The standard scheme means that the survey of business units (segments) is conducted on a common basis without distinguishing their specifics. The advantage of this approach is obvious – questionnaires are formed in a standard form, the questions are the same, the specifics can be manifested only at the level of answers. This self-assessment option may be recommended to organizations that have only started to produce integrated corporate reporting for the first time or relatively recently, and have not yet developed effective, well-established internal organizational and instrumental tools for collecting and processing relevant non-financial information in the required presentation format.

The extended scheme assumes that the survey of business units (segments) is carried out individually, considering their characteristics and information needs of internal users. In this case, the standard set of questions contained in the questionnaires can be modified by clarifying their wording, expanding or, conversely, reducing the number of items considered. Accordingly, it is possible to more fully and deeply take into account the specifics of intellectual capital, keeping in mind the nuances of its organizational, territorial, managerial structure, identifying its strengths and weaknesses, taking into account the risks and opportunities for further growth (Shatunova et al., 2019).

Such a scheme can be recommended to business, which has repeatedly formed corporate integrated reporting and, accordingly, has the necessary experience and technical capabilities to improve the mechanisms and tools for its preparation.

It should be noted that in general, the self-assessment procedure can be reduced to filling out questionnaires and their subsequent processing largely. Accordingly, this process can be organized in two ways.

The first method can be characterized by the principle of "bottom-up". It suggests that pre-formed questionnaires with approved wording of answers can be sent directly to the units being examined. The leadership of the latter, based on internal regulations and orders of higher governing bodies, independently determine how to fill them out and the persons responsible for this process. Accordingly, it is the heads of departments that are responsible for the accuracy and completeness of the information in the completed questionnaires.

The second method implements the opposite principle - "top-down", when the questionnaire is carried out by a centralized unit or by an independent working group, whose authority includes the direct organization of the self-assessment process.

The methods for conducting a self-assessment of capital are presented in Figure 2.

The functions of the working group, among other things, may include the following issues:
– identification and elimination of informational restrictions in places that impede objective, timely and full self-estimation;
– ensuring the organization consistency of the survey process with the management of the evaluated units;
– ensuring effective and rapid information exchange within the organization, not only information, but also knowledge and experience, stimulating close interaction between the performers.
Responsibility for the accuracy and completeness of the information in the completed questionnaires is more centralized here.

The discussion point is the degree of automation and formalization of the questionnaire filling process. The cost - benefit principle of obtaining information implies that the cost of obtaining information, considering the criteria of accuracy, reliability and urgency, should be reasonable (Baldacchino et al., 2019).

Accordingly, a certain part of the information can and should be generated directly in the accounting information system without the participation of people. But this implies a sufficient level of its development, the presence of good analytics and support for the required data presentation formats. Obviously, the part of the information presented in quantitative form can be obtained by resorting to modern information technologies. But rather, this will not be relevant for the first presentation of integrated corporate reporting.
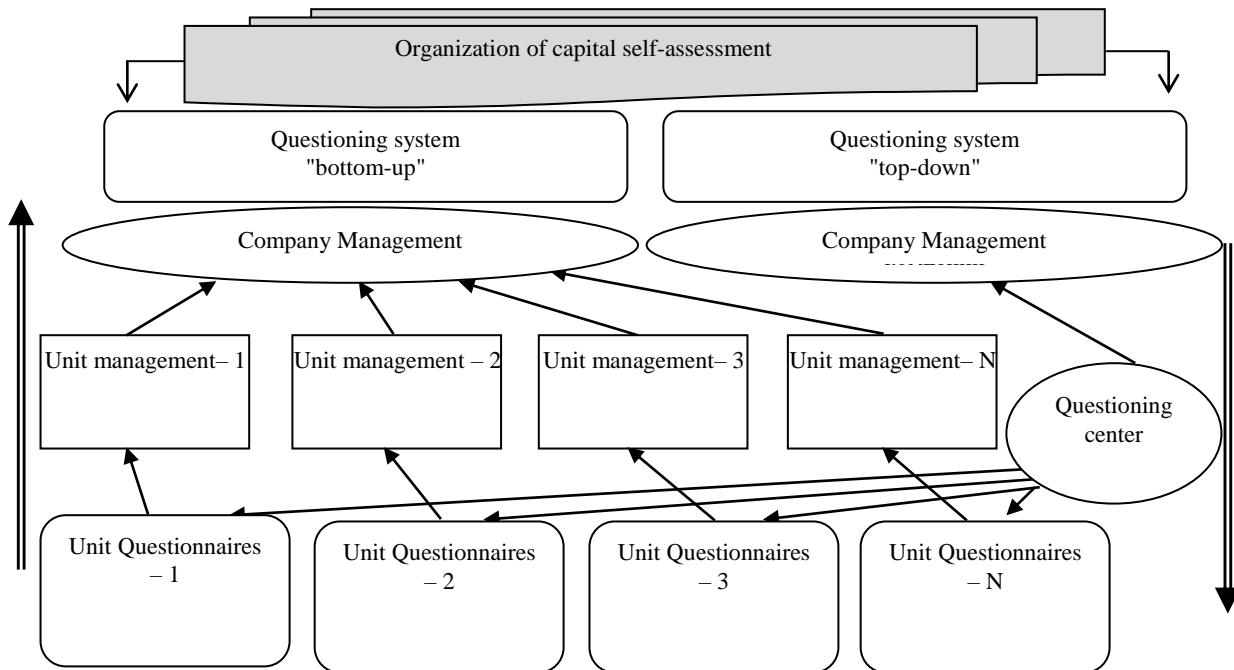
Fig. 2. Methods of organization and self-assessment of the company's capital.

Source: own research

To assess capital, the content of the questionnaires includes questions with quantitative and qualitative characteristics. In this regard, at the level of internal methodological developments it is advisable to distinguish between quantitative and qualitative information.

Particularly, in terms of intellectual capital, quantitative indicators can characterize: the share of labour protection and safety expenses; job growth; injury rate, etc.

Qualitative indicators characterize the presence of career and professional development programs; correspondence between the declared and real working conditions, the implementation (non-fulfillment) of the plan of professional development in the current period, etc.

Examples of qualitative and quantitative indicators, as well as related issues, are given in table 2.

Table 2. Qualitative and quantitative indicators of intellectual capital evaluation of in terms of assessing the level of professional competence of the staff of the organization
(Bochkareva & Prodanova, 2018).

Indicators	Description	Presentation method in the questionnaire
Quantitative indicators		
Labour protection and safety expenses share	$\dfrac{\text{Labour protection and safety expenses}}{\text{Total expenses}}$	Calculated, automated
Percentage of company employees who completed professional training (retraining, advanced training) during the year	$\dfrac{\text{Number of employees completed skills training}}{\text{Average staff employed}}$	Calculated, automated
Coefficient of occupational injuries, in terms of 1 million hours worked	$\dfrac{\text{Number of occupational injuries}}{1\,000\,000}$	Calculated, automated
Job growth rate	$\dfrac{\text{Number of new working positions}}{\text{Number of working positions in total}}$	Calculated, automated
Share of young professionals in the total number of employees	$\dfrac{\text{Number of young professionals}}{\text{Average staff employed}}$	Calculated, automated
Qualitative indicators		
Employee satisfaction with working conditions	Are the working conditions defined in the employment contract, collective agreement Is there a correspondence between the declared and real working conditions Presence of complaints of workers on non-compliance with requirements to working conditions Existence of certificates of compliance with technical and sanitary standards for workplaces Availability of comments during internal and external audits	Informal, personal survey
Effectiveness of measures to improve the skills of employees	• Implementation (non-fulfillment) of the continuing education plan • The presence of self-training programs for workers and conditions for their implementation • Availability of career and professional development programs	Informal, personal survey

Source: own research

Self-assessment should not only help to identify general facts and patterns in the information collected, but also contribute to a better understanding by the staff of the importance of its role in the organization's activities, an objective evaluation of individual contribution to the creation of economic added value.

Based on the results of the self-assessment, additional measures can be taken aimed at solving such problems as:

– organization of processes for the knowledge and experience exchange, advanced training, building programs to

introduce proposals for improving production processes and improving product quality;
– improvement of systems of material remuneration and non-material incentives, considering the individual contribution of the employee and his personal achievements;
– creation of a system of career growth, planned staff rotation in order to stimulate personal development and improve professional competence of employees;
– development of corporate mentoring and training programs for young professionals, etc.

6. Discussion

In the future, the role of the proposed methodology for self-assessment for management purposes can be much wider, because its information content can be used for analysis of sustainable development or improving the overall quality of management, identify areas in need of improvement, the formation of strategic priorities and prioritization of the implementation of certain management actions or decisions.
In addition, in order to enhance the overall information and analytical effect, the full self-assessment methodology may include additional tools for internal process analysis and business results estimation with respect to the selected benchmark (benchmarking). As a result, the organization is able to make qualitative and quantitative comparative assessments with other organizations in order to better understand its market positions, as well as to monitor changes over a certain period of time in terms of achieving the planned strategic goals and forming new strategic guidelines.

7. Conclusions

The organization should use self-assessment to identify opportunities for improvement and innovation, set priorities and develop action plans for sustainable success. The results of the self-assessment show the strengths and weaknesses of the business, its maturity level and life cycle stage. Thanks to them, there is additional valuable information not only for business analysis, but also for staff training in order to properly represent his understanding of the existing business model and the potential for value creation.
The proposed method of self-assessment, according to the authors, should be considered not so much as a mechanism for creating an additional accounting system, alternative to the existing one, but as a management tool that gives us opportunity to optimally manage and effectively use the flow of non-financial information.

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AGRO-INDUSTRIAL CLUSTER: SUPPORTING THE FOOD SECURITY OF THE DEVELOPING MARKET ECONOMY

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Abstract. The article examines the mechanism for the creation and implementation of an agro-industrial cluster in the form of a rural municipal formation, which is an average population center, whose inhabitants are engaged in agriculture and ensure the functioning of its social infrastructure. At the same time, the said cluster is a combination of a system of production, primary processing, storage and marketing of agricultural products and a system of social infrastructure that ensures the quality of life of its residents, comparable to the urban one. Within the framework of practical research, several measures for the integrated development of rural areas are proposed, taking into account the assessment of the level of social and economic development of agriculture in the territories of the constituent entities of the Russian Federation and public policy instruments that influence their development. The assessment of the agriculture development was carried out using the methods of descriptive statistics based on the Gatev coefficient, and also by conducting a cluster analysis based on the application of the package of applied programs "Statistica". These allowed to formulate and propose a concept for rural settlements of a new type that correspond to the current trends in the territorial development of the developing market economy that meet the requirements for ensuring the state's food security. At the same time, mechanisms proposed are aimed at the integrated development of rural settlements, and in particular, include the involvement of additional budgetary funds and adjusting the tax policy for agricultural producers.

Keywords: national food security; developing agricultural market; economy of agriculture; tax policy of agricultural producers

1. Introduction

One third of the developing country economy branches is related with the agro-industrial complex. According to expert estimates, the creation of one workplace in the agricultural sector allows employment of 5-6 people in other spheres of the economy, and the growth of agricultural production by 1% ensures the growth of the entire economy by 2.0-2.3% (Bonanno, et al. 2019). At the same time, the agriculture occupies a special position in market conditions, which does not allow full participation in inter-industry competition. The reason is that agricultural sector is falling behind in comparison with the rest sectors due to the dependence on natural factors and the seasonal (cyclical) nature of production. The return on invested capital in this area is less than in industry, but the level of agricultural production directly affects the state of the country's food security. At the same time, the agricultural sector is less adaptive than other sectors; nevertheless, its condition also depends on changes in the economic situation and technological platforms (Tarman and Acun, 2010; Shatunova et al., 2019; Goryushkina et al., 2018). Due to a complex geopolitical situation, the problem of replacing imported products with food products produced domestically (the policy of import substitution) has arisen in the current Russian economy. To successfully solve this problem, it is necessary to institutionalize import substitution, which is understood as the creation of an institutional environment that allows replacing imports of agricultural goods (works, services) with competitive domestic products that are not inferior to foreign analogues in terms of their price and consumer properties.

2. Literature review

It should be noted that almost every country has a large number of various instruments regulating the economic activities that are designed to implement protectionist policies in order to replace imported agricultural products (goods, works and services) with national (domestic) ones. Among such instruments are budget subsidies, tax benefits, price, credit and other preferences (Strasberg et al., 1999; Sharafutdinov et al., 2018; Trofimova et al., 2019; Baltgailis 2019). Taking into account that each of the abovementioned tools has advantages and disadvantages, it should be emphasized that their effectiveness depends on the institutional environment in which it operates (Tagliafierro et al., 2013; Rupeika-Apoga et al., 2018; Kuznetsova et al., 2019; Bozhkova et al., 2019; Titova et al., 2019; Sycheva et al., 2019).

At the same time, the institutionalization of import substitution should be carried out in the context of industries that are essential for ensuring the economic and food security of the state - primarily in industry and agriculture (Xiaojiao et al., 2018). Moreover, when applying a specific instrument of state support for import substitution, it is necessary to take into account the systematic nature of the import substitution process that is, taking into account the mutual influence of the measures of state financial support on the incentive subject. For example, tax methods of regulating the activities of economic entities contribute to the development of those market participants who receive tax incentives (Bodyako et al., 2019). At the same time, their wide application causes the emergence of "falling" tax revenues, thus limiting the possibility to apply budget subsidies.

In turn, price methods for regulating import substitution appear to be discriminatory in comparison with tax methods that are universal in nature. The use of price regulators can lead to restriction or elimination of competition, and does not stimulate the improvement of the quality of national products, so the application of these methods should be short-termed and accurate (Hoekman et al., 2004). Considering that the negative effect of direct import substitution is the country's withdrawal from the globalization process (the sanctions policy), the state will not be able to take advantage of the global distribution of material, labor and other resources to the proper extent (Makki et al., 2012; Dunets et al., 2019). In this regard, the financial support of the state for the production of competitive agricultural products is of particular importance.

The credit mechanisms for import substitution stimulating relate to another method of import substitution regulation. Over the past three years, the Russian Ministry of Agriculture has approved 464 investment projects for import substitution, for which over 4.2 billion US dollars will be allocated for the period up to 2020 (Ministry of Economic Development Order of 25.03. 2014 No. 155 "On the conditions for admission of goods originating from foreign countries for the purpose of procuring goods, works, and services for the provision of state and municipal needs"). About 4.1 billion US dollars will be invested in the development of vegetable growing of protected soil. The investments will also be made in the sphere of sheltered soil vegetable growing, construction of vegetable stores, processing of fruits and berries, dairy cattle. However, the credit mechanisms have practically "exhausted" their resources in conditions of high creditworthiness of agricultural commodity producers and the underdevelopment of agricultural credit cooperatives (Jeffrey et al., 2018). At the same time, credit cooperatives are very important in the world practice (e.g. in the US, the cooperative farm loan system provides farmers with at least 1/3 of the loans for land purchase and 1/6 of the volume of short- and medium-term loans (Asmi et al., 2018).

3. Theoretical background

In connection with the chronic unprofitability of a significant part of economic entities in the agricultural sector of developing countries, it appears necessary to assess the potential for reducing this indicator by minimizing the expenditure part of their budgets. This can be achieved by analyzing the structure of the cost of agricultural products. The cost price should be the total amount of current costs of commodity producers for the production and sale of products. The production cost, including all current costs for the technological process and management should be distinguished as well as the full (commercial) cost price, taking into account the costs of selling products (Jones, 2019; Goryushkina et al., 2019; Singareddy et al., 2019; Goloshchapova et al., 2018; Tarman, and Dev, 2018).

At the same time, the prime cost is the most important general performance indicator of the entrepreneurial activity, which determines the efficiency of their production and competitiveness in the internal and external markets. In comparison with sales prices, the total cost price determines the amount of profit or loss, as well as the level of profitability (Korableva et al., 2018). The cost price, according to Semeta A. (2011) is systematically determined in agricultural organizations in the process of accounting and is subject to analysis and management.

The production of agricultural products is the most risky kind of entrepreneurial activity, because along with various types of economic risks (Skryl, 2017), this sector is also characterized by risks caused by adverse natural and climatic factors. The ranking of risks based on expert assessments carried out by Guerrero, J.W.G. at all (2018), states that among the most significant risks are natural and climatic risks. The probability of occurrence of these risks and, consequently, their negative impact on the result of entrepreneurial activity in the agroindustrial complex amounts to 0.792. According to Palleto, A. et all (2015), seasonal alignment significantly affects economic efficiency in world agricultural practices, and is unevenly distributed per unit area of agricultural land. This is confirmed by statistical studies carried out using OECD statistic (Balanced International Merchandise Trade Statistics data for 20 non-OECD countries) (Figure 1).
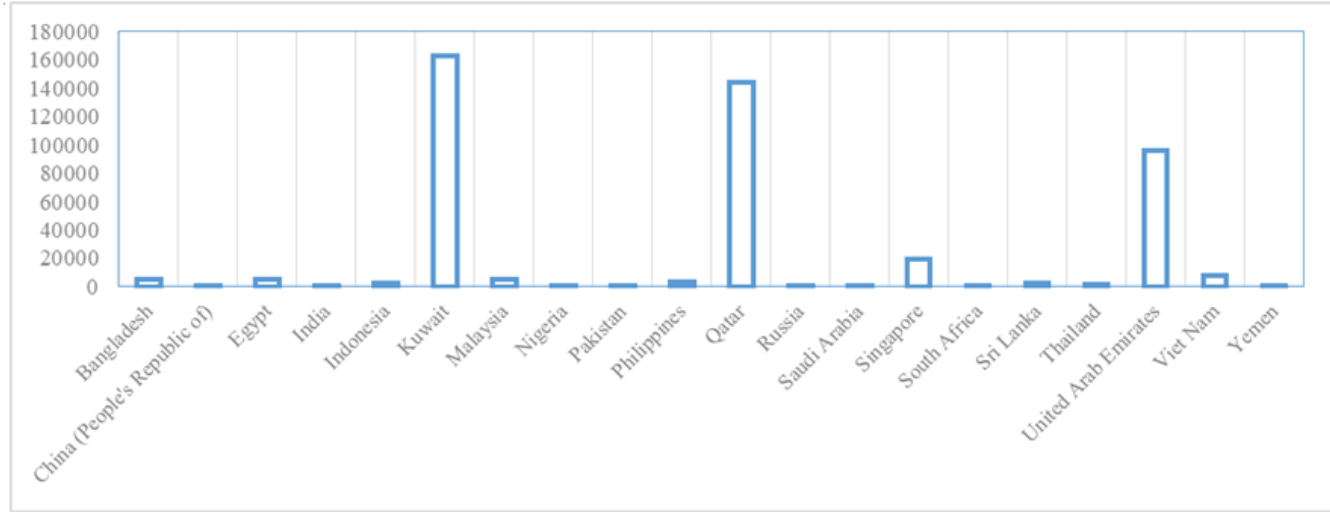
Fig. 1. The ratio of agricultural output per conditional unit of land occupied by agriculture in countries that are not members of the OECD in 2011, (shares)
Source: Balanced International Merchandise Trade Statistics (by CPA)

According to Fig. 1, the Russian Federation in terms of the ratio of agricultural output to the area of land occupied by agriculture is among the countries that are not members of the OECD with the lowest indicator. Moreover, according to the study of the dynamics of the change in the specific volume of agricultural products to the conventional unit of the area for non-OECD countries, for the period 2011-2016, Russian Federation has the smallest indicators (Figure 2).
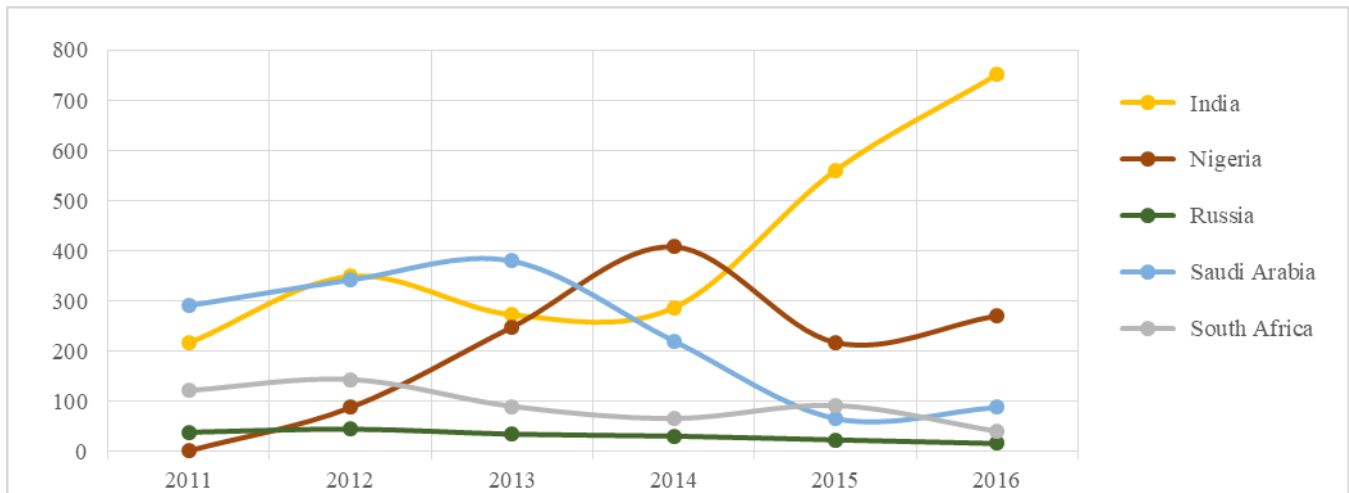
Fig. 2. Dynamics of the change in the specific volume of agricultural products to the conventional unit area for individual countries that are not members of the OECD
Source: Balanced International Merchandise Trade Statistics (by CPA)

In this case, it is possible to identify several obvious risks immanent to developing economies, and inherent exclusively in the Russian agricultural sector:

a)the risk of reducing the competitiveness of domestic agricultural products, producers of which are not able to compete on an equal footing with international agricultural producers (Hayami and Ruttan, 1970);
b)the risk of the inability to purchase innovative agricultural equipment, in order to increase production volumes;
c)risk of incorrect and untimely adaptation of Russian agricultural production to changing market conditions, a disproportionate reduction in the supply of agricultural products in accordance with the demand for it (Ivanova, et. al, 2018). At the same time, this risk can be realized in the following way: due to the natural limitedness of sown areas, Russian producers will not be able to timely increase the output of crop production in response to the increasing demand;
d)the risk of low added value of agricultural products, caused by the disparity of prices between the values of production and resources (feed, agricultural machinery, fertilizers, etc.) required for its production (Siskova J., 2015);
e)the risk of inability to attract investors to agricultural production projects due to their limited attractiveness.

When different types of risks were identified for agricultural producers after the introduction of the food embargo over the past four years, the following main problems characteristic of the Russian agricultural market were formulated. Increase in the risk of bankruptcy of agricultural producers. If an entrepreneur is faced with the inability to pay interest or the bulk of the amount of debt, then later credit institutions are less likely to agree to a concessional loan, which would serve as a basis for increasing the financial and operational sustainability of the entrepreneur. At the same time, preferential loans provided by credit organizations and agricultural credit consumer cooperatives to producers in accordance with the current state programs for the development of agriculture and the regulation of markets for agricultural products, raw materials and food for the period until 2020 can not be repaid in time for various reasons. Firstly, the agricultural products have low added value, which significantly reduces the profitability of sales, and because of this, the agricultural organization or the peasant and individual farm holdings accumulate free cash to repay loans extremely slow. Secondly, agricultural commodity producers face difficulties in the marketing of crop and livestock products, as the threshold of entry is extremely high in retail chains. Impossibility to sell the products directly causes the risk of inability to repay the loan. Thirdly, the risks arising in the conditions of the food embargo are one of the reasons for changing the legal acts related to the agricultural producers' activities in Russia.

It should be noted that the risk of agricultural producers, caused by introduction of the food embargo, is associated with a longtime process of collecting the documents required to receive subsidies and benefits for conducting business in agriculture (Voronkova et al., 2019; Prodanova et al., 2019). In particular, the Ministry of Agriculture of the Russian Federation establishes an extensive list of documents for subsidizing the percentage load in accordance with the State Program for the Development of Agriculture and the Regulation of Agricultural, Raw Materials and Food Markets for the Period up to 2020. These documents include: contracts for the sale of products plant growing and livestock, primary documents, bank documents, which confirm that agricultural producer owns the necessary sum (10% of the amount of the requested grant), as well as business - plans for the sale of agricultural products. The complexity of the procedure of preparing these documents increases the risk of making mistakes and, as a result, the risk of refusal to grant a subsidy also increases. The risks mentioned above can lead to various negative consequences, the nature of which depends on the category of farms to which the agricultural producer belongs (Bloshenko, et. al, 2017; Plaskova et al., 2017). The main problems for agricultural organizations in developing countries thus are:
a)impossibility to attract agricultural workers;
b)impossibility to acquire high-tech agricultural machinery in the short term;
c)impossibility to ensure a reduction in the price of manufactured products in a short time.
In turn, the following problems in entrepreneurial activities can emerge for peasant and individual farm holdings and individual entrepreneurs:
d)impossibility to sell their products due to high competition with larger agricultural producers;
e)impossibility to acquire high-tech agricultural machinery in the short term;

f)the need to raise the price of their products in order to cover costs in the midst of an economic crisis.

In this regard, the definition of indicators of dynamics, structure, structural shifts, trends in the development of agricultural production, modeling of agricultural production will allow to identify the features of the development of the Russian market of agricultural products and, consequently, to determine ways to minimize the risks previously considered.

4. Data analysis

The main indicator characterizing the results of entrepreneurial activity of agricultural producers in the sub-sector of crop production is the gross harvest of agricultural crops in farms of all categories. In order to identify the economic characteristics of crop production, it seems necessary to determine the distribution of gross revenues by type of agricultural producers. On the other hand, it is advisable to identify the factors responsible for changing the structure of gross receipts and the economic reasons for these changes (Figure 3).
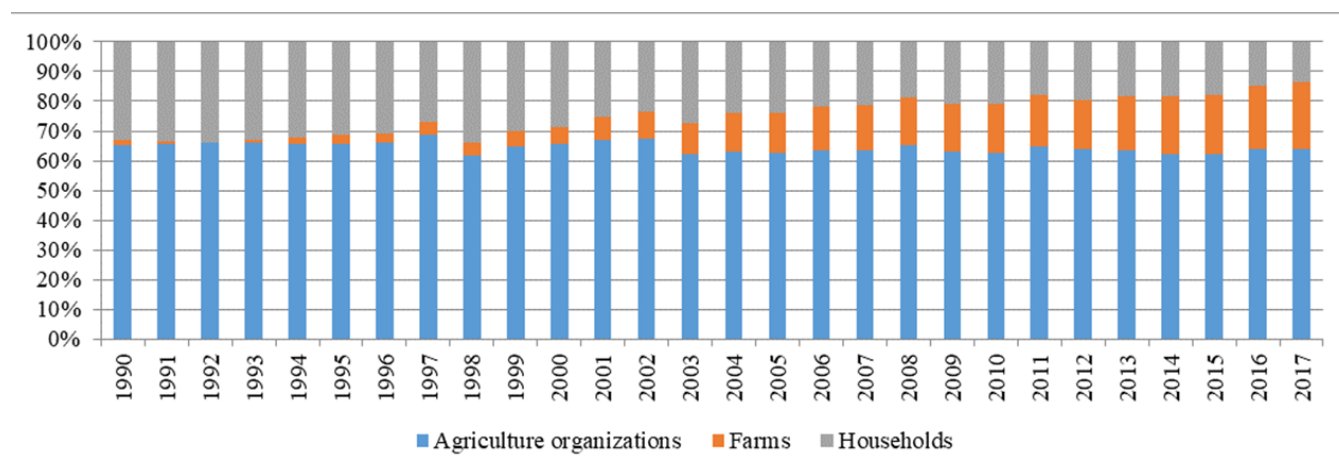
Fig. 3. Structure of gross harvest of agricultural crops by major producers in the Russian Federation in 1990-2017 (%)
Source: Federal State Statistics Service (Rosstat) https://www.gks.ru

Analysis of the structure of gross harvest of agricultural crops showed that in 1990-2017, the largest share belonged to organizations considered as agricultural producers in accordance with the Federal Law of 08.12.1995 N 193-FZ "On Agricultural Cooperation" (Figure 3). Thus, in 2016 and in 2017, 63.90% and 64.05% of the gross collection, respectively, fell on this category of agricultural producers - that is, the specific weight increased by 0.16%. The specific weight of the gross harvest, attributable to peasant and individual farm holdings and individual entrepreneurs, amounted to 21.14% in 2016, and in 2017 - to 22.56%, that is, the increase made up 1.41%. In turn, the share of the gross collection, which falls on the economy of the population, in 2016 was 14.96%, and in 2017 - 13.39% (the absolute growth of the structure was -1.57%).

However, for the period 2016-2017, the largest share in the structure of gross revenues fell on agricultural organizations. This is explained by the fact that this type of agricultural producers has the highest economic stability in comparison with others. Agricultural organizations easily overcome market barriers at the entrance to retail and wholesale trade networks, carry out significant advertising costs (the largest market players are represented by Miratorg Holding and Agro-Alliance Holding), and that ensures a consistently high demand for their products (Kevorkova et.al., 2019). As a result, agricultural organizations accumulate funds that allow

increasing the gross collection due to intensive and extensive development paths. In turn, the decrease in the share of households in 2016-2017 can be explained by the loss of interest in personal farming households.

The activities of in comparison with others do not have such a scale as agricultural organizations. However, the share of this category of farms is increasing in 2016-2017. The reason for this is subsidizing by the state of interest rates on loans for peasant and individual farm holdings after the food embargo was established. The growth in the use of financial resources becomes the basis for increasing gross revenues. At the same time, the change in the structure of the gross collection in 2017 in comparison with 1990 is explained precisely by an increase in the share of peasant and individual farm holdings and individual entrepreneurs by 20.89% and a decrease in the share of households in the population by 20.25% (Figure 4).
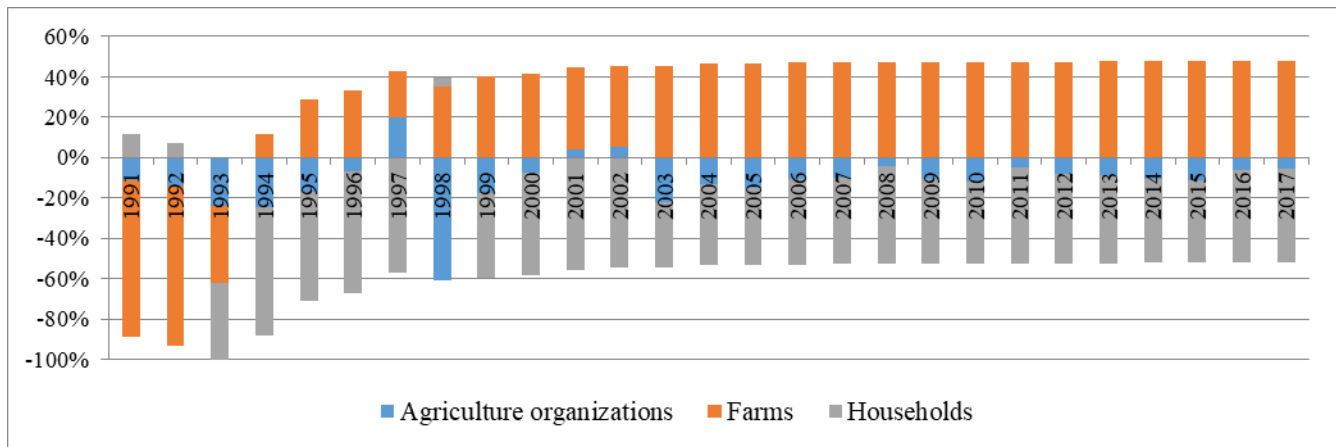
Fig. 4. Absolute changes in the structure of gross crop collection by categories of farms in the Russian Federation in 1991 - 2017 (in comparison with 1990, percentage points)
Source: Federal State Statistics Service (Rosstat) https://www.gks.ru

These changes in the structure of gross collection are determined by political and legal reasons. The entrepreneurial activity in the Russian Federation has increased in the 1990s: families owning large personal subsidiary plots were registered as individual entrepreneurs or created peasant and individual farm holdings, that is, they transferred the holding to organizational and legal forms, the purpose of which is to extract profit. In this regard, a comprehensive assessment of the differences in the structure of gross crop collection based on the application of the coefficient proposed by the Bulgarian professor. K. Gatev (Gatev and Galieva, 2008), should be carried out in accordance with the following formula:

$$K_G = \sqrt{\frac{\sum_i (d_{1i} - d_{0i})^2}{\sum_i d_{1i}^2 + \sum_i d_{0i}^2}}, \qquad (1)$$

where d_{1i} - specific weight of the i-th agricultural producer in the reporting period;
d_{2i} - specific weight of the i-th agricultural producer in the base period.

As is known, the change in the statistical indicators of the structure of any studied population (in particular, the gross collection of agricultural crops) is associated not only with the quantitative change of individual elements of the system, but also with changes in the structure of the population itself. In the theory and practice of statistical analysis, a special place belongs to the composite indicators of the estimation of structural shifts that have a convenient and compact scale of values - from 0 to 1 (the closer the value of the coefficient to 1, the stronger the differences in the structure), and also are universal, normalized and sufficient sensitive to structural shifts. As such can be considered the integral coefficient of structural differences K. Gatev, the index of structural differences A. Salai and the rank correlation coefficient of Spearman (Petkov L., 2017). For the generalized assessment of structural changes in the gross harvest of agricultural crops, the Gatev coefficient is used in the

study, since it is the easiest for calculation, while its interpretation is analogous to other coefficients of structural shifts (the Ryabtsev coefficients, Salai, etc.). In comparison with 1990, the structure of gross harvest by farm categories in 2017 has survived a slight change, since the Gatev coefficient was 0.11 (Appendix 1).

When studying the characteristics of agricultural production, it is essential to consider regional differences in the gross harvest of agricultural crops structure in order to identify the regions of the Russian Federation that are the main suppliers of crops. The largest share in 2017 was made by the Central Federal District (28.94%), and the smallest - by the Far Eastern Federal District (2.30%) (Figure 5).
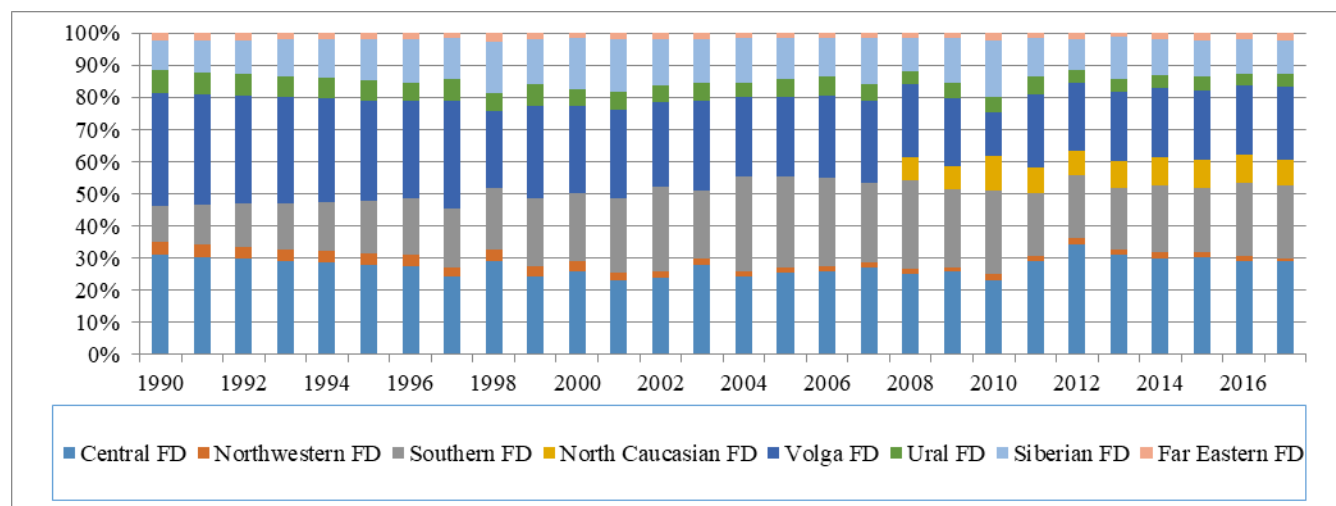
Fig. 5 Structure of gross crop collection in the Russian Federation by federal districts in 1990-2016 (%)
Source: Federal State Statistics Service (Rosstat) https://www.gks.ru

The specified features of the gross harvest structure (Fig.5), are primarily determined by natural and climatic conditions suitable for cultivation of agricultural crops. The smallest specific weight of the Far Eastern Federal District is also determined by the same reason. Another reason is the higher level of the banking system development in the Central Federal District compared to other federal districts - so that agricultural commodity producers operating in the Central Federal District have higher opportunities to obtain preferential loans for the development of their enterprise (in particular, for the purchase of selection seeds and seedlings, fertilizers and agricultural machinery). At the same time, if in 1990 the largest share was in the Volga Federal District (35.23%), and the smallest - also in the Far Eastern Federal District (2.19%), then in 2017 the Volga Federal District the share decreased by 12.50%. The reason of this change was decrease in the level of availability of financial and technological resources for agricultural producers in the Volga Federal District. Various factors determine the agricultural crop production. In our opinion, the size of sown areas (thousand hectares) is the most significant, since this indicator characterizes the supply of Russian agricultural producers with land resources (Figure 6).
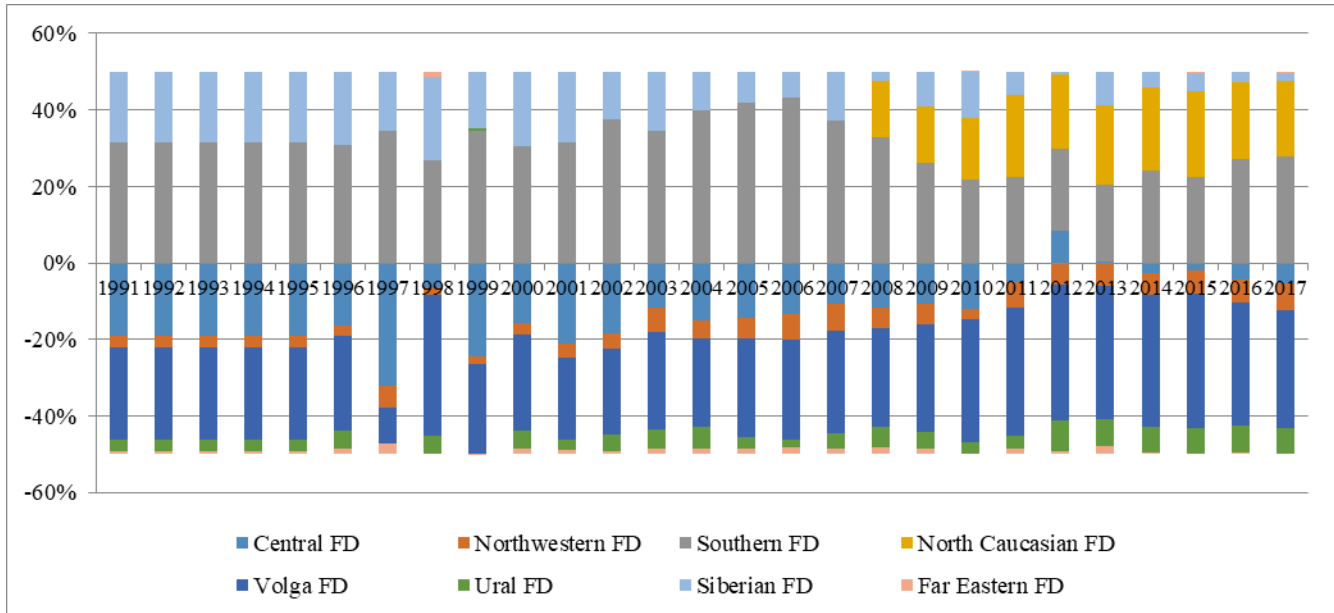
Fig. 6 Absolute changes in the structure of gross crop collection by federal districts of the Russian Federation in 1991 - 2017 (in comparison with 1990, %)

Source: Federal State Statistics Service (Rosstat) https://www.gks.ru

In 2017, the largest share in the structure of sown areas was made by the Volga Federal District (29.70%), and the smallest - by the Northwest Federal District (1.78%) (Appendix 1). In 1990, the Volga Federal District also made the largest share (30.18%). This is due to the fact that chernozems and meadow-chernozem soils in this region are favorable for the cultivation of agricultural crops. That is why, compared to 1990, the change in the structure of cultivated areas has been insignificant - the Gatev coefficient was 0.09 (Appendix 2). When studying the Russian agriculture state, it is necessary to take into account not only the indicators of the crop production sub-sector, but also the indicators of animal husbandry: the volume of meat, milk and eggs production. These products are classified as strategic, due to their high nutritional value (Kiseleva, et. al, 2019). Therefore, it is necessary to determine which federal districts of the Russian Federation are the main suppliers of meat and meat products to the Russian market. The obtained results can be used in the formation and adjustment of state programs aimed at the development of meat production (Fig. 7).
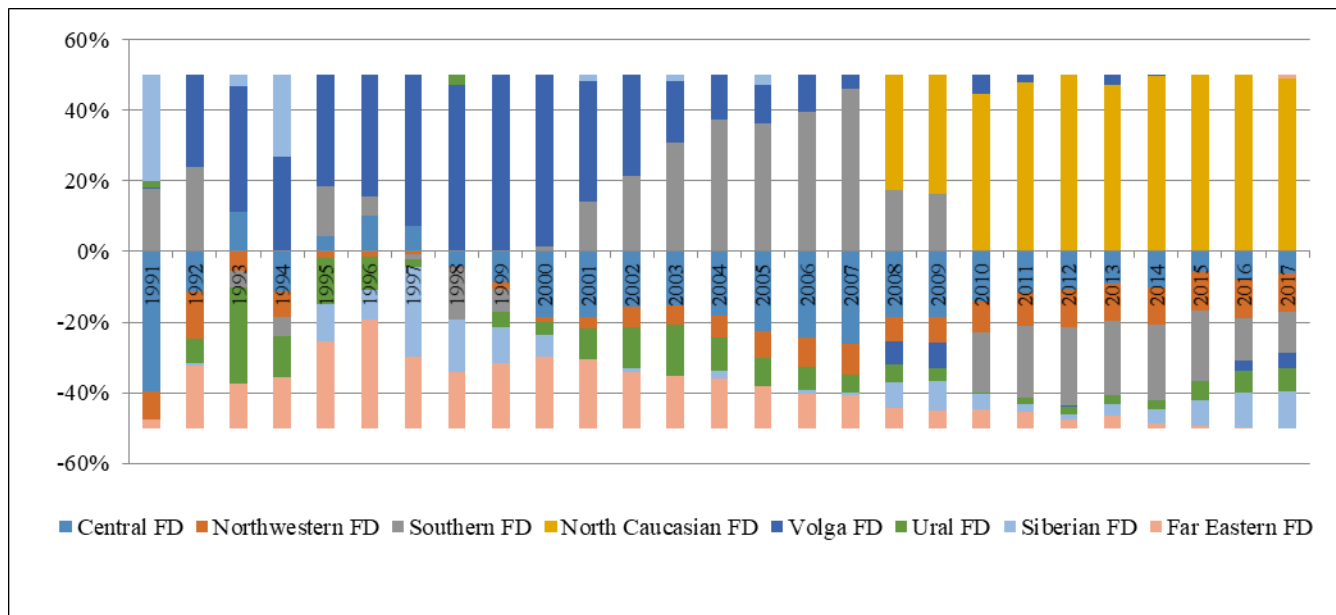
Fig. 7**.** Absolute changes in the structure of acreage of agricultural crops in the federal districts of the Russian Federation in 1991 - 2017 (in comparison with 1990, %)
Source: Federal State Statistics Service (Rosstat) https://www.gks.ru

Basing on the analysis of regional differentiation of the main indicators of the state of Russian agriculture, the following main conclusions can be formulated:

a) the largest volume of crop production, as well as livestock and poultry for slaughter (in slaughter weight) falls on the Central Federal District;

b) the largest crops-cultivating areas, as well as the highest level of milk and eggs production, and the consumption of fodder for livestock and poultry are in the Volga Federal District;

c) far Eastern Federal District can be characterized by the lowest values of agricultural development indicators.

The analysis made it possible to identify and characterize the development of the Russian crop production and livestock production market, taking into account the regional component. In our opinion, further research of the problems of food security of the state will be advisable in the direction of studying the systematic risks that accompany the activities of economic entities in the agricultural sphere.

5. Results

The study proposes to use mechanisms for creating cluster projects in the agricultural sector as a method of complex impact on the factors of systematic risks (in particular, price and volume risks) that affect the country's economic security. At the same time, the creation of cluster projects is one of the key methods to reduce the systematic risks inherent in the activities of economic entities in the agricultural sector. The cluster projects formation is aimed at solving the main problems of the agricultural sector related to the processing, storage, sale of products, as well as personnel and social issues. It should be noted that the implementation of cluster projects is the most promising form of state activity (in relation with spending public funds or simply mobilizing the public and public resources).

The designed form of implementing the state functions has a number of advantages:
a) clarity in setting goals facilitates the process of controlling the movement of cash flows;
b) concentration of financial resources allows to achieve results, avoiding the effect of "financial resources dilution";
c) increase of the possibilities for evaluating the effectiveness of program implementation.

While studying the results of entrepreneurial activity of agricultural producers in the Russian Federation constituencies, it is necessary to determine classes of regions that are similar to each other. In this regard, the relevance of the application of cluster analysis is increasing. Thus, a set of indicators that determine the volume of production of crop production can be considered:

a) gross collection of agricultural crops (thousand centers);
b) sown areas (thousand hectares);
c) average annual number of employed in agriculture (thousand people).

The cluster analysis was conducted using the method of tree-like clustering - since the clusters of Russian Federation constituencies differ by the level of crop production development in 2017 (clusters of dissimilarity or distances between objects (the territories of the Russian Federation constituent entities)). In this case, the objects were combined into clusters based on the Ward method (Ward J.H., 1963), since it allows the formation of clusters with a minimal intraclass variation. At the same time, the proximity between regions was estimated on the basis of the Euclidean distance metric. It should be noted that the use of the Ward method as one of the methods of hierarchical cluster analysis involves the unification of those objects that give the least increment in the sum of squares of deviations from the mean values, $V_k = \sum_{i=1}^{n_k} \sum_{j=1}^{p} (x_{ij} - \overline{x_{jk}})^2$ which leads to the formation of clusters of approximately the same size (Murray and Ginman, 1976). Note that each object can be described by r signs, and hence it can be represented as a point of r-dimensional space and it can be estimated in comparison with objects by means of the distance between them on the basis of the Euclidean space metric:

$$\rho_{ij} = \sqrt{\sum_{r=1}^{m} (x_{ir} - x_{jr})^2} \qquad\qquad (2)$$

Figure 8 presents the results of a cluster project for the Russian Federation constituent entities, taking into account the factors affecting the production of crops. When building clusters, a software package "Statistica" (developed by StatSoft) was applied, and that allowed to carry out cluster analysis by a hierarchical method (Pulford G., 2005). In general, 3 classes of regions of the Russian Federation, can be distinguished (Fig. 8).

The first cluster includes the following regions: the Novgorod Region, the Arkhangelsk Region, the Republic of Sakha (Yakutia), the Khabarovsk Territory, the Karachay-Cherkess Republic, the Republic of North Ossetia-Alania, Moscow, Murmansk Region, the Republic of Karelia, Kamchatka, Sakhalin Region, Sevastopol, the Chukotka Autonomous District, the Magadan Region, the Yamalo-Nenets Autonomous District, the Republic of Ingushetia, the Khanty-Mansi Autonomous Area - Yugra, the Republic of Tuva.

The second cluster includes: the Ryazan Region, the Republic of Mordovia, the Kurgan Region, the Kemerovo Region, the Amur Region, the Tver Region, the Zabaikalsky Region, the Astrakhan Region, the Kabardino-Balkaria Republic, the Chechen Republic, the Republic of Crimea, the Moscow Region, the Leningrad Region, the Udmurt Republic, the Sverdlovsk Region, The Penza Region, the Tyumen Region, the Krasnoyarsk Territory, the Samara Region, the Chelyabinsk Region, the Novosibirsk Region, the Republic of Dagestan, the Kursk Region, the Tambov Region.
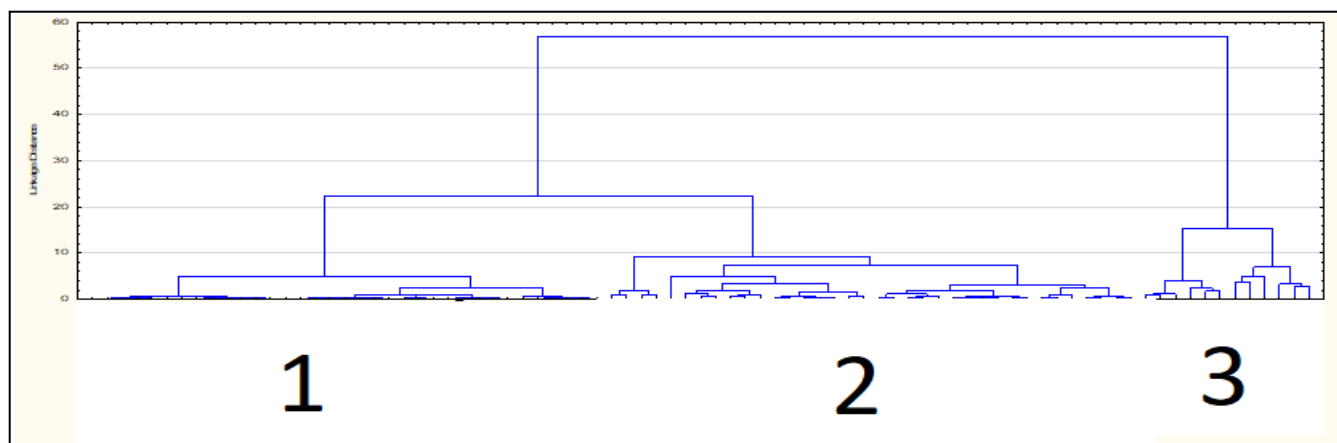
Fig. 8 Clustering of the Russian Federation constituent entities, taking into account the factors determining the volume of production of crop production in the medium term
Source: Suggested by the authors of the article based on the results of the package of applied programs Statistica http://statsoft.ru

The third cluster includes the following regions: Belgorod Region, Voronezh Region, Stavropol Territory, Krasnodar Territory, Rostov Region, Republic of Tatarstan, Volgograd Region, Omsk Region, Republic of Bashkortostan, Orenburg Region, Saratov Region, Altai Territory.

Based on the results of cluster analysis, it can be argued that the constituencies, which are part of the third cluster, specialize in crop production.

As the Gatev coefficients calculation showed, the structure of the gross crop collection in the Russian Federation and the cultivated acreage in 2017 has changed insignificantly in comparison with 1990. These minor changes determined the distribution of the Russian Federation constituent entities, identified on the basis of cluster analysis, according to the level of plant development in 2017. It can be assumed that in 1990 the Russian Federation constituencies were characterized by a similar level of crop production development. Figure 16 shows the cluster analysis of the data array characterizing the effect of various factors on the development of the livestock sub-sector for the subjects of the Russian Federation in 2017. This array contains the following indicators:

a) volume of production of livestock and poultry for slaughter (thousand tons);
b) volume of milk production (thousand tons);
c) volume of egg production (million pieces);
d) feed consumption for livestock and poultry (thousand tons);
e) number of people employed in agriculture (thousand people).

On the basis of the cluster analysis, four clusters of subjects of the Russian Federation were distinguished, differing in the features of the development of meat cattle breeding (Fig. 9).
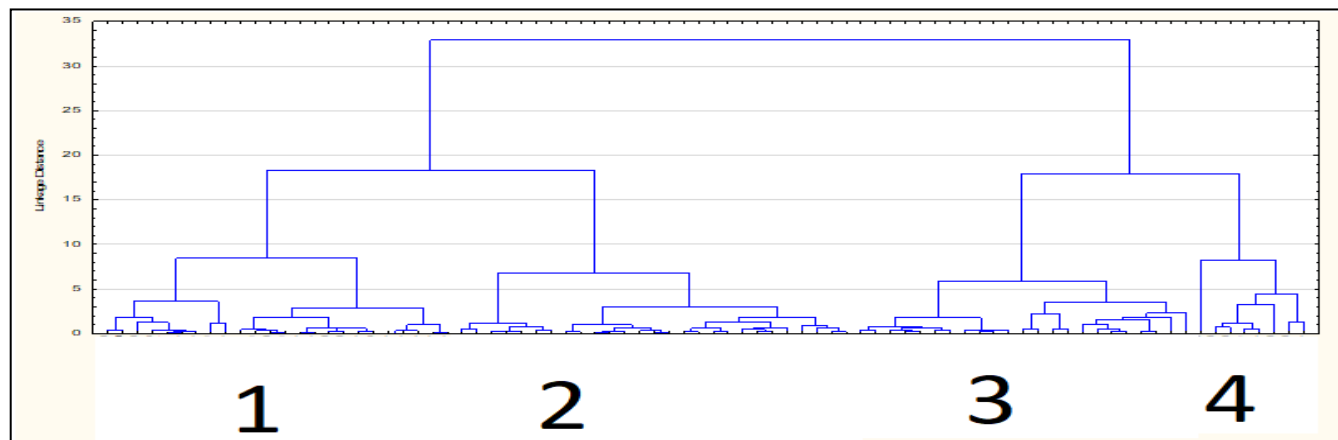
Fig. 9 Clustering of the Russian Federation constituent entities, taking into account the factors determining the volume of production of livestock products in the medium term
Source: Suggested by the authors of the article based on the results of the package of applied programs Statistica http://statsoft.ru

The first cluster includes Moscow, the Sakhalin Region, the Komi Republic, the Khabarovsk Territory, the Murmansk Region, the Magadan Region, the Republic of Karelia, the Kamchatka Territory, the Republic of Adygea, St. Petersburg, the Moscow Region, the Republic of Sakha (Yakutia), and the Kaliningrad Region.

The second cluster includes the Vladimir Region, the Ryazan Region, the Chechen Republic, the Perm Region, the Republic of Buryatia, the Ivanovo Region, the Republic of Tyva, the city of Sevastopol, the Republic of Ingushetia, the Jewish Autonomous Region, the Kostroma Region, the Chukotka Autonomous District.

The third cluster is formed by the Bryansk Region, the Krasnoyarsk Territory, the Novosibirsk Region, the Republic of Crimea, the Saratov Region, the Volgograd Region, the Orenburg Region, the Kursk Region, the Leningrad Region, the Sverdlovsk Region, the Astrakhan Region, the Lipetsk Region, the Kemerovo Region.

The fourth cluster is formed by the Belgorod Region, the Republic of Tatarstan, the Krasnodar Territory, the Rostov Region, the Republic of Bashkortostan, the Stavropol Territory, the Altai Territory, and the Republic of Dagestan.

Regions belonging to the fourth cluster are characterized by the highest indicators of the development of meat cattle breeding. This means that state policy aimed at supporting agricultural producers of the above-mentioned constituent entities of the Russian Federation should help support the potential of these regions. Increasing the level of economic security in this sphere that is carried out through coordination of the risk management process in the industry, the regulator can act as the initiator of cluster projects, choosing the sub-sector and the region to host the cluster. The choice has to be made in accordance with the natural competitive advantages of the region or considerations of food security, in case of need of settling and development of empty or not mastered territories, or increasing the level of transport infrastructure of any region of the country.

At the same time, threats to economic security and the risks of economic agents in the agricultural sector lie in the field of market and operational risks associated with them. Therefore, the main tasks that agro-industrial clusters have to solve are:

a)creation of infrastructure for primary processing and storage of products. To solve this issue, favorable conditions for attracting investments should be created in this sphere together with expanding opportunities for access of small and medium-sized enterprises that are not capable of creating their own infrastructure;

b)sales of manufactured products. This risk factor is of a systemic nature (especially characteristic for peasant and individual farm holdings of other small businesses, which often do not have alternative sales opportunities, except intermediary organizations (which offer a price that is far from fair, but even allowing operational payback);

c)elimination of the general economic and social decline of agricultural areas. The fulfillment of this task is a consequence of the solution of the two previous. Otherwise, the solution of this task is possible only due to a significant increase in the social burden on budgets of all levels.

6. Discussion

The essence of the proposed mechanism for reducing the systematic risks inherent in the activities of economic entities in the field of agriculture, an agro-industrial cluster of a new generation, is as follows. The study suggests the creation of an agro-industrial cluster in the form of a rural municipal formation of a mixed type (MFMT), which is an average population centre, whose inhabitants are usually engaged in agriculture and ensure the functioning of its social infrastructure. At the same time, MFMT is a combination of a system of production, primary processing, storage and marketing of agricultural products and a system of social infrastructure ensuring the quality of life that is comparable to urban. Thus, it is necessary to create an infrastructure that provides social standards to the residents and residents of adjacent territories:

central and local water supply (cold and hot water), including water needed for fire extinguishing; central gas supply or development of liquefied gas supply systems for collective use (Dück, et. al., 2015);
streets with a hard road surface, as well as a network of roads connecting it with populated areas in the service area, establish a passenger transport connection with the regional and regional centers (Kiseleva et. al., 2019);
objects of telephone communication on the basis of stationary and mobile communication systems (Bunich, et. al, 2018);
trade and purchasing objects of consumer cooperation, as well as branches of district housing and communal services enterprises and structures for servicing private household plots (Steinberg, et. al, 2016);
social facilities (pre-school institutions and schools, sports facilities and facilities, environmental tourism organizations);
necessary assistance (outpatient clinics, emergency rescue depots and posts);
objects of roadside service (catering, car service, gas stations, hotels), etc.

When creating the MFMT, a new type of village is being created, located in significant areas and having all the necessary infrastructure, allowing those who live there to have all the complex of services or entertainment. In fact, MFMT should be a large territorial unit that meets the following criteria:

individual plots of land corresponding to the average farming area in Russia (about 100-150 hectares) or smaller in area, while the resident of the agro-industrial cluster has the possibility of combining several individual plots into a single farm based on the needs of the business;
availability of infrastructure for providing a comfortable life and social environment in the city, including:
polyclinics and hospitals, schools and kindergartens, police and fire departments, shops, cafes, restaurants and other entertainment and other infrastructure facilities, i.e. infrastructure, available in modern "sleeping" areas of large cities;
availability of storage infrastructure, primary processing and marketing of agricultural products.

The creation of agro-exchange centers within MFMT would work as a mechanism for the fair price determining. The mechanism of its functioning is as follows - MFMT creates procurement information centers that accumulate

information about commodity balances and purchase products meeting the requirements of the exchange (Velasquez-Pinas, et. al. 2018). Moreover, the agro-exchange centers accept bids from traders and deals. The development of the exchange market can subsequently lead to the development of the market of commodity derivatives (the development of the market for derivative financial instruments began precisely with grain futures). Consequently, the creation of MFMT will solve the problem of primary processing, storage and marketing of products, reduce systematic risks of the agricultural sector and will give impetus to the development of the industry, and at the same time, will provide possible partial solution to the problem of megacities' overpopulation.

7. Conclusion

To stimulate the agricultural sector development, a distinct advantage is taken by budget subsidies. In particular, the bulk of state support for the agro-industrial complex is provided in the form of subsidies in the framework of various state programs for the agriculture development and the regulation of agricultural markets, raw materials and foodstuffs in the State Program for the Development of Agriculture and Regulation of Agricultural Products, Raw Materials and Foodstuffs for the period up to 2020 (the road map). Based on the systematization of methods for stimulating import substitution in the agro-industrial complex, it was noted that the "road map" focuses on activities in the sphere of ensuring Russia's food security, including the creation of an automated information system, as well as improving land use efficiency, state veterinary and phytosanitary control, customs and tariff regulation of the import of products. At the same time, in the face of a reduction in budgetary resources and shortcomings in price and credit regulators, the use of both tax and non-tax instruments that are versatile and equitable should be expanded. The use of state incentive tools for import substitution must be systematic, that is, subject to a single strategic goal.

In this regard, the main ways to institutionalize import substitution in the agricultural sector should be:

borrowing of advanced technologies, primarily implemented in the EEU countries. A positive aspect of this method is that it allows the production of competitive products of appropriate quality. This is especially true for solving urgent problems in those sectors of the economy where there is a high degree of technological backwardness. However, this method requires significant financial costs and does not have a self-healing device, since it does not develop its own technologies, so it can be used to solve local tasks of the transition period;

creation of a harmonious environment through the selection of institutions capable of becoming incubators for business entities manufacturing products (producing goods, performing work, providing services) within the framework of import substitution, including the creation of conditions under which economic agents could realize the profitability of such activities in the near and medium-term outlook;

stabilization of import substitution by controlling and correcting the institutional movement by involving large corporations, business systems and financial-industrial groups in the import substitution process.

As one of the possible directions for improving the tools of state financial support in the agricultural sector, tax incentives for import substitution could be applied. As for Russia, the current system of tax incentive of agricultural development has the following features:

possibility to apply the zero rate (0%) of income tax with in relation to particular activities, as well as reduced rates of value added tax (VAT) at a rate of 10% for the realization of a number of products (bread, milk, eggs, etc. in accordance with the list set within the Tax Code of the Russian Federation), low rates of the land tax with respect to the agricultural lands and benefits for transport tax for agricultural machinery, delay or installment of the tax payment (up to one year) and investment tax credit (Dudin, et.al, 2015);

possibility to use a special tax regime in the form of a unified agricultural tax (UAT), substituting the payment of tax on the profit of organizations (the profit is taxed at the main rate of 20%), tax on the property of organizations (except property taxed by cadastral value), the value added tax (excluding VAT, paid on the import of goods on the Russian customs territory).

It should be noted that despite the fact that the tax system for agricultural producers is positioned by the state as a beneficial tax regime, it did not find a wide use among the taxpayers. The reason is that the Russian Federation Tax Code establishes a closed list of costs, reducing the tax base for UAT. As a result, the costs that have not been put in this list are not taken into account for tax purposes. In turn, in relation to the activity in the general taxation system, the taxpayer has to justify the compliance of costs incurred (the economic validity of costs, documented approval of the costs incurred, and the fact that the purpose of the costs was to gain income or economic benefits). Therefore, agricultural producers have more opportunities to reduce the taxable profit due to the fact that the list of the costs subtracted from the tax base is open (Veselovsky, et. al, 2015). As various economists estimate, the taxpayers, using the general taxation system, are more adapted to business management: the level of the tax burden is comparable to that of special tax regime (15,88% vs 13,14%, respectively). Their main activity brings twice more income compared to those organizations using special tax regime (UAT). In addition, the organization applying the general taxation system uses capital assets and equipment more effectively, amount of subsidies achieved is 20% higher, and the average wages are 10% higher than in the companies applying UAT (Petrov, et. al, 2019). It should be noted that the existing directions of the tax incentives in the agricultural sector are of scattered character, they are not focused on the import substitution and do not take into account the deep-rooted problems of agriculture. These, in particular, include:

returning the market to national agricultural producers and the rest of the subjects of the agricultural sector;

increasing the attractiveness of the village for the workforce, supporting the standard of living of the rural population;

creating conditions for the production and realization of competitive agricultural products.

In this regard, as part of the institutionalization of import substitution, the tax incentives must be aimed primarily on the solution of the following systematic problems, existing in the following forms:

support of production and providing the consumer with agricultural products, that will allow the country's economy become fully self-sufficient. In order to do that, in the medium term an adequate system of procurement, processing, storage and implementation of these products by the subjects operating in the agricultural sector (including various forms of organizations, e.g. consumer cooperatives) should be formed.

formation of a harmonious business environment by selecting institutions able to become incubators for business entities, producing goods, performing works and providing services within the framework of import substitution, together with the creation of the conditions under which economic agents could understand the benefits of such activities in the nearest and medium-term prospects;

stabilization of import substitution by controlling and correcting the institutional motion, involving large corporations, business systems and financial and industrial groups in the process of import substitution.

These disadvantages of the tax incentive of small business in agricultural sector reveal an objective need to find new ways to develop micro-business taxation. The use of foreign experience in this aspect has been successfully proven in practice, e.g. in France the state actively uses the income tax to implement the main points of protectionist policy (Cooper, et. al., 1994). Moreover, there are three models of taxation in agriculture, depending on the level of farmers' income, the essence of which is to provide tax benefits to small manufacturers with low level of income. In turn, in Australia the main taxes established for farmers are: income tax (30%) and sales tax (22%) - the last one is more similar to Russian VAT, as taxpayers can take the incoming tax to offset. The tax on medical care at a rate of 1.5 to 2,5% is also paid from the taxable profit (Blundell and Robin, 1999). The so-called "primary producers" are entitled to approved benefits of the tax profit organizations - usually it is the transfer of obligations to pay the tax to the future periods. A special system of alignment for income tax for individual farmers in effect - thus a part of the non-taxed profit can be transferred to special funds (Farm Management Deposits) in order to be added to the current assets in unsuccessful years. In the United States farmers are not entitled to the reduced rates on income tax, and the beneficial nature of taxation in agriculture is that most of the farmers have low income and pay income tax at the minimum rate. However, they have a number of other benefits. For example, they are allowed to reduce the taxable base on the payment to the social funds or to pay the

tax from the average income for the three previous years (Bulyga, 2014), moreover, the farmers can take advantage of accelerated amortization of the fixed assets. These foreign benefits can find successful reflection in the national tax incentive practices in relation to small businesses in the agricultural sector for the countries with a developing market.

Taking into account all mentioned above, it is possible to formulate the following proposals for tax stimulation of the institutionalization of import substitution in the agricultural sector for the countries with a developing market: (1) introduction of target investment benefits of income tax and unified agricultural tax for agricultural organizations purchasing and introducing new technologies in the production, as well as (2) the establishment of the deduction from the tax base the costs on reconstruction, modernization and technical rearmament, plant and equipment with enhances factor. Borrowing environmentally safe technologies should be considered as a priority. Agricultural producers (and first of all, consumer cooperatives engaged in sales and processing of the national agricultural products), should have advantages in comparison with enterprises dealing with processing and marketing products from the imported raw materials. Another perspective direction is the production of ecologically clean products, requested by individuals whose income is above average. Therefore, it seems that specific measures of economic promotion (tax preferences for producing ecologically clean products on the lands newly introduced in the turnover) should be established. The interest in buying ecologically clean agricultural products is a priority to the use of clean technology and resource saving.

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Appendix 1. Gatev coefficient calculation for determining structural differences in gross crop collection in the Russian Federation in 2017 as compared to 1990 (by categories of agricultural producers)

	Gross harvest of agricultural crops, thousand tons		d_i		d_i^2		$(d_i^{2017} - d_i^{1990})^2$
	1990	2017	1990	2017	1990	2017	
Agriculture organizations	953 915,51	1 680 794,62	0,6527	0,6405	0,4260	0,4103	0,0002
Farms	24 035,43	591 907,32	0,0164	0,2256	0,0003	0,0509	0,0026
Households	483 514,48	351 301,77	0,3308	0,1339	0,1095	0,0179	0,0084
In total:	1 461 465,42	2 624 003,71	1,0000	1,0000	0,5358	0,4791	0,0112
Gatev Coefficient							0,11

Appendix 2. Gatev coefficient calculation for determining structural differences in acreage in the Russian Federation in 2017 as compared to 1990 (by federal districts of the Russian Federation)

	Sown area, thousand hectares		d_i		d_i^2		$(d_i^{2017} - d_i^{1990})^2$
	1990	2017	1990	2017	1990	2017	
Central FD	23 744,31	15 722,22	0,2017	0,1950	0,0407	0,0380	0,0000
Northwestern FD	3 530,84	1 433,37	0,0300	0,0178	0,0009	0,0003	0,0001
Southern FD	20 098,11	12 719,88	0,1707	0,1578	0,0292	0,0249	0,0002
North Caucasian FD	0,00	4 392,82	0,0000	0,0545	0,0000	0,0030	0,0030
Volga FD	35 527,36	23 943,60	0,3018	0,2970	0,0911	0,0882	0,0000
Ural FD	8 485,21	5 209,80	0,0721	0,0646	0,0052	0,0042	0,0001
Siberian FD	23 426,91	15 119,42	0,1990	0,1875	0,0396	0,0352	0,0001
Far Eastern FD	2 892,42	2 076,11	0,0246	0,0258	0,0006	0,0007	0,0000
In total:	117 705,16	80 617,22	1,0000	1,0000	0,2073	0,1944	0,0035
Gatev Coefficient							0,09

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RISK MANAGEMENT AT EDUCATIONAL INSTITUTION*

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Abstract. Educational institutions have the right to independently determine the paths of their development, the methods and goals of their achievement, which made them full-fledged subjects of a market economy. The public's demands for the quality of education have increased, the technological side of education has been radically updated, the economic and organizational conditions of their activities are changing rapidly, competition in the educational services market is growing, and the state's attitude towards the education system is steadily changing. Increasing the freedom and independence of educational institutions has led to an increase in their responsibility for the results of their activities. The transformation of the working conditions of the educational services market in the current conditions of socio-economic development of the Russian Federation actualizes issues that are closely related to risk management in educational institutions, because an increase in the independence of educational institutions entails an increase in managerial and, in particular, financial risks for erroneous decisions . In this regard, there is a need to search for effective risk management mechanisms, especially since today there is no universally recognized theoretical approach to the issue of risk management in the field of education.

Keywords: risk management; management; educational institutions; efficiency; implementation problems

1. Introduction

The creation of a risk management system arises with the definition of the subjects and objects of the system, as well as the risk management process. There a lot of attention to various facets of risk management in current literature (e.g. (Androniceanu 2017; Tvaronavičienė 2018; Fakhry et al. 2018; Litau 2018; Akberdina et al. 2018; Sycheva et al., 2018; Goloshchapova et al., 2018).

The activities of educational organizations, similarly like other institutions, are subject to various types of risks that require the creation of a risk management system. The specifics of the risk management of educational institutions is determined by the characteristics of educational services, the labor market and other factors of the educational market. For this reason, to create a risk management system in educational institutions, first of all, it is necessary to develop an organization development strategy, then design a factor model, then form a risk management model (Pastukhov 2013; Menyaylo 2016; Sharafutdinov et al., 2018; Goryushkina et al., 2018, 2019; Corluccio 2019; Voronkova et al., 2019).

In 2005, the first study of the risks in education appeared. So, E.V. Ilyashenko considered the main risks that arise when introducing specialized education in schools. N.D. Sorokina emphasizes that, first of all, the challenges and threats important for educational activities should be highlighted (Sorokina 2009). She refers to them the transition to a "knowledge" society, the rapid obsolescence of the transmitted knowledge, the wider spread of the Internet as a global network, the informatization of almost all life situations, etc.

In educational activities, the objects of risk management are the following processes: resource management, management of innovative and scientific and methodological activities, personnel management, the provision of educational services, procurement management, maintenance, disposal and repair management.

The head of the educational institution is the only subject of risk management carried out in educational activities (Bozhkova et al., 2019; Ahtarieva et al., 2018; Thalassinos et al., 2011; Tarman, 2012; Korableva et al., 2019; Tarman and Dev, 2018; Tarman, 2018; Tünkler et al., 2016). At the same time, foreign experts are of the opinion that it is necessary to distribute responsibility between the leaders of different areas who need to take an active part in the risk management system (Effective risk management in the school). The management staff of educational institutions face risks daily. Risk management can help management personnel correctly understand and evaluate risks, create measures against risks in order to increase the likelihood of successful work.

2. Methods

The risk in the field of educational activity lies in the lack of achievement by stakeholders (educational institution, person, society, state and employers) of goals, which largely depend on the quality of education received (Girdzijauskaite et al. 2019; Shatunova et al., 2019). However, there is a likelihood that stakeholders through the use of educational institutions by an effective, constantly improving risk management system, as well as a system for predicting the future wishes of graduates and consumers of educational services, can get results higher than their expectations.

Let us classify the risks of educational activity. Risks in the field of education can be divided into systemic and non-systemic. The degree of systemic risks cannot be reduced, since their presence is determined by the education system itself. Often, systemic risks are associated with the external environment - the macroenvironment of the organization of the educational sphere. The macroenvironment of the educational organization consists of enlarged groups of factors that form the systemic risks of the activities of this organization of the educational sphere (table 1). Unsystematic are unique risks, whose level can hypothetically decrease to a certain level (table

2). You can also highlight the unique risks of educational organizations associated with their internal environment (table 3).

Table 1. Types of systemic risks of the educational organization

Factors	Types of risk	Characteristic
Political factors	Political risk	Political uncertainty, regional conflicts
	Legislative risk	Legislative instability, changing educational standards
Economic forces	The risk of changes in incomes	Change in real incomes of the population: - an increase in income will affect the choice of the most prestigious educational institution; - a decrease in income will affect the decrease in demand for paid educational services
	Demographic risk	Decrease in birth rate can lead to a decrease in the number of students
	Psychological risk	Deterioration of the educational environment that impedes the full personal and mental development of students
	Social risk	Change in interest in education, change in unemployment
Technological factors	Innovation risk	Changes associated with the use of innovative technologies in education, research

Source: Menyailo, 2016

As mentioned above, risk minimization is not a universal approach to making optimal decisions in risk situations, which is explained by a very simple question: even without taking into account the costs of risk reduction, choosing the smallest decisions from the point of view of risk often leads to relatively small incomes.

Table 2. Types of unique environmental risks of the educational organization

Factors	Types of risk	Characteristic
Competitors	Risk associated with competitors	Changing the position of the organization of the educational sphere in the market of educational services, modifying the position in Russian and international ratings
Consumers of educational services	The risk of changes in the demand for services related to educational activities	Changes in demand associated with changes in the prices of educational services or consumer preferences
Companies, organizations	Risk associated with employment of graduates	Refusal to provide places of practice, reduced interest of employers in hiring graduates of this institution
Social partners	The risk of changing relationships with social partners	Decrease or increase in the number of joint projects that are associated with the preparation and conduct of Olympiads, continuing education courses, etc.
State bodies that exercise control	Risk associated with accreditation and licensing of educational	Non-receipt by the institution of a license to carry out educational activities, denial of state

| (supervision) in the field of education | activities | accreditation of educational activities for educational programs declared for state accreditation |
| | Risk of insufficient funding for educational activities | Reduced funding for research and development and educational activities |

Source: authors

At the same time, there are a large number of situations when the size of the risk, of course, should be reduced to the smallest values. These are the risks of various irreversible events. So, the risk that a fire may occur in an educational institution must be minimized, regardless of the costs of minimizing it.

When constructing a risk management system, an educational organization sequentially determines the sources of risk, exposure zones, events and their causes, the likely consequences of the onset of certain types of risks.

Table 3. Types of unique risks of the internal environment of the educational organization

Factors	Types of risk	Characteristic
Organization of the educational process	Strategic risk	Changes in the strategy of the educational organization
	Organizational risk	Organizational changes in the structure of the educational process and the organizational culture of the organization of the educational sphere
	Operational risk	Loss of contingent, changes in the educational process
	Innovation risk	Changes that are associated with innovations in the research, educational, administrative, scientific and technical process
	Marketing risk	Changing the image of the organization of the educational sphere
Staff	HR risk	Lack of personnel, reduction of competence and demotivation of personnel
Finance	Financial risk	Shortage of working capital, deterioration of the financial and economic situation of the organization of the educational sphere

Source: authors

The degree of risk cannot be reduced to almost zero: even as a result of very expensive events, the possibility of a fire in an educational institution remains a positive value. We can only say that such a probability will be less than the significance level, that is, so small that the fire can be considered a practically unrealizable event.

The risk management process in the educational institution works taking into account: process and system approaches, sustainable improvement, contribution to the process of the most efficient use of capital and resources, protection of the educational organization's property, improvement of its image, growth of the teaching staff qualification and formation of the organizational base in management, process optimization.

The risk management process can be represented in the form of a scheme, where the entrance is the operational goals of the school, the results of external and internal audits, analytical materials reflecting the development trends of the internal and external environment, research results, operational plans and reports of structural units of the educational institution, a management report on the conducted work.

At the output of the risk management process, a risk register (card), a risk management plan, and a report on existing risks are created. These documents provide information about the operational risks of the underlying

processes. The process itself includes a procedure for assessing and monitoring risks, it contains documents explaining how to identify and assess risks that are suitable for use in an educational institution (see Fig. 1).

Entrance

Risk Assessment and Monitoring Procedures

Exit

- operational goals of the school,
- results of external and internal audits,
- analytical materials reflecting the development trends of the internal and external environment,
- research results,
- operational plans and reports of structural units of the educational institution;
- management report on the work done.

- risk register,
- risk management plan,
- risk report.

Fig. 1. The risk management process
Source: authors

To date, a number of risk assessment methods have been developed that can be divided into two large groups: qualitative, such as the "tree of consequences" or "tree of causes," and quantitative, such as the Monte Carlo method, as well as the probability density function.

Risks can come from the categories of four varieties: places, people, money and things. Risks associated with people - teachers, specialists, researchers, etc. are expressed in their action (or inaction). The same group may include violations by employees of legislative acts (starting with the policy of an educational institution and ending with a violation of Russian laws, for example, by applying violence to students), injuries on the territory of an educational organization, etc.

The communication and information stage serves as the main connecting link of the entire risk management system and other management systems of the educational institution. At this stage, risk information is collected, which serves as the basis for making reasoned managerial decisions by the leaders of the educational institution. Depending on how the communication process is organized, how much risk information is provided to the manager in the necessary volume and in a timely manner, the effectiveness of the entire risk management system will be determined (Dunets et al., 2019).

Based on the information received from the external environment, the management of the educational institution makes decisions on choosing approaches to risk management, which can be as follows depending on the level of importance of risk (as a rule, there are four main ways of risk management): refusal (avoidance) of risk transferring risk to the other party, reducing risk and accepting risk / reimbursement.

Risk management is an integral part of the project management process, since it involves the occurrence with a certain probability of an event that will affect the result (the implementation of a task or plan). In the risk management of educational institutions, particular importance is given to the risk management of construction

projects, which makes it possible to determine the potentially unbearable growth of costs, the suspension of work time or problems associated with their quality.

The advantages of integrating risk management into the management system of educational institutions are:
- increased perception of risk, opportunities and threats;
- planning, "look into the future";
- increasing the likelihood of successfully achieving the desired results.
The risk assessment process in an educational institution is associated with the following approach:
- identification of organization goals and risks;
- consideration of the origin of risks and their importance;
- planning risk management actions;
- management / control / monitoring of the results of the chosen approach (to track its effectiveness) (Serebryakova, 2017).

The risk in the identification process can be attributed to one of the following categories:
- management risk
- operational risk
- regulatory risk,
- financial risk.

The main task of the leadership of the educational institution is to create a sustainable risk management program, since the educational organization and its environment are constantly changing, but risk management should always remain. The main element of a dynamic and sustainable risk management is monitoring and consideration of identified risks, as for their effective management should:

- delegate responsibility by indicating in the job responsibilities the need for risk management;
- identify indicators that can be used to find the magnitude of the risk;
- introduce the reporting of the leadership of the educational institution to reduce certain risks identified earlier.

3. Results

The risks of the organization of the educational sphere are probabilistic in nature and establish various consequences for the organization. That is, for risk management and constant monitoring, two risk characteristics should be included in the criterion for their selection: the probability of its occurrence and the consequences of the onset for the organization.

The risk map (or risk matrix) makes it possible to group risks from the point of view of probability of occurrence and importance, and shows the general picture of risks faced by the activities of educational institutions (Fig. 2).

Areas of risk for the educational organization are distinguished according to the degree of acceptability, since the main task of risk management is to improve the organization's position, "transfer" it from a risk zone of lower acceptability to a risk zone of higher acceptability (for example, from a high risk to a low or medium risk area).
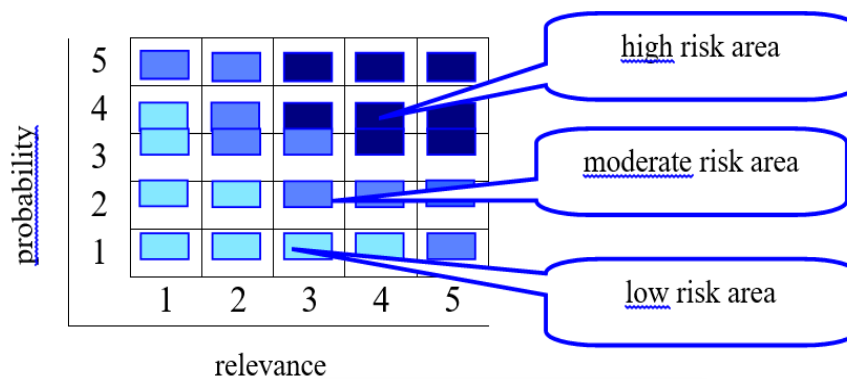
Fig. 2. Risk matrix / map
Source: Kornienko, Makarova 2015

When used correctly, a risk matrix / map is an effective risk management tool. The educational organization, being in a certain position in the analyzed coordinate system, bears losses from risks, moves in the risk matrix towards a better position and causes "position change costs". A comparison of changes in losses incurred with "costs of changing positioning" allows us to evaluate the effectiveness of risk management in educational institutions, and compare the effectiveness of managing such organizations.

Another way of ranking risks is to use a matching matrix. Moreover, all risks are presented in pairs, for comparison - by the degree of probability / impact, or other indicators. The following risk management model can be proposed. This model (see. Fig. 3) allows you to apply different risk management methods for any risk group of educational institutions, taking into account the specifics of the industry.
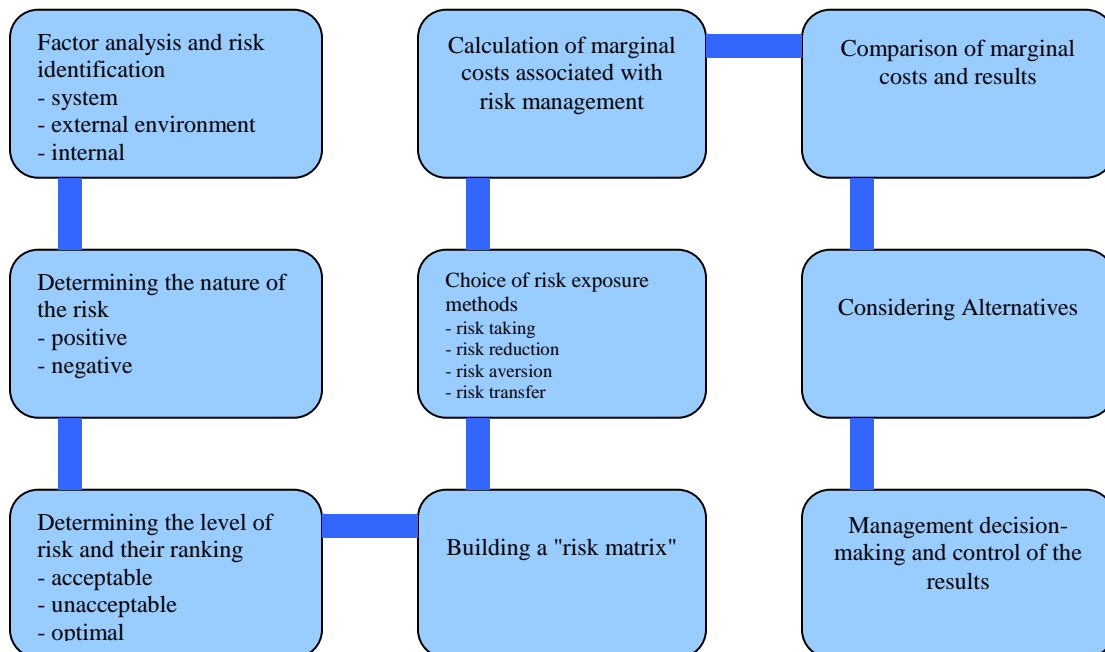
Fig. 3. Risk management model of an educational institution
Source: authors

The probability of manifestation of different types of risk can be estimated either by the method of expert estimates, or by the method of statistical observations. In some cases, a method of assessing the probability of risks can be used, based on the experience of the leadership of the educational organization, using a rating system: 0 - there is an insignificant risk; 25 - most likely the risky situation will not occur; 50 - nothing definite can be said about the possibility of an offensive; 75 - most likely a risky situation will occur; 100 - a risky situation will surely come.

The probability of the onset of risk and its consequences can also be determined by modeling the outcome of a series of events, extrapolating the data encountered or data obtained through experimental studies.

Risk management is a rather complex process and when it is introduced into the work of the organization of the educational sphere, it is faced with the need to review the roles and responsibilities of managers and employees. Risk management is perceived as a linear process, not a system (Zubachev, 2018). When implementing risk management in an organization, clear, consistent commitments should be made, since this process is an integral part of management decisions and should not be separated from them.

The success of the implementation and development of risk management in educational institutions directly depends on senior management. The risk management strategy is developed depending on the directions of the enterprise (Khizhnyak, 2017). Realization requires reliable information, therefore it is important to establish its exchange and include the process of collecting information about risks. Exchange of information with external stakeholders will give conclusions in terms of their perception of this risk. The point of view on the values, needs, problems of the organization may differ from internal understanding. This may provide new information that management had not previously suspected.

The determination of the necessary resources, powers and responsibilities should begin with the definition of the activities of processes, functions, services. After this, by determining the relationship between specific processes, activities, projects and activities, processes in the educational institution, it is also necessary to determine the methodology for assessing the importance of risk, as well as the criteria established at the beginning of the process and which will be reviewed on an ongoing basis after. It is also necessary to determine the sources of risk, the area of impact, events, causes and their consequences.

During the implementation of the risk management system, it is necessary to determine:
- types and nature of causes and consequences that may appear, and methods for their measurement;
- a method for determining the possibility (or probability);
- time limits of opportunity and its consequences;
- a method for finding the magnitude of the risk;
- level of acceptable risk;
- the possibility of multiple risks and their combinations.

In order for the work of the risk management system to be successful, it is important to establish effective communications within the team on the separation of powers and responsibilities related to risk management, analysis skills, the ability to accurately measure benefits and costs. There are important differences between modern risk management and "traditional" risk management methods (Mitrofanov et al. 2018).

Firstly, this is the management system itself. The "traditional" approach does not have integrity: management is carried out in any single unit according to the functions performed by it. There is no consistency between units in this matter. The risk management system is characterized by avoiding fragmentation and replacing it with integration. Each employee is involved in the process, and the organization's management, which refers to risk management as part of everyday work, manages the system itself.

Secondly, it is scale. The "traditional" approach focuses narrowly on a certain segment of risks, for example, financial. The risk management system, on the contrary, covers absolutely all types of educational organization activities.

Thirdly, the frequency of risk management. The "traditional" approach carries out risk management from time to time, from time to time, while the risk management system works continuously.

The following advantages of risk management can be distinguished in comparison with the "traditional" methods of risk management (Fig. 4):

Advantages of risk management in comparison with "traditional" methods of risk management
- increasing the quality of information for making management decisions;
- elimination of the uncertainty factor in the implementation of educational and research activities;
- control over negative impacts, timely implementation of measures to reduce the likelihood of their occurrence and negative impact;
- improved planning, which allows timely use of favorable prospects, reduce negative impacts;
- resource saving;
- improving communication between parties involved in the process;
- founders support;
- growth of ratings and business image;
- control of production processes and investment projects.

Fig. 4. Advantages of risk management in comparison with "traditional" methods of risk management
Source: authors

The implementation of risk management in educational institutions is hindered by the fact that they do not have the necessary regulations and documents of an organizational and administrative nature, which complicates the analysis and control of risks. The head of the organization must prepare all the necessary documents to ensure reporting in a standardized form, as well as recommendations for its preparation. The main regulatory documents of the risk management of the educational organization should include:
- "Declaration of risk management";
- "Guide to risk management";
- "Risk Management Program".
The main barriers that interfere with effective risk assessment in educational institutions are:

- lack of planning: often enough, the head of the organization makes decisions in a hurry, which makes the risk assessment inaccurate and incomplete due to the lack of necessary information and the impracticability of anticipating future problems;
- the use of short planning horizons: the leaders of educational organizations traditionally pay more attention to current planning, during which only existing risks can be identified;
- lack of high-quality (structured and ordered) relevant information;
- lack of qualified personnel, experience and methodological support (equipment and tools of analysis);
- difficulties in accurately assessing opportunities and risks, finding an appropriate balance between them, weighing, for example, financial and other risks;
- discomfort (in some cases due to the need to openly acknowledge the existing risk) when implementing risk management;
- the specifics of the management of educational institutions.

Part of the policy of the educational system, which is determined by a set of regulatory requirements, methods of fulfilling these requirements for members of the educational organization's team, should be the prevention of managerial risks (Sabitova et al., 2018; Plaskova et al., 2017; Salimova et al., 2019; Ilhan et al., 2019; Trofimova et al., 2019; Jarrah, 2019). The goal is to minimize probable losses and losses.
Prevention of managerial risk in the activities of a manager, in addition to his awareness of risk management processes, consists in a continuous increase in managerial competencies. That is why the management risk prevention system should be an ongoing process of growth for the manager's qualifications and combined with diagnostics and forecasting, which ultimately not only minimizes management risks, but also significantly increases the effectiveness of management activities.

4. Discussion

In educational institutions, it is important to consider hygiene conditions and other factors that influence the preservation of health and the development of a harmonious personality (Carothers, 2018; Bittman and Russell, 2016; Solas and Sutton, 2018; Arifin et al., 2019;. Kayumova et al., 2019; Prodanova et al., 2019a,b; Singareddy et al., 2019). An educational institution should take care of reducing the intensity of noise, bring color regulation, lighting to normal, review the layout of furniture, etc. It is important to create a favorable psychological climate in the team, you should also monitor the comfort of finding students in an educational institution.

An example of health-saving technologies in education is the "technology of the liberated development of children", which was developed by physiologist V.F. Bazaar, when used, the indicators of child morbidity are reduced, the psychological climate in pedagogical and children's groups is improved, the public is actively involved in work to promote health, etc.

✓ An example of the technology of psychological support of the study group is the methodology of M.Yu. Gromova and N.K. Smirnova, built on the principles of pedagogical psychotherapy and psychology of health (Smirnov, 2009). Its foundations include the active participation of the psychologist in the educational process, the transformation of the psychologist into an important figure in the educational process, which is based on the principles of health conservation.

Conclusion

Thus, the specificity of educational activities makes significant adjustments to the organization of risk management in educational activities. This suggests that of the large number of risk identification, ranking and risk assessment procedures that exist today, not all can be used in the field of education, so they must be

substantially redesigned for the needs of educational organizations. At the same time, those that can be implemented, in most cases, educational institutions use only in certain areas, and then fragmentary.

The weak development of the risk management system in educational organizations, observed today, leads to an inadequate assessment of possible risks in the implementation of educational projects, which negatively affects not only the financial performance of a separate educational organization, but also the development of the entire educational sphere. Ignoring or fragmenting the use of risk management leads to such results that do not correspond to the amount of budget funds spent on improving the conditions for the provision of educational services.

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IMPLEMENTATION OF CONTROLLING TECHNOLOGIES AS A METHOD TO INCREASE SUSTAINABILITY OF THE ENTERPRISE ACTIVITIES[*]

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Abstract. We are currently facing that business environment is not stable due to globalisation processes in economics, cyclical changes and other disturbing factors. Hence, it is necessary to search such reserves that would improve efficiency of the business entity. The main objective of these reserves is to buffer negative impacts of external disturbances on financial and economic sustainability of enterprises. One of methods designed to improve the enterprise efficiency involves application of controlling technologies. In the present article the author examines results of statistical analysis of economic performance of more than 70 Russian and foreign enterprises. The author also analyses economic performance according to the author's integral indicator that shows effectiveness of primary implementation of the controlling system. On the ground of this analysis, the author determines the mean level of increase in efficiency of the enterprise's activity due to introduction of the controlling system. The analysis proves that, on average, efficiency of the economic entity's operation increases by about 17%.

Keywords: stability of the enterprise; economic sustainability; financial sustainability; controlling system; controlling technologies; risk; disturbing influences; effectiveness

1. Introduction

Fluctuations of external environment cause economic recession, and in this context socio-economic space is quickly getting more and more diverse. External disturbances significantly affect the state of the industrial cluster, reducing its financial and economic stability. The controlling system is specially designed to neutralize the impact of such disturbances on activities of the economy's terminal segment, the enterprise.

However, today scientists and businesses do not pay sufficient attention to methodological issues in the field of developing and implementing controlling systems, which would serve as the basis for increasing sustainability of economic entities through preventive management aimed to reduce the negative impact of environmental disturbances, i.e. disturbances caused by operational environment (Ghosh *et al.* 2019). The controlling models that currently in use are mainly limited to functions of keeping accounts, controlling and planning. Most of existing models do not forecast what impact environmental uncertainty can have on indicators of financial and economic performance of the enterprise. This phenomenon can be attributed to the history of controlling systems in the Russian Federation – in fact, controlling systems were first mentioned in Russia only after perestroika. The first approaches to introduce strategic management at the economic entity emerged only at the turn of the 21st century. Since then, strategic management has been considered as dominating against the concept of accounting (Pelau and Rosca 2017). Thus, there are objective factors explaining why scientific literature presents practically no quantitative assessment of that influence the introduction of controlling systems has on financial and economic performance of the enterprise. Indeed, few researchers have attempted to quantify the impact of launching the controlling system on business performance, though most of contemporary scientific papers note positive aspects of controlling.

2. Methodological approach

To assess the impact of launching the controlling system on business performance, we need to take the following steps: analyse Russian and foreign experience in this field; process results of this the analysis by means of probabilistic and statistical methods (Zhuravlyov *et al.* 2018); develop integrated indicators that would allow us to come to generalized conclusions as to how introduction of the controlling system improves efficiency, both with regard to certain activities of the business entity and the enterprise as a whole (Khudyakova, Shmidt 2018).

In this context, our research shall comprise the following main stages:
- To collect, summarise and analyse information related to effectiveness of controlling systems (Grynko *et al.* 2016; Parumasur and Govender 2013);
- To calculate statistical indicators based on the data obtained from this analysis (Bertašius 2007);
- To set and calculate integral indicators;
- To make conclusions on the conducted research.

In order to compute the average value of the effect that implementation of the controlling system has on performance indicators of various activities of the enterprise (Shevchuk 2014), we find it possible to use a weighted average indicator:

$$\overline{E_i} = \frac{\sum\limits_{j=1}^{n} (E_{ij} * f_{ij})}{\sum\limits_{j=1}^{n} f_{ij}}, \tag{1}$$

where $\overline{E_i}$ is the weighted average value of increase in i-type efficiency due to launching the controlling system at the enterprise; E_{ij} is the increase in i-type efficiency resulted from launching the controlling system at the j-enterprise; f_{ij} is repetition frequency of j-event; n is the amount (number) of data under analysis.

In addition, it seems necessary to determine the confidence interval for the general average, which would allow with a probability of at least 0.95 to declare that the average value of i-type efficiency increase due to launching the controlling system at the enterprise will not exceed the found interval in case of a gross sample:

$$S_i = \frac{\sqrt{\sum_{j=1}^{n}\left(E_{ij} - \overline{E_i}\right)^2 * f_{ij}}}{\sum_{j=1}^{n} f_{ij} - 1}, \tag{2}$$

where S_i is an estimate of the root-mean-square deviation of the increase in the *i*-type efficiency due to launching the controlling system at the enterprise.

Then the confidence interval for the average value of the increase in i-type efficiency due to launching the controlling system at the enterprise will be calculated with Formula (3):

$$\left(\overline{E_i} - t_{table_i} * \frac{S_i}{\sqrt{n}}, \overline{E_i} + t_{table_i} * \frac{S_i}{\sqrt{n}}\right), \tag{3}$$

where t_{table_i} – is Student's t-criterion.

In order to come to a generalised assessment of the efficiency of launching the controlling system at the enterprise, we propose to use the integral indicator:

$$E_{int.} = \sqrt[m]{\prod_{i=1}^{m} \overline{E_i}}, \tag{4}$$

where *m* is the number of analysed types of indicators that show efficiency of launching the controlling system.

3. Theoretical Framework and Literature Review

Thus, we will analyse the increase of efficiency due to launching the controlling system at the enterprise by applying the above stated methods.

As we have already noted, there are currently no papers providing generalized information on how introduction of controlling influences the performance indicators of one economic entity that could be projected onto a group of homogeneous enterprises (Mousavifard *et al.* 2016). Therefore, we find it essential to make necessary calculations and draw conclusions applying the proposed set of methods.

In their article "Controlling in Russia" founders of controlling in Russia Falco S., Russell K. and Levin L. claim that according to experts estimate, introduction of the controlling system at the enterprise "can result in achieving the growth of integrated performance indicators by 15–30%" (Falco, Russell & Levin 2015). Herewith, introduction of controlling at enterprises engaged in innovative development will increase their efficiency by about 50–75% (Falco, Russell & Levin 2015).

Syuzeva O.V. (Syuzeva 2010), Yunusova D.A. (Yunusova 2009), and Yusupova S.Ya. (Yusupova 2008), Golovanova N.B., Basyuk A.S., Taranova I.V., Kramarenko E.R., Goloshchapova L.V. (Golovanova *et al.* 2016) conducted a research based on official data of the Chamber of Commerce and Industry (The data of the chamber of Commerce of the Russian Federation 2006). Similar conclusions can be drawn based on Suhaimi, Nawawi and Salin's research (Suhaimi *et al.* 2016).

According to their research and the methodological approaches listed above, the effectiveness of made decisions calculated as the increment in profit to the cost increase significantly improved due to the implementation of the controlling system at industrial enterprises. Using the results of their research, we determined that the initial implementation of controlling in Russian enterprises contributed to the increase in the efficiency of decision-making from 11% to 18.9% (Table 1) and the increase in the productivity of managers from 9.6% to 16% (Table 1).

Table 1. Effectiveness of the primary implementing controlling at industrial enterprises (in the short-term)

	Indicator	Rate of increase in the effectiveness of the decision made, %	Growth rate of labor productivity of management personnel, %
initial data	Sistema OJSC	11.0	12.6
	Power Machines PJSC	16.2	16.0
	PJSC Inter RAO	15.0	14.3
	Bishkek Machine-Building Plant OJSC	13.2	9.6
	Holding Company SUIholding LLC	18.9	14.5
	Hals Development PJSC	15.9	12.2
calculated data	Variation range for the indicator value	11.0–18.9	9.6–16.0
	The theoretical mean value	15.03	13.2
	Mean square deviation	2.47	2.04
	Variability index	16.45 (weak variation)	15.48 (weak variation)
	Integrating efficiency indicator	14.09	

Source: compiled by the authors based on
(The data of the Chamber of Commerce of the Russian Federation 2006, Syuzeva 2010, Yunusova 2009)

At the same time, the efficiency of decisions is understood as the ratio of the increase in the value of the surplus product as a result of the implementation of a specific management decision to the increase in costs caused by this management decision. In our case, these solutions are understood as actions aimed at the formation and implementation of the controlling system in industrial enterprises. The increase in the productivity of managerial

personnel is understood as an increase in the indicator calculated as the ratio of the products produced to the number of managerial personnel.

Thus, the theoretical mean value for increase in efficiency of the made decision amounts to 15.03%, while the theoretical mean value for increase in the labour productivity of managerial personnel amounts to 13.2% (Table 1).

The calculations presented in Table 1 bring us to conclusion that the theoretical mean value of increase in the efficiency of the decision made and labour productivity in the given sample are almost identical. Herewith, the calculated coefficients of variation are not significant (<30%), thus, the input data for analysis are considered homogeneous, which allows us to conclude that the calculations are valid. The integral indicator of increasing the efficiency of Russian enterprises due to implementation of the controlling system in the short term is 14.09% (Table 1).

In the long term the increase in the enterprises efficiency due to implementation of the controlling system is higher than in the short term (Table 2). For example, for Russian enterprises the integral indicator of efficiency of the controlling system in the short term varies within 14% (Table 1), while in the long term it doubles and amounts to 32.46% (Table 2). At the same time, it is necessary to note that the quality of decisions is calculated as the ratio of the number of qualitatively executed decisions to the total number of management decisions taken at the enterprise.

Table 2. Efficiency of making long-term financial decisions based on primary controlling activities

	Company / Indicator	Growth rate of increase in quality of decisions, %	Growth rate of management effectiveness, %
initial data	Luding LLC	43.4	38.7
	SPI-RVVK OJSC	41.1	36.9
	Locator LLC	34.5	30.6
	Uniastrum Bank PJSC	32.2	29.8
	Solid CJSC	18.9	18.9
calculated data	Variation range for the indicator value	18.9–43.4	18.9–38.7
	The theoretical mean value	34.02	30.98
	Mean square deviation	8.61	6.96
	Variability index	25.3 (weak variation)	22.46 (weak variation)
	Integrating efficiency indicator	32.46	

Source: compiled by the authors based on (Syuzeva 2010, Yunusova 2009)

According to the research conducted by the international company PricewaterhouseCoopers (The Pricewaterhouse Cooper's bulletin, 2002), analysis of the impact of implementing the controlling system at foreign enterprises proved that the trends are similar to those in Russia (Table 3).

Table 3. Efficiency of primary implementing the controlling system at foreign industrial enterprises

	Company / Indicator	Growth rate of management effectiveness, %	Rate of increase in the efficiency of the production process, %
initial data	Sony	25.0	18.4
	Samsung	24.2	18.0
	LG	18.7	25.9
	Akai	11.8	8.4
	Kodak	11.7	31.9
	Nokia	10.2	25.3
	Mazda	9.9	22.9
	Siemens	9.3	21.5
	British Petroleum	9.1	19.6
	Shell	8.6	19.0
	AIG Brunswick Capital	7.2	14.9
calculated data	Variation range for the indicator value	7.2–25.0	8.4–31.9
	The theoretical mean value	13.25	20.53
	Mean square deviation	6.06	6.17
	Variability index	45.74 (moderate variation)	28.65 (weak variation)
	Distribution type	normal distribution	normal distribution
	Integrating efficiency indicator	16.49	

Source: compiled by the authors based on (Yunusova 2009; The Pricewaterhouse Cooper's bulletin, 2002)

Checking samples for normality of the statistical law made it possible to conclude that the values of growth rates of management efficiency and the production process are normal. Herewith, the theoretical mean value for the increase in management efficiency at foreign industrial companies amounts to 13.25%, while the increase in efficiency of the production process amounts to 20.53%. At the same time, the calculated integral index is 16.49% (Table 3).

Analysis of changes in performance indicators at foreign industrial enterprises resulted from introduction of controlling systems (Table 4) allows us to indicate the following positive trends in the development of these economic entities. Firstly, implementing this or that kind of controlling allowed enterprises to increase, on average, the level of investment attractiveness practically up to 9%. Secondly, on average it allowed to increase efficiency of documents circulation practically up to 10%. Thirdly, on average it allowed to increase financial stability by more than 8%.

Materials of the analytical department of the State Duma of the Russian Federation for monitoring and financial monitoring (Materials of analytical Department of the state Duma of the Russian Federation for control and financial monitoring 2004) present another official source, which provides data on implementation of the controlling system at foreign enterprises. Analysis of this source brings us to conclusion that the level of investment attractiveness resulted from implementation of the controlling system at the enterprise increases on average by 8.9%, the efficiency of document circulation increases by 9.7%, the level of financial stability increases by 8.3% (Table 4).

Table 4. Dynamics of performance indicators at foreign industrial enterprises resulted from primary implementation of controlling

	Company	Growth rate of the level of investment attractiveness, %	Growth rate of workflow efficiency, %	Growth rate of financial stability, %
initial data	British Petroleum	+11.4	+5.2	+6.3
	Tesco	+9.3	+11.6	+8.9
	METRO GROUP	+7.2	+15.3	+22.1
	Cristall Gross	+6.5	+11.3	+22.5
	Ford	+1.2	+14.8	+6.3
	Mazda	+16.8	+27.6	+9.9
	Bayer AG	+3.5	+5.2	+2.2
	Schwarzkopf	+6.3	+8.9	+9.3
	Oriflame	+3.3	+9.3	+5.7
	Motorola	+6.8	+9.3	+11.0
	Chivas	+3.9	+1.6	+5.2
	Huawei	+16.5	+11.9	+3.5
	Ziegler	+0.2	+0.96	+0.45
	Singer Corporation	+1.6	+2.9	+3.6
	Renault	+13.3	+6.9	+9.2
	IBM	+33.9	+11.8	+6.9
calculated data	Variation range for the indicator value	1.2–33.9	0.96–27.6	0.45–22.5
	The theoretical mean value	8.86	9.66	8.32
	Mean square deviation	8.16	6.28	5.99
	Variability index	92.1	64.99	72.05
	Integrating efficiency indicator	8.93		

Source: compiled by the authors based on (Materials of analytical Department of the state Duma of the Russian Federation for control and financial monitoring 2004, Yunusova 2009)

At the same time, the efficiency of the document flow is understood as an indicator calculated as the ratio of profit growth as a result of the introduction of measures improving the document flow process in the enterprise to the increase in costs due to innovation. Financial stability of the enterprise (Table 4) is determined on the basis of the coefficient of autonomy and is calculated as the ratio of the own funds of the entity to the currency of its balance sheet.

Thus, analysis of growth rates of investment attractiveness, efficiency of document circulation, financial stability of foreign industrial companies allows us to conclude that the introduction of this or that kind of controlling contributes to improving an economic situation at the enterprise and increasing its efficiency. Besides, though growth rates of indicators vary from a company to company, we observe that a general change dynamics for all analysed enterprises is positive. The resulting conclusion is that introduction of controlling systems at industrial enterprises makes it possible to increase the level of stability of the economic entity (Table 4), which is especially important in the context of recession.

At the same time, a number of researchers note the positive impact of introduction of controlling technologies on other financial, technical and economic indicators of the enterprise performance. For example, Asaul A.N., Starovoitov M.K. and Faltinsky R.A. point out in their work that the rate of increase in the sales volume due to implementation of controlling will amount to 20%, net profit – to 2%, and the shareholder value – to 100% (Asaul, Starovoytov, Faltinsky 2009). Moreover, the authors examine controlling in the limited framework of budgeting. Obviously, in its full capacity controlling is expected to produce even a more significant effect (Mateljak and Mihanović, 2016).

The company AT&T Canada, the largest mobile operator in Canada, which implemented the Balanced Scorecard System (BSC), serves as another illustration of high efficiency of controlling for the enterprise. After the system was launched, the company showed the following performance dynamics: the trading profit increased by 15%, the output per worker increased by 11%, the market value of the enterprise showed 4 times growth. One more evidence is introduction of the controlling system at the Airbus Group, which in 2015 caused an increase in the turnover profitability by 10% (Hubert, Falco 2015).

4. Result

Overall, in the course of the research the author analysed increasing the efficiency of performance resulted from introduction of the controlling system at more than 70 Russian and foreign enterprises.

Giving a quantitative assessment of the impact of the controlling system introduction, it is safe to say that the introduction of the controlling system has a positive impact on the indicators of efficiency and profitability of enterprises. This means that the increase in profit as a result of improved management based on controlling exceeds the increase in the cost of these changes in the management system. Summary indicators of the analysis are presented in Table 5.

After analyzing the results presented in table 5, it is safe to say that the introduction of the controlling system in those enterprises that have not previously used it can have a significant positive effect by increasing the overall efficiency of the enterprise. Also, during the crisis and the increased uncertainty of the external environment, the introduction of the controlling system will become a buffer reducing the negative impact on the financial and economic performance of the enterprise.

Table 5. The impact of introduction the controlling system on performance of the enterprise

Indicator	The rate of increase in the effectiveness of made decisions, %	The rate of increase in managers' productivity, %	The rate of increase in management effectiveness, %	Rate of increase in the quality of decisions, %	The rate of increase in efficiency of the production process	The growth rate of financial stability,%
Variation range for the indicator value	8.7–18.9	9.6–17.2	7.2–38.7	18.9–43.4	8.4–31.9	0.45–22.5
The theoretical mean value	13.60	13.39	18.52	34.02	20.53	8.32
Mean square deviation	2.86	2.48	9.6	8.61	5.88	5.99
Variability index	20.99 (weak variation)	18.54 (weak variation)	51.82 (moderate variation)	25.30 (weak variation)	28.65 (weak variation)	72.05 (strong variation)
Distribution type	normal distribution	normal distribution	normal distribution	normal distribution	normal distribution	abnormal distribution
Confidence interval for the mean (significance value α=0.05)	(11.45; 15.75)	(11.52; 15.26)	(13,77; 23,27)	(22,08; 45,96)	(16,39; 24,67)	(5.02; 11.62)
Confidence interval for the mean (significance value α=0.01)	(10.51; 16.69)	(10.7; 16.08)	(12.01; 25.03)	(14.21; 53.83)	(14.64; 26.42)	(5.02; 11.62)
Integrating efficiency indicator	16.42					

Source: own compilation

5. Conclusions

Having analysed the works containing a quantitative assessment of the effectiveness of implementing the controlling system at the enterprise, we found it practical to draw the following conclusions.

Introduction of controlling makes it possible to increase the effectiveness of made decisions by 8.7% – 18.9%. Moreover, it should be noted that with a probability of 95% the value of the analysed indicator falls in the range from 11.45% to 15.75%. Moreover, probability of the fact that the effectiveness of the decision will the increase within the range from 10.51% to 16.69% amounts to 99%. Herewith, we can also observe an increase in the productivity of managerial personnel from 9.6% to 17.2%. As for this indicator, the findings are that with the probability of 95%, its value falls in the range from 11.52% to 15.26%, and with the probability of 99% it falls in the range from 10.7% to 16.08%. The increase in management efficiency ranges from 7.2% to 38.7%. Besides, we note that with the probability of 95% the value of the analysed indicator falls in the range from 13.77% to 23.27%, and with the probability of 99% it falls in the range from 12.01% to 25.03%. The quality level of made decisions is also growing, while the increase has a spread across the analysed enterprises from 18.9% to 43.4%. For this indicator, its value falls within the range of 22.08 – 45.96% with the probability of 95%, and with the probability of 99% it will fall in the range from 14.21% to 53.83%. Introduction of the controlling system at the industrial enterprise results in an increase of the efficiency of the production process by 8.4% – 31.9%. For this

indicator, with the probability of 95%, this value falls in the range of 16.39–24.67%, and with the probability of 99%, it falls in the range of 14.64–26.42%.

Generalization of the obtained results allows us to calculate the integrated indicator of the effectiveness of introduction of the controlling system at the industrial enterprise, which amounted to 16.42% (Table 5).

The obtained results lead to a logical conclusion that introduction of the controlling system at the enterprise is an effective method, which becomes especially relevant in the context of globalisation of economy and growth of disturbances in the external environment. The reserve, allowing to enhance business efficiency, identified when applying the controlling system, can and must act as a sort of a buffer designed to reduce negative impacts that external environment factors make on sustainability of the enterprise (Pozdnyakova *et al.* 2017).

Moreover, we believe that we should apply an integrated approach to launching the controlling system. It implies taking into consideration financial and economic aspects, use of certain advanced features designed to include not only functions of control, accounting and budgeting, but, in the first place, the function of preventive business management in a variable environment based on scientific simulation models. In this case, the enterprise will not only increase the effectiveness indicator of launching the controlling system, but also eliminate probability of losing financial and economic sustainability of the mini-economic system.

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TARGETS DETERMINATION MODEL FOR VAT RISKS MITIGATION AT B2B MARKETPLACES

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Abstract. The objective of the study is to assess practical requirements for VAT implementation in relation to B2B e-commerce participants for the development and practical implementation of target determination model, considering the mitigation of tax risks associated with transactions on digital marketplaces, taking into account data disclosure upon corporate reporting submission. It was determined in the course of scientific and practical study of the specifics of implementation and payment of indirect taxes, that there is no general methodological approach to indirect taxation of international services accomplishment in the field of B2B e-commerce, due to the differences in the indirect taxes applied: VAT or retail tax. In this regard, the hypothesis is proposed that the provision of optimal tax conditions for electronic marketplaces to a considerable degree is fraught with the shift in business opportunities towards B2B transactions in tax jurisdictions, providing equal conditions for non-residents. In terms of international practice, the study is of significant interest as the experience of introduction of VAT implementation and payment in relation to B2B operations, VAT-exempt transactions, given that the tax and regulatory system of the jurisdiction under study is assessed as a system with increased business risks. The above calculations showed that B2B non-resident is in unequal conditions compared to the taxpayers of a particular jurisdiction, and the difference in the calculated VAT value is significant. However, the introduced obligation to pay VAT has not provoked the non-residents to move to the e-commerce marketplace of other tax jurisdictions. The risk zones identified during the study determined the essential need to build an optimal model on digital marketplaces, which, in our opinion, can be the basis for the development of the targets for mitigation of the tax risks associated with VAT payment on B2B marketplaces. In our opinion, the proposed model is universal for all business management systems and applied ERP systems, taking into account the provision of all parties in B2B transactions with access to information. According to the results of the study, it was determined that the disclosure of information on B2B operations, indirect taxes and tax risks in corporate reporting is not imputed by the regulators and has a largely inconsistent and unstructured nature. In this regard, any proactive disclosure in corporate public reporting on B2B is possible only if the company treats the information requests from external users as significant, taking into account the calculation of the cost of preparation of the information, which does not exceed the expected effects.

Keywords: digital economy; electronic commerce; indirect taxes; VAT; tax base, tax rates; tax optimization; tax jurisdictions

1. Introduction

The digital economy segment is a relevant area of research due to significant changes in the international business sphere. The emergence of new business communication technologies, electronic platforms allow the producers of goods (works, services), and the purchasers to reduce the transaction costs associated with the interaction. Companies from around the world use the electronic marketplaces to promote their products, getting the opportunity to expand the list of loyal customers, increase the sales and the amount of income without additional significant investment. Electronic trading platforms can be considered as a convenient and affordable service for all types of business, as the organizations get the opportunity both to sell goods to end customers on B2C or C2C models, and to conclude large and small wholesale transactions on B2B and B2B2C models. For commercial needs, a business management center may be located in one country, while the information and processing can be stored and performed in another country or other countries (Tarman, 2018; Plaskova et al., 2017). This is characteristic not only for multinational corporations with an extensive structure of the parent and controlled companies, but also for small one-component companies, which in certain jurisdictions will relate to small and medium-sized businesses. In this regard, there are several problems associated with the jurisdiction of the transaction in the event of a conflict of interest. One of the issues to be discussed is the procedure for indirect tax implementation (Leonteva et al., 2018). Historically, the EU, USA and emerging market countries have different taxation systems, primarily indirect taxation ones. At the same time, the international experience in B2B e-commerce taxation is characterized by different approaches to the procedure for their implementation and payment, since the Internet commerce is characterized by a cross-border feature of operations and the absence of physical borders, moreover, it is quite difficult for tax administrations to link the sales of services to the territorial jurisdiction of a particular country (Korableva et al., 2018; Singareddy et al., 2019). Also, any geographical location may be the place of origin of the electronic services provided (Peacock A. 2012). To a large extent, the groups of countries belonging to the EU, as well as the United States and the countries with developing markets have different approaches to the procedure for determination of the object of taxation and withholding of indirect taxes. Moreover, the common denominator is the revenue side of the state budget, determined by the jurisdictions using their approach, giving the main role to the tax administration of the regulatory authorities.

Practically, most countries implement indirect taxes on all goods supplied to their jurisdiction. In addition to indirect taxes payment, there is an obligation to pay customs duties (in respect of goods), taking into account the threshold values established by each country. To a large extent, this method of the chosen fiscal policy is the modern trend in the e-commerce recommended by the OECD as the provision of optimal compliance with the regulation of world cross-border trade. At the same time, according to Asongu (2012), the introduction of various tax mechanisms makes it possible to level the tax burden between the residents and non-residents to a certain extent. However, maintaining a balance between the interests of the state and taxpayers, in our opinion, should not make the non-residents lose their interest in local sales markets, while ensuring fair competition for the residents of a particular country in the field of B2B e-commerce. Since the current mechanism for indirect taxation, as a rule, contains a general taxation function – fiscal one, it is important to observe the interests of the subjects of the e-commerce tax process – organizations that are participants in B2B, B2C.

Another issue that needs discussion is the access to information for all parties interested in the B2B transaction process. This refers to the world's leading participants, providing audit and consulting services, including in the field of taxation and legal services, as well as in the field of market research, monitoring and forecasting, including the disclosure of information elements in corporate reporting in various segments (Kosorukov and Maksimov, 2016). One of these segments, the information on which is of interest to the stakeholders, is the services provided by B2B (Besley, 2013). In particular, epizootic disclosures by some companies in financial or other types of reporting, as a rule, do not provide sufficient material to determine the vector of change in the

indicators for the B2B segment. Moreover, in the studies and analytical surveys on market monitoring and forecasting, performed by the companies, it is noted that some companies try not to disclose the information on the size and dynamics of services in the B2B segment (Keen, 2010). As a rule, this is a consequence of non-disclosure in order to maintain a competitive advantage. However, the disclosure of the information on the B2B sector in the statements of the companies may be associated with the company's own tax risks. This predetermines the growing interest of numerous stakeholders in the order of influence of taxation on the business as a whole. If the legislation of a particular jurisdiction does not provide for the disclosure of the information on certain sectors, then the decision belongs to the sphere of professional judgment of the reporting compilers and company management. In our opinion, due to large-scale changes in the digital segment of the B2B economy, general approaches to the disclosure of the information should be defined. At the same time, the interests of both the users and reporting compilers should be taken into account.

On the basis thereof, the purpose of this study is to assess the practical aspects of VAT implementation and develop a targets determination model for mitigation of the tax risks associated with the transactions on digital marketplaces and their disclosure in corporate reporting.

2. Literature review

In most scientific studies concerned with the problems of electronic commerce taxation, B2B is characterized by the consideration of theoretical aspects, taking into account the obtained empirical data, the procedure for indirect taxes implementation and payment. The nature of progressive development is common to B2B trade, as the individual countries, China in particular, have not made a final decision at the legislative level on the method of taxation of the cross-border transactions.

The study of the degree of influence of the indirect tax – VAT – on trade volumes is focused on a distortion of competition and injustice of taxation for both residents and non-residents in the B2B segment. For example, in a study carried out by Bach (2000), if foreign providers sell the services to end consumers via the Internet, then VAT should be implemented in the country where such services are consumed. The largest contribution to the consideration of the theoretical aspects of the e-commerce taxation of B2B and B2C in the EU countries is summarized in the studies carried out by Silva (2014), in which the current European tax legislation regarding cross-border transactions for the companies operating within the EU member states is overviewed most thoroughly. At the same time, the current European system of VAT implementation on cross-border trade is to a greater extent a significant barrier to entry into the common market for small businesses (Keeny, 1999; Dunets et al., 2019; Peshkova et al., 2017). In our opinion, this circumstance is quite justified, since there are differentiated threshold restrictions for all categories of taxpayers. For example, the revenue per year varies from 5300 Euro in Norway, 50 000 Euro in Latvia. When paying VAT in the country of destination, the difference in the current tax rates between the country of origin (for example, in Hungary the rate is equal to 27%) and destination (for example, in Luxembourg the rate is equal to 17%) is significant. According to Papagiannidis (2008), in this case, sales companies are more likely to be registered as a taxpayer to pay the tax in the country of destination where a lower VAT rate has been introduced.

Despite the harmonization in the EU countries in accordance with the Sixth Directive, tax legislation contains, according to Kaplan (2009), a complex procedure for determination of the object of VAT taxation, a heterogeneous approach to different categories of taxpayers, and, given Schlosser (2006) studies, the situation is aggravated by the differences in the internal regimes of EU member states (by their own regulations). At the same time, the scientific research by Rene (2009) are addressed these problems in the early stages of building of the all-European construction for indirect taxation and double taxation regarding gambling in the Netherlands, carried out via the Internet and managed by the companies located in other jurisdictions.

At the same time, the current practice of taxation in the EU countries contains a general tendency: to obtain the right to a VAT tax deduction paid in the EU countries, in most cases non-resident companies engaged in electronic services, to a greater extent, receive an incentive to transfer to the EU jurisdiction with the opening of a permanent representative office. In our opinion, this factor is relevant, since it excludes the nature of double taxation on indirect taxes. However, the VAT refund mechanism for non-EU residents to a greater extent is not applied by its own national tax law. The point at issue is the impossibility of application of the VAT tax deduction paid to the budget of a foreign jurisdiction when filing a tax return in one's home nation, i.e. B2B organization is not entitled to reduce the calculated VAT on internal sales of goods (services) by the amount of tax paid outside its jurisdiction. This approach is described in sufficient detail in the methodological studies of Yapara (2015), noting an important aspect of the taxation problem, when suppliers and consumers – B2B participants are in different jurisdictions, the principle of uncertainty and double taxation on VAT arises (Sazanov and Akhmetshin, 2016; Sharafutdinov et al., 2018). Therefore, this is an extremely negative aspect of the further development of e-commerce in the global world. In continuation of this study, in our opinion, the uncertainty in the procedure for application of the indirect tax deduction is significant if, for example, VAT is applied in one country and the sales tax is applied in another. The possibility of solution of this problem, according to Dhillon (2007), is in the plane of concluding individual agreements on the avoidance of double taxation on indirect taxes.

However, the fast pace of development of global B2B trade between countries prevents the tax laws of national jurisdictions from timely practical legalization. In particular, the negotiations on an international scale regarding the submission of tax reporting on FATCA foreign accounts, introduced by law in the United States in 2010, were adopted by the European countries only in 2014, and by some countries of the Asian sector, in particular Vietnam, in 2016 (Borowiecki, 2018). Agreement processes on country-by-country reports or CbCR also have not been completed for many countries. Unlike the FATCA mechanism, which obliges financial companies to unilaterally submit the information directly to the US tax service, the exchange of financial information within the framework of CRS is mutual and is carried out between the tax services of the participating countries (Brazys, 2017). Consequently, the local tax authorities first accumulate the information at home, and subsequently carry out an equivalent exchange between the countries (Maguth and Koskey, 2019; Trofimova et al., 2019; Goloshchapova et al., 2018; Voronkova et al., 2019; Sasongko et al., 2019).

Another global problem related to B2B indirect taxation, according to Cui (2010), is the tax rates change frequency at the state level. In particular, in the United States, another indirect tax is applied – the retail sales tax, which in 2018 changed 619 times both for specific types and goods (Prosser, 2016; Goryushkina et al., 2018) and at the level of the states themselves, cities and local jurisdictions. Consequently, the procedure for determining the correct sales tax rate for the final B2B product in various tax jurisdictions is complicated (Dincecco, 2016), since the manager needs to determine the rules of which jurisdiction-country to apply to each online transaction, depending on the location of the buyer and seller. In this regard, with a greater degree of probability, it can be argued that tax functions in the global world often conflict with the current taxation procedure in a particular country (domestic tax law) and the transfer of taxation of cross-border electronic commerce in jurisdictions to the location of the final buyer.

At the same time, according to Bastiaens (2016), the expansion of the degree of influence of e-commerce in the global B2B space from China, at the legislative level, a legal mechanism for charging VAT for subjects of this sector of the economy has not been formed. Despite the current procedure for VAT implementation and payment at the basic rate of 17%, tax losses in the field of electronic commerce in empirical studies by Wei (2018) only for 2017 amounted to 30% of the total tax revenue to the country's budget. In this regard, the method of taxation of the electronic commerce proposed by him – the delegation of the tax agent functions to a cybermediary (to a third party) will make possible more substantial expansion of the information on electronic transactions on the Internet, as well as the reduction of the number of tax audits conducted, improving the quality of tax administration

(Lebedeva et al., 2016). At the same time, it is proposed to carry out the relations between third parties and tax authorities on a paid basis, which, in our opinion, will create an unnecessary additional corruption component between the subjects of tax relations. However, according to Wei (2018), the information received should be reflected in the framework of reporting under IFRS. But there are a number of obstacles. Firstly, not all jurisdictions recognize the IFRS standards and not all companies, including voluntarily, prepare reports on these standards. Many companies are limited to national standards close to the IFRS, for example, US GAAP. Secondly, in the practice of the company, other types of reports are compiled, which are mandatory or compiled voluntarily by the companies, according to best practices. Based on the zero point, the need for the separation of property, according to He (2009), for the purpose of doing business, predetermined the appearance of establishment in the form of a legal entity. In the modern interpretation, in the presence of certain features, such as the participation right, the right of the owners to control and manage the capital is implemented in the form of a corporation. A corporation, which can be an independent enterprise or a group, has a common goal, objectives, strategy, and corporate ethics (Timothy, 2017). Accordingly, all business information of the corporation will be provided through corporate reporting (Korableva et al., 2019). One of the types of corporate reporting, which is considered by many authors as a new evolutionary approach to the presentation of financial and non-financial information (Adams, 2011), is the integrated reporting. The authors' studies are focused on the formation of the structure of this type of report, the value of information for the users, including the analysis of the copyright works in the fields of integrated reporting (Rinaldi, 2018). The submission by the individual companies of extended reports on the digitalization of activities, the research on the information interests of the client base by large audit companies, the reports on the development of the B2B market by market research companies, indicate that the approaches to disclosure of the information on B2B companies in corporate reporting are quite relevant.

3. Theoretical background

In general, the following basic online trade models were developed based on international B2B taxation practice.

- Classic model – according to which a legal entity must be registered as a taxpayer in the respective country. Both domestic and imported goods are sold. When importing, full customs clearance is performed and internal customs rules and tax legislation are applied. As a rule, when the classical approach is used by the electronic marketplaces, online shops are required to pay customs duties and VAT when importing, as well as ensure technical compliance (certification), service (service centers), legal support (consumer protection). Moreover, compliance with the law directly affects the increase in the price of imported goods sold.
- Cross-border model – does not require the registration of a legal entity in the territory of a particular country as a taxpayer. In this case, the import of goods is carried out through international postal services directly to the end customers (individuals). To a greater extent, foreign online marketplaces are used in the form of intermediaries in the sale of goods in the territory of a particular country (Shatunova et al., 2019). At the same time, foreign online marketplaces transfer the tax and customs burden to the final recipient. In particular, when shipped by international postal services, the duty-free import limit for goods for individuals for personal use between the EAEU member countries since 2019 has been equivalent to the national currency to 500 Euros (in 2020 it will be reduced to 200 Euros) or 31 kg of weight per 1 person per calendar month (Ponomareva, 2019).

It should be noted that in fact the majority of goods imported in a cross-border way is provided by a facilitated duty-free import regime, which affects directly the competitiveness of local and foreign online stores. Thus, cross-border transactions in EU countries are carried out in compliance with a general procedure, regulated by the Customs Code of the European Union, establishing the exemption from VAT on parcels worth not more than 22 Euros (each state varies in value), and gifts worth not more than 45 Euros. Individuals are exempted from customs

duties at parcels worth not more than 150 Euro per unit (Seelkopf, 2016). However, in our opinion, these rules discriminate the non-residents of the EU.

In the field of B2B e-commerce services, there is no general methodological approach to indirect taxation in the field of international B2B e-commerce services (Rixen, 2011). This is primarily due to the differences in applicable taxes: VAT or retail sales tax. Moreover, often e-commerce is cross-border and one of its key features is the lack of physical boundaries. In this case, the place of origin of the service provided is not tied to a particular jurisdiction. In this case, the lack of a common approach, in our opinion, is a serious problem for B2B participants located in different jurisdictions. Another problem of B2B e-commerce is the determination of the place of permanent representative office in case of commercial activities in the digital space. So, for the establishment of a permanent representative office in accordance with the generally accepted concept developed by the OECD, a permanent place of business is required. Such a place of business also requires a physical presence in the country. Traditionally, organizations had a physical presence in a country due to the existence of an office or point of sale, which made it easy to determine their presence using a specific geographic point (Wahl, 2010). However, the companies operating in the digital space do not have to open an office to conduct business in another jurisdiction. In this regard, the main problems of VAT administration in the field of electronic services are related to the taxation of cross-border transactions in the B2C segment, i.e. the procedure for delivery of the services from the company to the buyer (Thalassinos et al., 2012; Romasheva et al., 2018). These issues are mainly related to the determination of the jurisdiction in which the tax should be paid, taking into account the identification of the tax base. In this regard, consider the main features of the regulation of indirect taxation.

Features of VAT regulation in the field of e-commerce in the EU
Generally, in the case of B2B services, the VAT object of taxation is determined based on the location of the recipient of such services (the customer). Subject to the provisions of the Sixth Directive, the place of service rendering to a taxable person shall be the location (residence) of the recipient of such services (the customer). If service rendering is carried out by a permanent representative office of a taxable person located in a place other than his location, the territory of the permanent representative office shall be recognized as the actual place of service rendering.

In general, the B2C services provided are subject to VAT at the location of the provider. In this case, the place of service rendering to non-taxable persons shall be recognized as the location of the provider (Bittman et al., 2017). In the case of service rendering through the permanent representative office of the provider, the object of taxation will be recognized at the location of the permanent representative office. At the same time, when rendering B2B, B2C services, there are several exceptions concerning the procedure for determination of the VAT object for certain types of operations, for example, real estate, passenger transport, restaurant and catering services, auxiliary services, etc. Thus, to determine the VAT object, providers must have information about the status of the customer (is the customer a taxable or non-taxable person) and its physical location (Rupeika-Apoga et al., 2018). A distinguishing feature should be defined in the procedure for VAT calculation and payment in the EU countries when providing B2B services by using the concept of Reverse Charging VAT, which is as follows. The customer of the service, when filing a VAT tax return in his country, accrues the VAT payable to the budget at the local rate and simultaneously presents the amount of tax deductible. This can be applied by the recipient of the B2B service if the recipient is registered as a VAT payer (has the VAT number) in the relevant EU country. In this case, the recipient of the service must first inform the B2B provider of an individual identification number for verification on a common basis and for compliance with valid information about the counterparty.

In practice, this solution has been successfully applied by the established agency companies based on digital solutions that automatically retrieve sales data of a seller or any accounting software to generate electronic VAT returns in the MOSS system (Hyman, 2015). It should be noted that in cross-border transactions, the MOSS

mechanism allows the taxpayers engaged in cross-border transactions within the EU not to register in each jurisdiction, but to submit VAT returns only in the country in which they have a permanent office.

For legal entities not located in the EU, the obligation to pay VAT in the territory of an EU member state also applies if the consumer of the goods sold is physically located in the EU. In this case, the non-resident of the EU is not entitled to apply a VAT tax deduction for the amount of tax paid in the EU country, which, in our opinion, leads to non-competitive pricing policy in the local market. Moreover, the current VAT audit rules are not harmonized in the European Union (Brülhart, 2014). This circumstance causes the risk of double taxation for non-residents of B2B.

Features of tax and customs regulation in the field of electronic commerce in the USA
The USA can be characterized in the field of electronic commerce by the application of tariff and non-tariff regulation measures, taking into account the interests of domestic manufacturers. Like any other country, they apply most favored nation treatment and preferential import in the form of special duties, while the rates vary up to 37% (Lindvall, 2011). In the case of sales, a sales tax is levied on the price, the rates of which depend on the type of goods and the territory of a particular state, the maximum rate is 11.5%. When purchasing from e-commerce non-residents, the individuals are required to pay customs and tax duties, and the threshold for duty-free import is not more than 800 US dollars (provided that the goods are not subject to quotas or prohibitions), the parcels worth up to 2 000 US dollars should be accompanied by the inventory indicating the amount of the duty. Subject to the permission of the U.S. Supreme Court, since July 2018, sales tax on online trading may be withheld in the states, the rates of which vary from 2.9 to 8.3%. At the same time, the current practice of self-declaration by an individual based on the results of the tax period did not allow to exercise proper control over the purchases by tax administrations. Consequently, withholding sales tax from sales by the company will make it possible to level the competition between conventional retail chains and online trading.

Features of VAT regulation in the field of electronic commerce in Russia
In Russia, a foreign B2B organization (an electronic services provider or an intermediary) mandatory computes and pays VAT for all transactions, regardless of the buyer of electronic services, that may be the individual, legal entity or the individual entrepreneur (B2C, B2B). In terms of the state, the main goal of VAT tax legislation amendment was to ensure the competition between Russian participants and foreign participants, who 2017 did not have to pay tax to the Russian budget until October (Lymar, 2018). In the current unfavorable macroeconomic conditions of the Russian economy, due to the equalization of the tax burden in B2B e-commerce sales when providing services in electronic form, the VAT rules were adjusted in favor of Russian B2B taxpayers (Karpova, 2018). Thus, the current procedure for the implementation and payment of the value-added tax is established when providing the individuals with the services in electronic form on the territory of the Russian Federation for:
a) foreign organizations, except for the provision of services through the established separate division in the territory of the Russian Federation;
b) intermediaries of foreign organizations (tax agents) engaged in entrepreneurial activities based on commission agreements (commissions, agency agreements, etc.).
At the same time, the changes in the taxation procedure affected the key foreign taxpayers subject to mandatory tax registration with the territorial bodies of the Federal Tax Service of Russia, in particular, "Google LLC.", "Apple Inc.", "Microsoft Corporation"; "eBay Inc." and "AliExpress", specializing in the organization of online stores as well as online marketplaces for the sale of computer games "Steam", etc. As an object of taxation for non-residents of B2B, a closed list of types of services provided in the Russian Federation is used when selling the electronic content in the form of:
a) programs, games, applications and databases, including their updates, as well as the rights to electronic books, graphic images, music, etc. ("Digital goods");

b) when conducting online auctions, providing hosting services, storing databases, providing access to search engines on the Internet, registering domain names, administering information systems and sites on the network, etc.

Thus, tax regulation in the field of B2B e-commerce is aimed at balancing the tax burden between residents and non-residents.

4. Data analysis

The countries with developing market are characterized by the continuity of market mechanisms used in international practice to achieve a unity of approaches to the intercountry economic relations. The introduction of VAT in the territory of post-Soviet countries and Southeast Asia, for example, North Korea, India, is not the exception. The VAT was chosen instead of another indirect tax, for example, sales tax because VAT makes it possible to create a system compatible with European countries. For individual countries that view EU accession as the next stage of their economic reform, this is a prerequisite for joining the European Union. Moreover, the unity of approaches in the implementation of indirect taxes will contribute to the development of transnational business, as well as small and medium-sized enterprises, regardless of whether or not the country belongs to the EU.

The development of digitalization of the company, the provision of optimal tax conditions on electronic marketplaces can lead to a shift of business to transactions in a certain jurisdiction. In international practice, the experience of introducing VAT for transactions on B2B marketplaces where the transactions used to be VAT-exempt, may be interesting. In this case, there are reasonable assumptions that a number of companies may consider that the share of revenue attributable to this geographical sector of the economy is not significant and decide to trade on another e-market.
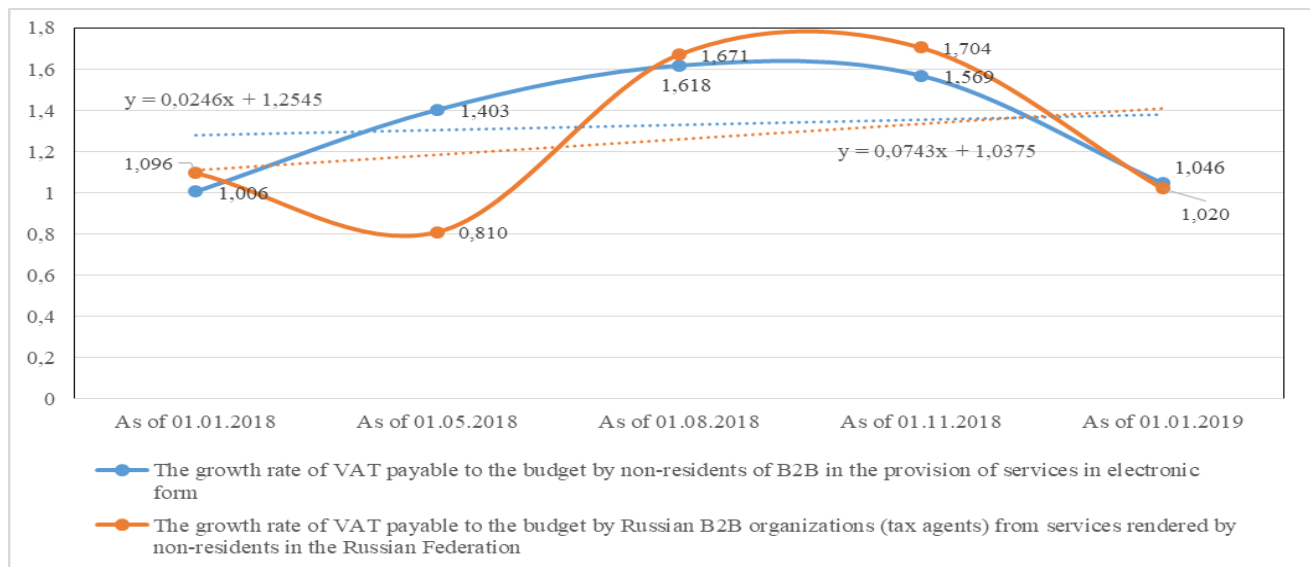
Fig. 1 Dynamics of the growth rate of the amounts of VAT payable to the budget of the Russian Federation by B2B payers. Compiled by the authors on the basis of the data provided by the tax service of the Russian Federation
Source: https://analytic.nalog.ru/portal/index.en-GB.htm

Consider the dynamics of the growth rate of the amounts of VAT payable to the budget by B2B non-residents and B2B tax agents (residents) from the moment of the introduction of tax legislation (submission of quarterly VAT returns) in relation to the provided electronic content services (Fig. 1).

The general dynamics of growth rates calculated using the general economic method of chain substitutions for the period 01.01.2018–01.01.2019 indicates a slowdown in the growth of tax revenues primarily from Russian B2B payers (Fig. 1). The calculation of the average growth rate of VAT tax revenues from taxpayer residents amounted to 0.9822. This calculation is made according to the following average formula:

$$\overline{Tp} = \sqrt[n-1]{\frac{Yn}{Y1}} \qquad (1)$$

where n – number of calendar quarters,
Yn – current indicator,
Y1 – base indicator for January 1, 2018.

In turn, the average growth rate of VAT tax revenues from B2B non-residents, calculated using formula (1), amounted to 1.0099, which is characterized by a sustainable reaction and unchanged decisions in the development of the Russian market of electronic content services, even due to an increase of the basic VAT rate since January 01, 2019. It should be noted that despite the decrease from 1.5688 to 1.0461 in the growth rate of VAT tax revenues from B2B non-residents in the 4th quarter of 2018, the dynamics of the number of registered foreign B2B companies engaged in service rendering tripled in the period from 01.01.2018 to 01.01.2019 (Fig. 2). This circumstance testifies to a greater degree to the expansion of the activities of non-residents in the Russian market of Internet commerce.
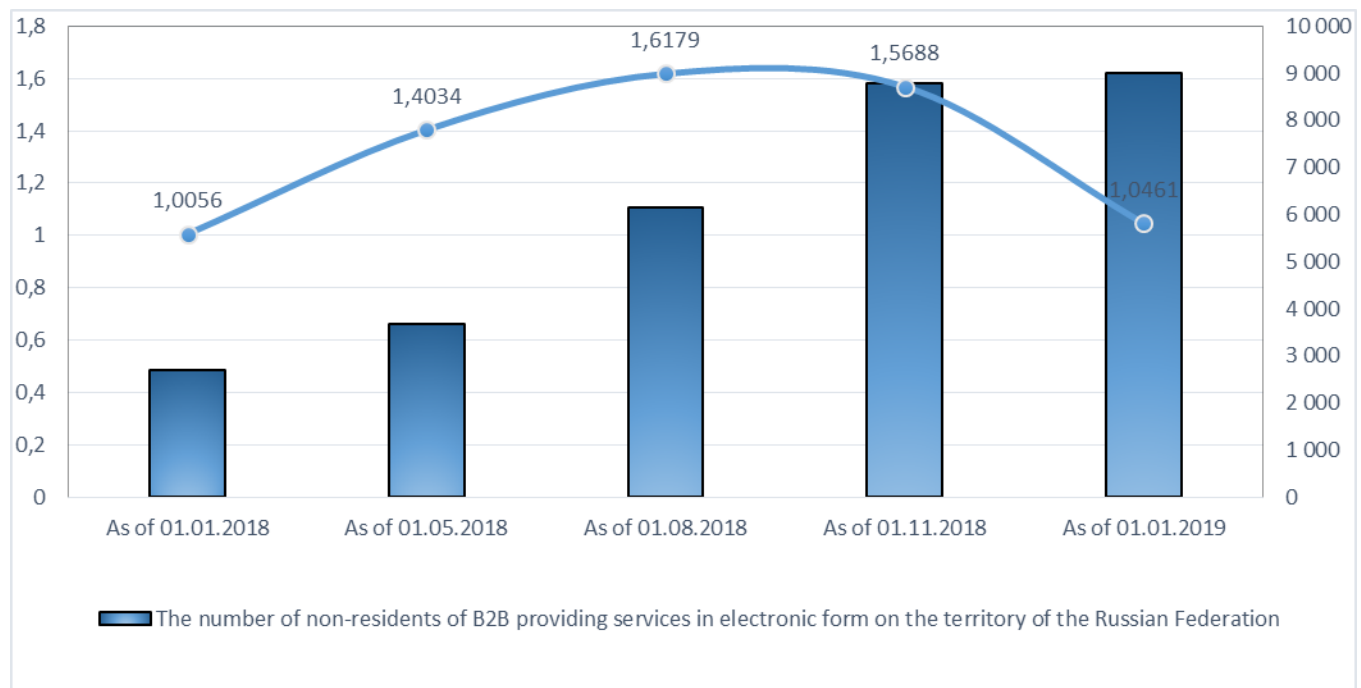
Fig. 2 The ratio of the growth rate of VAT payable to the budget of the Russian Federation and the number of existing foreign B2B companies
Source: https://analytic.nalog.ru/portal/index.en-GB.htm

Under these circumstances, one important aspect that may affect the decision-making of B2B participants should be noted. Indirect VAT is a tax on final consumption and it is paid at each stage of production and distribution, therefore, each manufacturer or distributor pays it when selling goods (works, services). At the same time, in the world practice of VAT implementation and payment, this tax does not distort the production process and does not affect the company's choice of its legal form. The current principle of VAT neutrality implies that every entrepreneur is entitled to receive a tax deduction for the purchase of goods (works, services) regardless of the type and specificity of the object of taxation, as well as the source of financing and the legal form of relations. Thus, one and the same entity must receive an identical right to VAT deduction. At the same time, according to the Russian tax legislation, foreign B2B companies, selling electronic content in the Russian Federation, have no right to apply a VAT tax deduction. When calculating the tax base for a calendar quarter, such organizations pay tax at the estimated rate of 16.67% (15.25% to 2019).

In turn, Russian B2B companies are entitled to tax deduction, therefore, they reduce the tax base by the amount of the tax deduction by paying VAT at a basic rate of 20% (18% to 2019).

The study showed that the introduction of the obligation to pay VAT, as well as the mandatory registration of non-residents with the Federal Tax Service did not provoke foreign companies to move to the e-commerce marketplaces in other jurisdictions, however, the sales volumes both from residents and non-residents decreased. In our opinion, this testifies to the intentions of the companies to expand their business capabilities and strengthen their competitiveness by participation in digital marketplaces of the countries with developing market economies, while the market itself is assessed as promising.

However, business shows enough caution in participating in B2B sales in emerging market jurisdictions. So, the largest B2B player "Mail.ru Group Limited", notes the following in its IASB reporting. Russian tax, currency and customs legislation is subject to varying interpretations, and changes, which can occur frequently. Management's interpretation of such legislation as applied to the transactions and activity of the Group may be challenged by the relevant regional and federal authorities. Recent events within the Russian Federation suggest that the tax authorities are taking a more assertive position in their interpretation of the legislation and assessments and as a result, it is possible that transactions and activities that have not been challenged in the past may be challenged. As such, significant additional taxes, penalties and interest may be assessed. Fiscal periods remain open to review by the authorities in respect of taxes for three calendar years preceding the year of review. Under certain circumstances, reviews may cover longer periods. The Group's management believes that its interpretation of the relevant legislation is appropriate and is in accordance with the current industry practice and that the Group's tax, currency and customs positions will be sustained. However, the interpretations of the relevant authorities could differ and the effect of additional taxes, fines and penalties on these consolidated financial statements, if the authorities were successful in enforcing their different interpretations, could be significant. At the same time, Mail.ru Group Limited does not disclose the information on the B2B sector either in IFRS or in other types of corporate reporting.

At the same time, another major participant, RUSNANO JSC, which conducts competitive procurement procedures in electronic form through the functionality of the B2B-Rusnano electronic marketplace, which is part of the B2B-Center unified electronic trading platform system, notes the following. The Group operates primarily in the Russian Federation. Accordingly, the Group's business is influenced by the economy and financial markets of the Russian Federation, which are characterized by the features of an emerging market. Legal, tax and regulatory systems are evolving, however, there is a risk of ambiguity in the interpretation of their requirements, which are also subject to frequent changes, which together with other legal and fiscal factors creates additional difficulties for the business of enterprises. At the same time, RUSNANO JSC does not disclose the information on B2B in its IFRS financial statements. However, in the annual report of the joint-stock company, it notes that the

purchases carried out using B2B marketplace account for 94.8% of the total volume of all contracts concluded. However, according to the results of competitive procurement procedures, they account to 5.2% of the total volume of all concluded agreements.

It should be noted that the number of foreign Internet companies registered in the Russian Federation as VAT taxpayers in the provision of B2B electronic services as of August 1, 2019 was 1784 companies, 55% of the total number of companies were sampled by the authors using the "random selection method" in relation to the data presented in the IFRS statements, US GAAP reporting. In general, the identity of professional judgment regarding the economic environment in emerging economies and the presence of significant tax risks associated with changing tax laws and the interpretation of tax laws by the regulatory authorities is common. It should be noted that the information contained in the audit report accompanying the IFRS reporting is a significant argument in the analysis of the situation. Thus, in the format of audit reports proposed by the Public Companies Accounting Supervisory Board (PCAOB) and approved by the US Securities Commission (SEC), the concept of "critical audit matters" i.e. the issues relevant to financial reporting, which can be complex and ambiguous, is used, the solution of which reaches the level of professional judgment. One of the critical audit issues identified in the audit reports is the issue of tax risks. Thus, the information on tax risks that reaches the level of professional judgment to a greater extent represents the risk of litigation in tax disputes, regular tax audits, many tax jurisdictions etc. At the same time, audit companies set a sufficiently low materiality threshold, which, as a rule, is 1% of the revenue. In particular, for a B2b participant, Vodafone Group it amounts to 215 million euros, while the reserve for expected legal tax risks amounts to 2000 million US dollars. Danfoss group of companies, with a significant revenue threshold of 392 million euros and the risk of tax litigations noted in the audit report, does not disclose the necessary information in absolute value in the financial statements. Consequently, the IFRS reports of the companies give only a truncated view of the performance of the company, which is mainly focused on compliance with regulatory requirements. At the same time, the procedure for information disclosure on tax risks associated with B2B is not covered. Basically, the companies are limited to standard wording on the ambiguity of tax systems in some jurisdictions and management's confidence in its correct interpretation. At the same time, the users of the reporting can estimate the magnitude of the threat only through information on the creation of reserves for tax risks and take into account critical audit issues in the audit report. At the same time, some information about the participation of the companies in B2B marketplaces and unsystematic data on some financial indicators can be found in other reports of the companies published on the Group's corporate portal or information disclosure server. In relation to the majority of B2B participating companies, the relevant information is not provided in either financial or other types of reports submitted in the public domain. In this regard, the problem of access to B2B information for the stakeholders, their information needs and the place of such information in corporate reporting, including a specific segment of the economy, remains unsolved.

5. Results

According to the results of the study and calculations, it can be confirmed that interest in digital marketplaces does not decrease among all B2B participants. However, the unfavorable economic situation, as well as a decrease in the purchasing power of the end users, may constrain the growth. In confirmation of the findings, the authors would like to cite expert assessments of the consulting company Frost & Sullivan. It is forecasted that B2B e-commerce market will be doubled, 6.7 trillion USD by 2020 year, and 85% of transactions between suppliers and customers will be carried out without personal participation (Dorofeyev et al., 2018). At the same time, the B2B e-commerce industry is a global phenomenon, in 2018, compared with 2017, in almost all countries there was a significant increase of no less than 7% based on the use of several business models: distributors (growth by 6.2 %), manufacturers (7%), retailers (26.6%), wholesalers (5.4%). Figure 3 shows the comparative data on B2B e-commerce sales to GDP as of 2017.
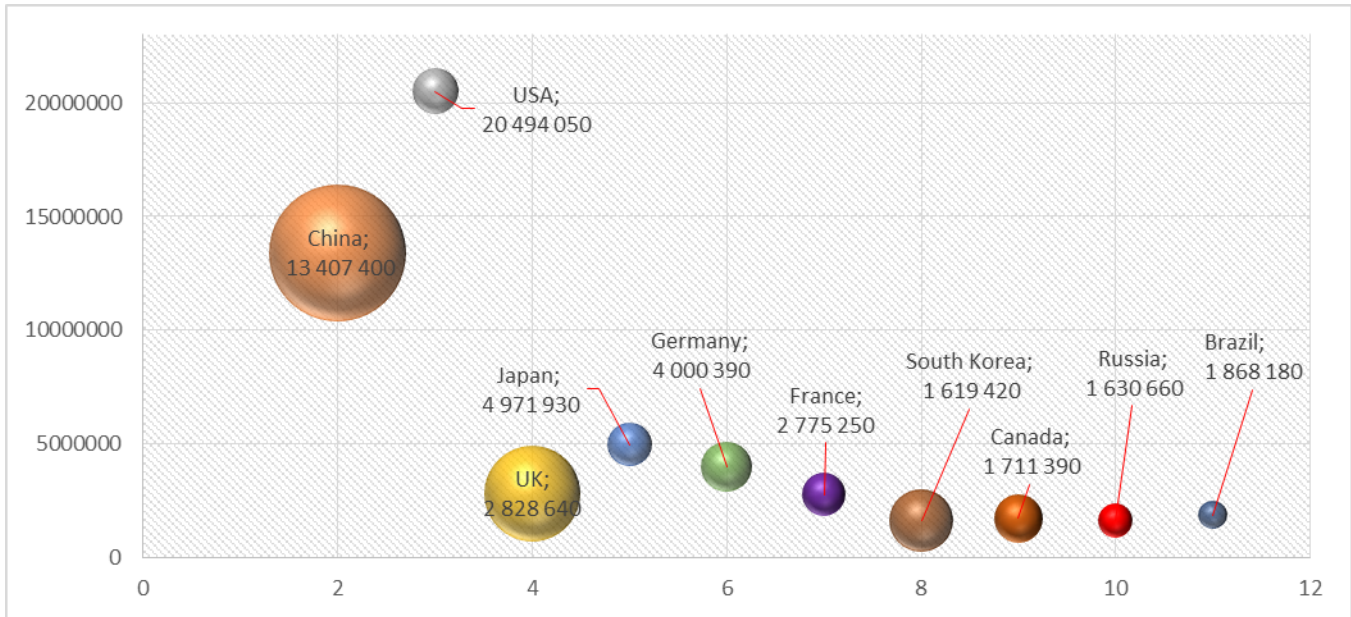
Fig. 3 Comparative characteristics of sales volumes for the most leading B2B e-commerce countries to GDP in 2017.
Source: https://www.forbes.ru/biznes/pmef-2018361073

Due to a possible change in tax rules for non-residents of B2B in order not to distort competition and stimulate Russian B2B market participants, aimed at quality improvement of products (goods, services) provided to the consumers, the state should create more attractive conditions. One of the tax incentives aimed at the attraction of foreign participants to B2B electronic trading platforms is to establish a lowering coefficient to the current VAT rate for the non-residents offering goods and services. Let us calculate the VAT for the abstract type of electronic services offered for sale by a foreign non-resident and a resident B2B participant, assuming that their VAT tax base is equal. Naturally, within the framework of competition and marketing strategy, companies can both increase and lower it. However, we will proceed from this condition, since the proposed service is assumed to be identical in its consumer characteristics. In this case, B2B non-resident, selling a certain product or service, must pay VAT to the budget according to the following formula:

$$VATb2b = \sum TB \times (16{,}67/100) \qquad (2)$$

where $VATb2b$ – VAT payable per calendar quarter;

$\sum TB$ – tax base for services rendered for a calendar quarter;

16.67 – current VAT rate for B2B non-residents.

In turn, a resident – B2B participant, selling a similar service, is obliged to pay tax to the budget according to the following formula:

$$VATb2b = \sum TB \times (20/120) \times (1 - r) \qquad (3)$$

where r – amount of own profit (or margin)

20/120 – current VAT rate, taken into account in the price of the service rendered.

Thus, B2B non-resident is in unequal conditions compared to a resident, and the difference in the calculated VAT value will be at least $(20/120) \times \sum TB \times r$. Since VAT refers to indirect taxes, it is paid by the end consumer. In fact, after the introduction of new VAT rules, for example, in Russia, Google LLC shifted the burden of tax payment to end customers, thereby increasing the price of the electronic product (Kevorkova, 2019). In turn,

Apple Inc. shifted the VAT payment to the developers of iTunes Store software applications (Kolesnichenko, 2018). This affected the reduction in the profit of intermediaries, while the software prices remained unchanged for the end users. At the same time, the ambiguity of tax legislation in various jurisdictions, cross-border transactions on digital platforms cause an increased risk in the field of taxation, including indirect B2B taxes. This necessitates the development of a strategy for the tax function of all parties to a transaction to level out a conflict of interest. In addition to the internal strategy, it is also required to develop an external strategy to inform all transaction participants and potential interested parties. First of all, this is associated with the good will risks, which may be the result of incorrectly interpreted information about the company in the media and on the Internet. Consequently, the need for wider disclosure of the information in corporate reporting and participation in the implementation of global initiatives to ensure tax transparency in the B2B segment is increasing.

6. Discussion

The identification and development of measures to prevent tax risks are necessary to ensure the successful financial-economic activities of all companies. The justification and development of measures should be based on the specifics of the participation of companies on digital platforms and aimed at revealing the integrity of the object, identifying diverse relationships in it. The common risks are as follows:

- the risk of financial losses related to the interpretation of legislation by regulatory authorities and a taxpayer (Gugl, 2015);
- the risk of additional tax charges, imposing penalties, fines resulting from a dispute and refusal by the regulatory authorities of the reimbursement of value-added tax (full name);
- the risk of financial losses arising from office and field tax audits (Gennaioli, 2015);
- the risk of irrational actions of officials responsible for the control and management of tax obligations (Morkovina, 2018).

The authors consider it necessary to highlight the following specific risks for VAT associated with the participation on digital platforms. As a rule, when determining the object of VAT taxation, the place of sale would be the territory of the relevant jurisdiction when one of the following conditions is met:

a) the buyer's place of residence belongs to the jurisdiction in which the transaction was carried out;
b) the payment is made through a bank or an electronic money operator located in the jurisdiction in which the transaction was carried out;
c) the buyer's network address is registered in the jurisdiction in which the transaction was carried out;
d) the international country code of the phone number used to purchase or pay for services is assigned by the jurisdiction in which the transaction was carried out;

However, it is rather difficult to technically determine the actual place of sale of goods, especially for small online stores, in the system of which there are no necessary resources:

a) not all online stores require to enter passport data or an actual phone number at the time of placing the order;
b) the payment can be made by alternative online currency;
c) the buyer's network address does not give an unambiguous answer to its location, since it does not exclude the possibility of using a proxy server that allows the signal to pass through an alternative country.

In this case, the guideline for assessing real sales volumes in the B2B, B2C e-commerce market for tax administrations in determining the tax base is only the submitted VAT tax returns. However, a fiscal surveillance mechanism in relation to non-residents, for example, during field tax audits, is not defined in tax legislation (Hyman, 2015). The current tax administration comes down to an analysis of the information submitted by B2B participants in tax returns, and they are not always correct.

In the context of these conditions, the authors do not set the task of developing a tax risk management system, since this is a separate study. But they think that the general algorithm of actions of the company's tax services should carry out at least the following actions:

a)	analyze of the types of the company's activities to determine the transactions that will or may be recognized as electronic services and, as a result, will lead to the need to register (if required by the laws of the jurisdiction) as a VAT payer;

b)	analyze the possibilities of obtaining the exemption from VAT on certain transactions that are not subject to VAT or taxed at a zero rate or are exempt from payment in the relevant jurisdiction;

c)	if necessary, revise the company's current business model, including the financial model, workflow to reduce tax risks for VAT on the digital marketplace;

d)	consider the possibility of selecting and setting up an ERP system for the necessary accumulation and processing of information on transactions on electronic platforms, which may be useful for assessing tax risks, making managerial decisions and auditing.

Due to the increased participation of companies in the new digital environment, there is an urgent need to carry out all necessary actions to optimize taxation and prevent tax risks. In the authors' opinion, the local scheme for mitigating VAT tax risks on the digital marketplace can be presented in the following format (Fig. 4).
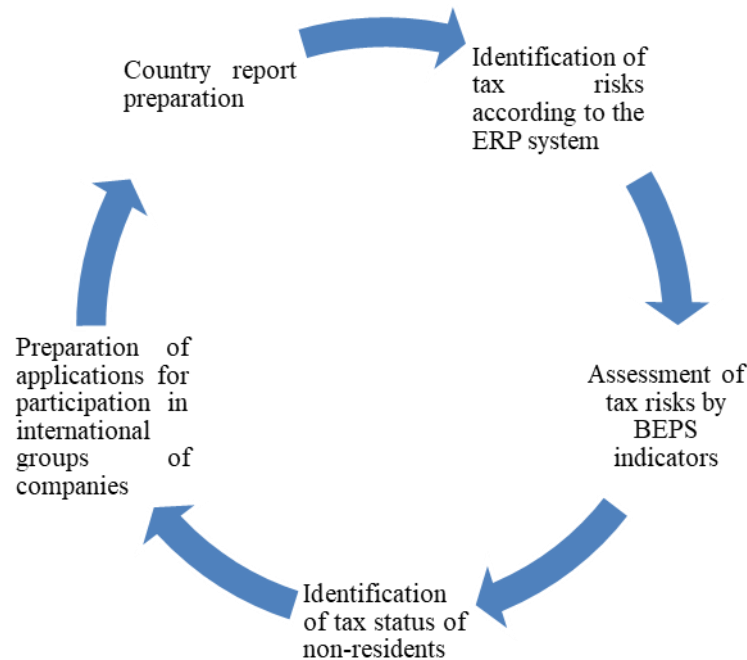
Fig. 4 Model for determining targets for mitigating VAT risks on transactions on B2B digital platforms.
Source: Suggested by the authors of the article based on the results of the study.

In the authors' opinion, the proposed model for mitigating VAT tax risks on the digital marketplace is universal for all business management systems and ERP systems used.

7. Conclusion

Based on the results of the study, it can be concluded that the electronic marketplace can be considered as a convenient and affordable service for all types of business. Emerging-market countries are characterized by the continuity of market mechanisms used in international practice to achieve a unity of approaches to solving intercountry economic relations. The introduction of VAT in the territory of post-Soviet countries and Southeast Asia is no exception. The choice in favor of VAT, and not another indirect tax, was made, since VAT allows creating a system, which is compatible with European countries. Regarding the digital marketplace, companies get the opportunity to sell goods to end customers on B2C or C2C models, as well as to conclude large-scale and small-scale wholesale transactions on B2B and B2B2C models. At the same time, historically, in the EU countries, the USA and emerging-market countries, different taxation systems have developed in relation to both direct and indirect taxes. The development of society digitalization, the provision of optimal tax treatment on the electronic marketplace can lead to a shift of business to transactions in a specific tax jurisdiction.

In international practice, the experience of introducing VAT for transactions on the B2B marketplace where transactions have not been previously subject to VAT is of interest, provided that the tax and regulatory system of the jurisdiction under study is assessed as a system with increased business risks. The above calculations showed that a B2B non-resident is in unequal conditions compared to a resident, and the difference in the calculated VAT rates is significant. But, at the same time, the obligation to pay VAT did not provoke the decision of foreign companies to move to the e-commerce marketplace in other jurisdictions, however, sales volumes decreased both on the part of residents and non-residents. In the authors' opinion, this testifies to the intentions of companies to expand their business capabilities and strengthen its competitiveness by participating in the digital marketplace of emerging-market economies, and the market itself is assessed as promising. However, the risk zones identified during the study predetermined that there is an urgent need to perform all necessary actions to optimize taxation and prevent tax risks on B2B. This necessitates the development of a strategy for fiscal functions of all parties to a transaction to level out a conflict of interest. In this regard, a practical solution is the introduction of a model of determining targets for mitigating VAT risks on transactions on B2B digital platforms. In the authors' opinion, transnational companies, as well as companies carrying out transactions with a complex structure of interaction between businesses from different jurisdictions, start-up business at the B2B marketplace, these recommendations will allow tracking factors that must be taken into account for the impact of VAT on the transaction price. In the authors' opinion, the proposed model for mitigating VAT tax risks on the digital marketplace is universal for all business management systems and ERP systems used.

Undoubtedly, in addition to the developed internal tax strategy, it is also necessary to develop an external one – relating to informing transaction participants and potential interested parties. First of all, this is associated with reputation risks, which may be the result of incorrectly interpreted data about a company in the media, the Internet. In turn, this increases the need for wider disclosure of information in corporate reporting and participation in the implementation of global initiatives to ensure taxation transparency. Based on the results of the study, it was determined that the disclosure of information on B2B transactions, indirect taxes and tax risks in corporate reporting is not imputed by regulators, is inconsistent, unstructured. In the authors' opinion, proactive information disclosure in corporate public B2B reporting is possible only if the company considers the information requests of users significant, and the cost of preparing such information does not exceed the expected effects.

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SELECTION OF STRATEGIC PRIORITIES FOR SUSTAINABLE DEVELOPMENT OF TOURISM IN A MOUNTAIN REGION: CONCENTRATION OF TOURIST INFRASTRUCTURE OR NATURE-ORIENTED TOURISM

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Abstract. The paper discusses options for tourist development of the Altai-Sayan region. For this purpose, a comparison is made between the current state of tourism and sustainable development of tourism. This makes it possible to propose five stages for the strategy of sustainable tourism development in the Altai-Sayan mountain region. The preservation of biodiversity and ethnic characteristics of the territory underlie the ethnoecological type of tourism, being the most consistent with the principles of sustainable development and promising in the studied mountain region. Functional zoning is considered as an important method for balancing and optimizing environmental management. It is proposed to use the landscape-adaptive principle as a basis for spatial planning of tourist service in the mountainous region. The spatial elements of the tourist network of the mountain region were analyzed. This made it possible to reveal the predominance of the linear structure in connection with the mountain-valley relief. There are also examples of radiation, dispersion, focal and linear-perpendicular structures of tourist networks. This allowed highlighting the priorities of tourist development for different territories. Functional zoning of the Altai-Sayan region with the identification of priorities in the development of the territory was proposed. This allowed identifying the spatial distribution of areas of intensive tourist use and areas of nature preservation and ecotourism. In addition, zones of weak economic development were identified with a predominance of tourist routes, as well as those of medium economic development with local tourist centers.

Keywords: sustainable development of tourism; functional zoning mountain region; tourism; the Altai-Sayan Mountains

JEL Classifications: Z32, L83, Q01

Additional disciplines ecology and environment; geography

1. Introduction

Tourism makes a significant contribution to the sustainable development of regions. However, positive economic impacts are only part of what tourism brings. It is also able to change the basis of the natural tourist attractiveness and take away the identity from the inhabitants of the mountains (Messerli, 1999).

It is now recognized that the uncontrolled growth of the tourism industry, which aims to achieve quick profits, often has negative consequences, because it causes damage to the environment and the population, destroying the resource basis of tourism (Sharpley, 2009; Miller et al., 2005).

The UN WTO identifies a number of reasons why national and regional tourism planning needs to be carried out. They are related to the fact that, on the one hand, tourism contributes to economic development, socio-cultural reproduction, environmental preservation, and on the other hand, a significant list of aspects of the negative impact of tourism can be identified. In the absence of a long-term science-based concept of tourism development, the negative consequences are more pronounced: excessive consumption of resources, environmental pollution; esthetic pollution, changes in the habitual way of life and traditions; conflicts of tourists and local residents; the increase in crime, price growth, seasonality, economic dependence on tourism and much more (World Tourism Organization, 2004).

Sustainable development of tourism ensures the unity of the three components: development of tourism in conjunction with the main environmental processes; economic sustainability is achieved by the role of tourism as one of the ways to develop the local economy through balanced resource management; socio-cultural sustainability allows increasing employment and incomes of the population, preserve historical and cultural monuments, strengthen local identity and the established way of life (Gulyaev, Selivanov, 2008; Orynbassarova et al., 2019).

The concept of sustainable tourism development is generally recognized in leading countries of the world and in a number of international organizations, including the World Travel and Tourism Council (WTTC), the International Federation of Tour Operators (IFTO) and others.

Taking the Altai-Sayan mountain region as a case study, the authors propose to consider the choice of priorities for the tourist development of territories. For this, it is necessary to work out successive stages in the formulation of a strategy for the tourist development of territories. First of all, it is necessary to analyze the prerequisites for the development of tourism. Then, existing tourism may be assessed for compliance with the principles of sustainable development. Further, using the methods of spatial analysis and modeling, one can reveal a variety of tourist priorities depending on the territory (Goryushkina et al., 2018; Bozhkova et al., 2019; Akhmetshin, 2017; Shevyakova et al., 2019; Titova et al., 2019). However, only a comprehensive analysis of tourism in the mountainous region will make it possible to identify strategic priorities for different territories (Dunets et al., 2019; Sharafutdinov et al., 2018; Korableva et al., 2019a; Voronkova et al., 2019).

The aim of this study is to identify some priorities for the spatial development of tourism and to identify which areas can be stable, taking into account the high concentration of tourist infrastructure and, on the contrary, to reveal where natural tourism is promising.

The Altai-Sayan region due to its location in the center of Eurasia in different eras united various ethnic groups and cultures. The region has some prerequisites for the formation of single tourist space. These include the natural and ethnocultural similarity of the territory, the need for joint protection of the natural heritage, the proximity to the markets of neighboring countries, the economic benefits of trade and economic cooperation, the organization of cross-border tourism, the search for sustainable development of border areas, etc. (Plyusnin, et al. 2002).

2. Methods

Since the end of the 20th century, in many academic papers, the development of the territorial structure of tourist destinations has been examined from the perspective of the sustainable development concept. This paradigm has identified changes in the research of tourist activities. Sustainable regional development is aimed at reaching a compromise between global, national and regional development priorities. The key concepts of sustainable development are the equality of relations, equilibrium, balance, and consistency (Kotlyakov et al., 1997). Drozdov (1998) notes the development of trends in ecologization and sociologization of research in the field of tourism. Yakovenko (2003) considers the optimization direction of most developments, i.e., the geographical justification for making management decisions to rationalize environmental management, as a characteristic phenomenon in the study of tourism. Under the optimization, he understands the choice of the most effective ways of development of tourist systems, in order to increase the economic effect and reduce the negative environmental consequences (Ghosh and Ghosal, 2019; Sycheva et al., 2019; Mandal and Sanyal, 2019; Ige, 2019; Lafer and Tarman, 2016, 2019; Neizvestnaya et al., 2018).

For sustainable development, the method of functional zoning is used. This is a division of the territory into zones, with the aim of ensuring the maximum compliance with the use of tourist resources with the needs of tourists and preserving the attractiveness of the territory (Rodoman, 1999). As the main tool of strategic management, functional zoning of the territory is declared with the allocation of corridors and development zones and preferred specializations. Through the tools of public-private partnerships and subsidies, it is proposed to use the regulation of territorial priorities of business development (Baburin and Goryachko 2009).

Tourism development planning is defined as one of the management functions consisting in developing plans to identify the future state of tourist destinations, as well as methods and means of achieving it in the context of resource constraints.

In planning documents, authorities and designers often consider tourism in general and ignore the opinions of local residents, who are the main author of recreational activities and the condition for the functioning of tourism. Also, short-term tourism and recreation are usually excluded from the plans of local authorities, due to the complexity of their planning (Veal, 2002).

Hall notes that a sustainable tourism approach can be combined with an economic spatial one; locally oriented; standardized; modeling (Hall, 2008).

3. Results

A tourism development strategy can be adaptive in nature, when tourism activities tend to organically blend in with the natural and socio-cultural environment, and constructive, when the natural environment is actively transformed to more closely match tourism needs (Yakovenko, 2003; Korableva et al., 2019b; Kuznetsova et al., 2019; Kilinc et al., 2018).

Many mountain valleys of the Altai-Sayan region became accessible due to the growth of tourist needs. Tourism provided local people with additional income and employment, opened up new career opportunities, and created markets for traditional agricultural products.

The traditional development of tourism contributes to the emergence of a number of problems related to an increase in land value, seasonal employment and lower positions for local employees, intensive use of resources, water pollution, increased waste and loss of agricultural land, small financial flows for the host party, collision of material and spiritual interests.

Comparison of regional programs for the development of tourism, the actions of the authorities of the administrative regions of the Altai-Sayan region and the recommendations of the UN WTO allowed a comparison of the traditional and sustainable development of tourism (table 1).

Table 1. Comparing the current state and sustainable development of tourism

Comparison points	Current tourism state	Sustainable tourism development
Balance of economic, environmental, and social interests	Missing	Present
Economic, environmental and social risks	Present	Minimized, preventive measures
Development priorities	Scaling up and cost-effectiveness	Rational organization of tourist areas, meeting tourist needs, preserving the natural environment, the economic effect
Regional strategy for the development of tourist destinations	Priority to regional development goals	Interrelation of regional goals with national and international ones, differentiation of models of organizing tourist areas and types of tourism, taking into account regional features and their compatibility
Managing the development of tourist destinations	Episodicity and discretion of attention to the development of tourist destinations, multidirectional management actions	Continuity, preventive measures, integration, consideration of regional peculiarities in tourism policy

To justify and develop a strategy for sustainable tourism development in the Altai-Sayan region, the authors have identified five stages.

1. An analysis of the prerequisites for sustainable development of tourism in the mountainous region. For this purpose, the features of tourist activity, its dynamics and seasonality are studied. The main trends in the development of tourism and their interaction with the natural and social organization of the territory are identified. It is necessary to analyze tourism resources, study the political, socio-cultural, environmental and economic aspects of the impact of tourism in the region. An important component of the study of the prerequisites for the development of tourism is the identification of features of the tourism management system in the region.

2. Creating a system of indicators of sustainable tourism development, taking into account the peculiarities of the mountain region. Evaluation of the legal, economic development of tourist destinations, the interaction of tourism with the socio-cultural environment, the degree of transformation of the natural environment. Identification of the most urgent problems and their territorial differences.

3. Methodological substantiation of spatial development and development of models for the sustainable development of tourist destinations. Identification of regional models of tourist destinations. Cartographic, mathematical, simulation modeling of tourism development. Identification of target functions, parameters, restrictions, development of a geoinformation system of tourist destinations.
4. Development of strategic solutions for the sustainable development of regional tourist destinations. Forecasting the sustainable development of various types of tourist destinations in the context of options for the development of the situation in the region. Selection and justification of development priorities. The rationale for the balanced development of various types of tourist destinations and types of tourism. Development of recommendations for the prevention of conflict situations with economic entities of related industries and local residents, development of recommendations on a balanced relationship between the processes of operation and restoration of tourist resources. Justification of the mechanism of management of tourist destinations.
5. Implementation of management decisions in tourist destinations, their adjustment taking into account possible situations, indicative monitoring, and planning.

The organization of tourism should be implemented in the regions, taking into account the landscape-adaptive principle. This applies to the construction of buildings, the creation of tourist routes, the justification of permissible tourist loads, the allocation of protected areas, etc. The development of tourism in the mountains should be based on a comprehensive solution of issues related to the conservation of biodiversity.
In the Altai-Sayan region, a significant part belongs to special protected natural areas, where, with the observance of the requirements of environmental legislation, the formation of a special type of tourist zones is promising. The development of an adequate strategy for the development of a border mountain region is associated with the integration of territorial and socio-economic planning of the area.

For the rational organization of tourist destinations, it is important to take into account the regional peculiarities, tourist and geographical position. In the territorial strategy of tourism development, it is necessary to identify the diversity of perception of the places (tourist areas). It is necessary to take into account all possible characteristics of any place: history, nature preservation, favorable habitat for humans, biodiversity, cultural significance, landscape-aesthetic appeal, the value of resources, and systemic interrelations.

The development of tourism in the mountainous region is conditioned by the peculiarities of the relief, the climatic conditions, the uniqueness of landscapes, the importance of specific objects for local residents, the architecture of buildings and structures, including the use of materials and the skill of builders, historical and cultural heritage (Hall, Butler, 1995). The organization of tourism should be consistent with the natural features of the region, the traditions of the local population, opportunities and prospects for economic development (Gret-Regamey, Bishop, Bebi, 2007).

The development of tourism is a priority for many administrative areas of the Altai-Sayan region. However, the ideas about the most important types of tourism differ among administrative authorities. The main goal in the development of tourism in the regional administrations of the Russian part of Altai is associated with the intensive development of tourist activities in several zones, where there are some prerequisites for the creation of tourist clusters.

Nyamdavaa (2009) notes that the development of ethno-tourism is of great importance for Mongolia. The most important part of special protected natural areas can be protected border areas, which are necessary for the comprehensive protection of migratory species of ungulates and migratory birds, the joint study of their habitats and the development of cross-border tourism. For the first time, a protected border area was created with the participation of the Katun Reserve (Russia) and the Katon-Karagai National Park (Kazakhstan).

In the Altai District of China, the intensive development of tourism is associated with particular functional zones of protected natural areas. The main area of tourism development in the Chinese part of Altai is the Kanas National Park. It is divided into three functional zones: the main, the buffer and the scientific and experimental zones. The development of tourism is implemented mainly in the area of the Kanas Lake and in the southern scientific and experimental zone (Di, Yang, 2009).

Rural settlements dominate in the border areas of the Altai-Sayan region, where agrarian production plays a significant role in the economy. Traditional use of nature in most areas is advisable to be complemented with tourism. Taking into account the natural and socio-economic features, the development of rural tourism is promising, which can become an important type of additional economic activity of the local population.

In the authors' opinion, ethnoecological tourism, which has good prospects in the region, most fully corresponds to the principles of sustainable development. This type of tourism implies traveling to the areas with a slightly changed natural and cultural environment, to the places of traditional residence of certain ethnic groups with educational purposes (Dunets, Indyukova 2015). Based on its name, this type of tourism satisfies all three components of sustainable development (Fig. 1).

Social development is associated with the preservation of ethnic diversity, the support of the local population, the preservation of traditions, etc. Ecological development is caused by the need to preserve natural complexes, to develop the network of protected areas, etc. Economic development is determined by the understanding of tourism as a sphere of the economy, which has some prospects in the Altai-Sayan region.
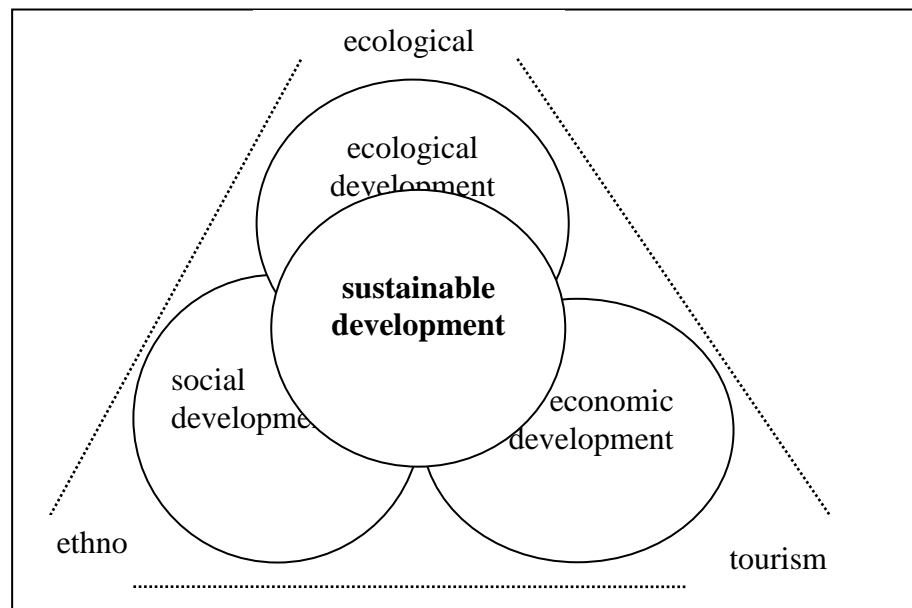
Fig.1. Title Interrelation of components of sustainable development and ethnoecological tourism

In order to identify the spatial features of tourism, the authors analyzed the tourist network of the Altai-Sayan region. The level of socio-economic development has a great influence on the tourist network of the Altai-Sayan region; state borders and large natural objects significantly influence it. In the Altai-Sayan region, interesting natural objects are concentrated in the border areas (mountains: Belukha, Tabyn-Bogdo-Ola, Mongun-Taiga, Munku-Sardyk; lakes: Hubsugul, Ubsu-Nur, etc.). Due to the cross-border situation, the tourist development of these objects has additional difficulties, and their visit is associated with the border and customs formalities

(Dunets, 2009). Many rivers are used to organize water routes and tourist paths pass along their banks. In the process of tourist development of the territory, a network of tourist routes is being developed. Tour centers in the region are connected by a linear-network structure.

The analysis showed that the most common type of tourist network in the conditions of the Altai-Sayan region is linear, which is formed on the basis of natural dominants; in intermountain basins, along the banks of large aquatic reservoirs, in river valleys, and also on the basis of transport communications (for example, the Katun River, the Irtysh River, the Yenisei River, the Chuisk Highway). The dominant natural "axes" – the rivers – clearly highlighted the priority functions of such zones, and the integrity of the territory ensures the continuity of traveling. The riverside landscape complexes during the historical period of development contributed to the concentration of settlements and numerous cultural monuments. The Altai-Sayan region is characterized by the presence of large intermountain basins where rivers flow or lakes are located.

Given the mountainous nature of the territory of the Altai-Sayan region, the linear-stripped structure of tourist networks is the most promising. Distant territories may have dispersed and focal structures. The ray structure is characteristic for the development of the valleys of the tributaries of large rivers. The linear-perpendicular structure of tourist networks is found in the places of development of the coast of lake and the river valley flowing out of it (development of the northern coast of Lake Teletskoye and the upper valley of the Biya River), and also when the valley of the river enters the plain area at the foot of the mountains, the perpendicular structure of tourism is formed. Examples of this are in the Russian part of the Pre-Altai Plain (resort of Belokurikha), the Tunkinskaya depression (resort of Arshan).

The most important tool for the strategic management of tourism in the spatial aspect is the functional zoning of the territory with the allocation of corridors and development zones of preferred specializations in the territory.
At the level of the Altai-Sayan region, it seems appropriate to identify functional areas with some priorities for tourist use. Creating a promising spatial structure of tourist networks can be implemented with due regard for the principles of sustainable development and adaptation of types of tourism organization to the territorial-situational environment. Such an approach will contribute to the improvement of socio-economic cooperation, the development of culture and the preservation of biodiversity in the Altai-Sayan region. The authors recommend creating spatial tourism options subject to the adaptation to socio-economic and high-altitude landscape conditions, their ecological state and modern features of tourist development. In Fig. 2, the authors propose the allocation of the main functional areas of the Altai-Sayan region, taking into account the priority of various types of tourism organization.

Regions have a different level of economic development. For example, the Krasnoyarsk Territory or Kemerovo Region have much more developed infrastructure and industrial development than the Republic of Altai. It is difficult to compare Mongolia and China between each other. In this regard, for each region, the authors have identified a weak, medium and high level of economic development. However, the low level in the Kemerovo Region will be high for Mongolia. This approach allowed showing on the map the different levels of economic development and the corresponding priorities of tourism in each territory. A cartographic analysis shows the location of protected suitable areas near state borders. These areas are also attractive for the development of ecotourism. In addition, the main tourist centers are highlighted, surrounded by the areas of intensive tourist development.
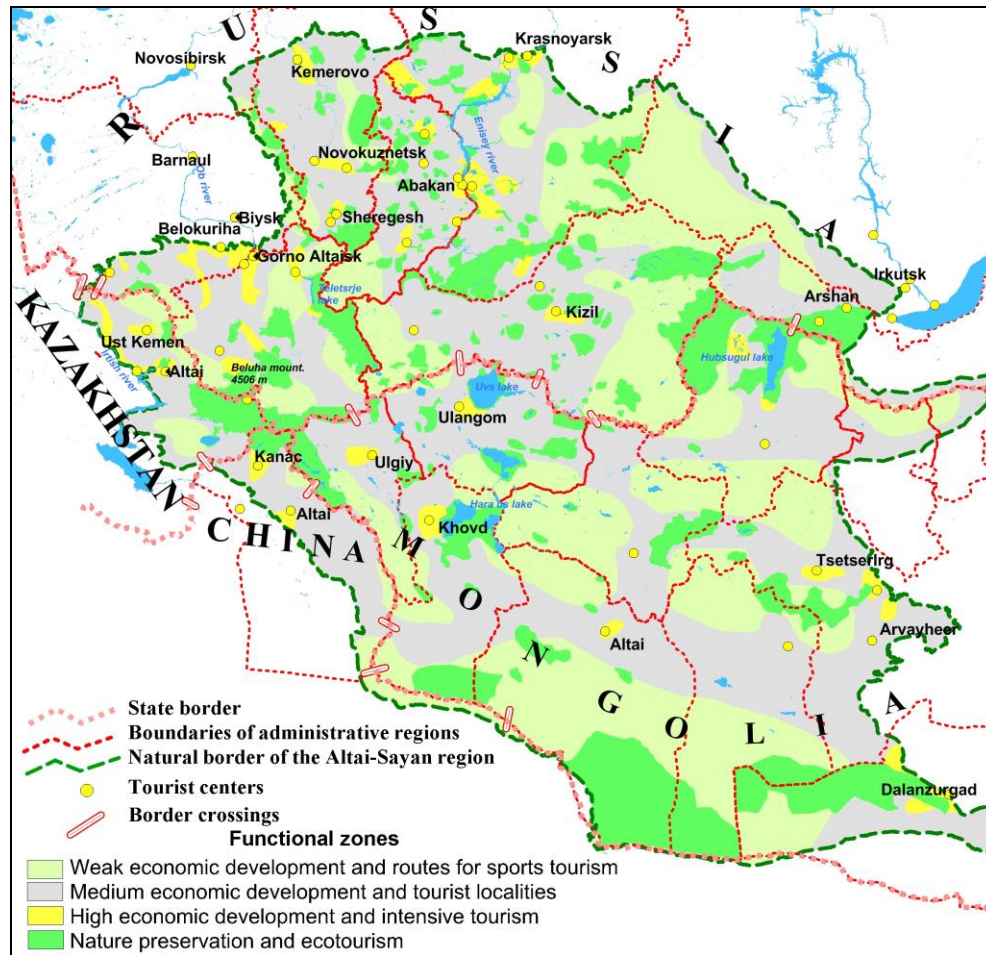
Fig. 2 Functional zoning of the Altai-Sayan region, taking into account the development prospects of tourist areas

4. Discussion

In all border areas of the Altai-Sayan region, special protected natural areas are located. The development of ecotourism is promising in those territories. Rural and ecological tourism should be priority types of tourism for most of the remote border areas of the Altai-Sayan region. Prospects for tourism development are determined by a combination of environmental activities with regulated agricultural production and preservation of ethnocultural identity.

The organization of tourism in the Altai-Sayan region provides for the search for rational use of protected areas in tourism, which constitute the natural heritage of the region. The mountainous region can become the largest center of international ecotourism, scientific research, cultural relations and rational use of resources. To this end, work is needed to expand interstate cooperation based on the principles of mutual benefit and strengthening security in the region. Transport and other infrastructure will play an important role in socio-economic development and rational use of resources (Hu, 2009).

Taking into account global trends in the formation of demand in global tourism, associated with increasing attractiveness of territories with a well-preserved ethnocultural environment, it is advisable for authorities and businesses to develop ecological, ethnic, health-improving and adventure types of tourism (Goloshchapova et al.,

2018; Trofimova et al., 2019; Polyakova et al., 2019; Plaskova et al., 2017). Only the accessible valleys of low-mountain areas are most suitable for active tourist development and mass tourism.

Border administrative areas need to conduct a coherent information policy, responsible marketing and coordinate the stakeholders of tourism activities to ensure the spatial and temporal balance of tourism.

Sustainable tourism development is a combination of processes characterized by spatial heterogeneity and controllability. Only with the help of conscious regulation, one can come closer to a balanced combination of compromises between objects and subjects of tourist activity.

The transition of mountain regions to sustainable development requires a revision of the directions in the state regulation of the tourism sector, the strengthening of its indirect components, seeking to create favorable conditions for the formation of tourist infrastructure, attracting investment, strengthening economic ties (Prodanova et al., 2019a, b). It is necessary to strengthen the measures of state support aimed at creating favorable conditions for organizations associated with the development of tourism in the border mountainous areas.

Conclusions

Every year, tourism is becoming an increasingly important source of income for residents of the Altai-Sayan region providing a rare opportunity for them to participate in the global economy. Natural and socio-cultural resources can provide an opportunity for significant tourist development. However, the growth of tourism does not necessarily lead to a stable development of the mountains, since the territory is significantly differentiated, which also applies to its development. Formulation and implementation of tourism development strategies should be based on a systematic understanding of tourism and its relationship with many elements in the mountain region.

Thus, the mountain region is characterized by a number of structural features. Therefore, the choice of zones of active development, where tourism can most effectively develop, is important for the development of the regional economy. For the sustainable development of tourism in the region, a regional territorial planning strategy for tourist activities should be identified to be implemented at the international level. Therefore, it was proposed to allocate different functional areas depending on the prospects for tourist development.

The mountainous region can become the largest center of international eco-tourism, scientific research, cultural relations and rational use of resources.

Tourism makes a significant contribution to the sustainable development of mountain regions. The development of tourist destinations in a cross-border region is associated with the implementation of specific projects on the basis of the principles of sustainable development and interstate cooperation. These projects primarily include ecotourism development in special protected natural areas, cross-border routes, tourist infrastructure. The integrated tourist development of border areas leads to an increase in interaction effects in the cultural, social, and economic spheres.

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STRATEGIC POLICIES FOR SMALL AND MEDIUM BUSINESSES IN MARKETING THROUGH E-COMMERCE[*]

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Abstract. Previous literature on the Theory of Planned Behavior suggests that attitudes, subjective norms and behavioral control have a significant effect on behavioural intention including the e-commerce marketing intention by small and medium businesses. More recent studies noted that behavioral control, spiritual intelligence, and intentions have a significant effect on behavior in marketing through e-commerce. In this study, a model developed by Darsono (2018) was further refined based on the results of the model trials carried out using data collected in Malang City, Indonesia. The objectives of this study are: (1) to determine the strategic policies of small and medium businesses in e-commerce marketing by using the Exponential Comparison Method (ECM), and (2) to analyze policy profiling for several types of e-commerce marketing by using correspondence analysis. The Exponential Comparison Method (ECM) is a data analysis techniques based on a decision support system that describes a complex multi-factor problem into a hierarchy where each level of the hierarchy is composed by several specific elements. By using the hierarchy, a complex and unstructured problem is broken down into groups which are then organized into a hierarchical form. Based on the results of ECM analysis, this study recommends the strategic policies of SMEs in the selection of e-commerce marketing related to attitudes towards e-commerce marketing, subjective norms, behavioral control, spiritual intelligence, and the intention to buy and sell online in the market with each attribute. The results of the correspondence analysis further explain the existence of special characteristics in each choice. In particular, (1) online buying and selling in the marketplace has been ranked as the first option based on two considerations, i.e., how to receive orders and shipping methods; (2) internet banking and SMS banking was ranked second based on place to sell products and payment methods; (3) cable TV and internet provider was chosen as the last option based on customer sevice; and finally (4) product considerations are noted in all options.

Keywords: strategic policy; marketing; e-commerce; small and medium businesses

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JEL Classifications: O32

Additional disciplines (besides field of economics reflected in JEL classifications): sociology; information and communication; mathematics

1. Introduction

The main focus in the Theory of Planned Behavior (TPB) is intentional behavior whereby intention is an intermediate variable that causes behavior. The literature suggests multiple views on the concept of intention. For instance, intentions has been are considered as (1) "catchers" or intermediaries for motivational factors that have an impact on a behavior; (2) intention shows how hard someone dares to try; (3) intention drives how much effort someone is planning to do; and (4) intention is closest to the next behavior (Ajzen, 1991). TPB suggests three determinants of conceptually independent intentions, namely: (1) attitudes toward behavior that indicate the degree to which a person has a good or poor evaluation of a particular behavior; (2) subjective norms as social factors that indicate perceived social pressure to do or not take action / behavior; (3) control of perceived behavioral control, shows the ease or difficulty of taking action and is considered as a reflection of past experience in addition to anticipated obstacles or obstacles (Ajzen, 1991).

More recently, additional variables have been integrated to the Theory of Planned Behavior (*see* Hage & Posner, 2015; Pekerti & Sendjaya, 2010; Sina & Noya, 2012). From e-commerce perspective, a study by Darsono (2018) suggests that spiritual intelligence plays a significant role in modeling for e-commerce marketing among the small and medium businesses. The findings of the study found that (1) attitudes, subjective norms, behavioral control, and spiritual intelligence have a significant effect on intention in e-commerce marketing by SMEs (2) behavioral control, spiritual intelligence, and intention have a significant effect on behavior in e-commerce marketing by SMEs; (3) behavioral control, and spiritual intelligence have a significant effect on behavior and intention as mediators in e-commerce marketing by SMEs. Nevertheless, a further examination of the strategic choices of policy formulation regarding e-commerce marketing among the small and medium businesses are still lacking. As such, a more systematic approach in solving e-commerce marketing strategic options need to be addressed.

The literature suggests that the Exponential Comparison Method (ECM) can be used to to solve strategic policy problems (Yulianti & Juwita, 2016). ECM is a decision support system that describes a complex multi-factor problem into a hierarchy where each level of the hierarchy is composed by several specific elements. With hierarchy, a complex and unstructured problem is broken down into groups and then the groups are organized into a hierarchical form. In this study, the process of selecting alternative solutions using the Exponential Comparison Method (ECM) enables several strategic steps in an effort to increase team collaboration on work efficiency in small and medium enterprises to be identified.

Thus, the present study aims to address the following research questions:
  a. How to determine the strategic policies of SMEs in e-commerce marketing by using the Exponential Comparison Method (ECM)?
  b. How is the policy profiling for several types of e-commerce marketing done using correspondence analysis?

Based on the above research issues, this research was conducted to solve strategic policy problems in e-commerce marketing by SMEs with particlar reference to the application of the Theory of Planned Behavior in a model developed by Darsono (2018). More specifically, the objectives of this study are as follows:

a. To determine the strategic policies of SMEs in e-commerce marketing using the Exponential Comparison Method (ECM).
b. To analyze policy profiling for several types of e-commerce marketing using correspondence analysis.

In this study, the results of the modeling are carried out through an in-depth study by looking at the suitability between the causes and solutions, the weaknesses and strengths of each alternative solution carefully and deeply identified for further verification. Various opinions and ideas are gathered from key respondents, both in the government and industry, pertaining to this research issues. Selection of various alternatives is used to choose the best solution. Alternative solutions are arranged in priority and simulated to obtain maximum results.

2. Literature Review

2.1 Theory of Planned Behavior

In general, it can be said that the better the attitudes and subjective norms of a buying behavior, and the greater the behavioral control it feels, the stronger the consumer's intention to carry out the intended purchase. Conversely, intention, is seen as a decisive variable for real behavior, meaning that the stronger the intention of the consumer to make a purchase or to reach the purchase goal, the greater the success of behavioral predictions or behavioral goals to occur. However, the success rate will depend not only on intention, but also on non-motivational factors such as opportunities and resources (for example: time, money, skills, cooperation from others, etc.). This can be studied further by basing on Ajzen's (1985) observations. Together these factors show a person's real control of behavior. In the event that a person has the opportunities and resources needed, and tends to carry out the behavior, in that condition he can succeed. The behavior in question must be specific, not general behavior.

Behavioral control problems can only occur within the boundaries of certain actions, and other actions occur because of the influence of factors outside one's control. Simple behaviors such as driving to a supermarket can be hampered by vehicle engine problems. So, control of behavior can be viewed as a continuum. One extreme is behavior that has little contradiction if there is a problem of control. For example is a choice at a hair salon. After consumers enter the salon, the choice of the haircutter (people are certain) can be done at will.

Measurements in the Theory of planned behavior are attitudes, subjective norms, and behavioral controls that are felt. These three components interact and become a determinant of intention / intention which in turn will determine whether the behavior in question will be done or not. Attitudes towards a behavior are influenced by the belief that the behavior will bring desired or undesirable results. Normative sticky beliefs (expected by others) and the motivation to act in accordance with normative expectations forms subjective norms in the individual. Perceived behavioral control is determined by past experience and individual estimates of how difficult or easy it is to conduct behavior. This behavioral control is very important when a person's confidence is in a weak condition. The relationship of the three components in the theory of planned behavior can be explained as follows: behavior is influenced by intention to behave, while intention is influenced by variables: attitudes, subjective norms, and behavioral controls.

Zohar and Marshall (2002) explain spiritual intelligence as intelligence to deal with and solve problems of meaning and value, namely intelligence to place our behavior in a broader and richer sense, intelligence to judge that an action or way of life will be more meaningful than others. Zohar and Marshall (2002) also provide different meanings about spirituality and religiosity, that spirituality is not related to religiosity. Religiosity is related to religion (religion) which is the basics of life that make individual life become organized, while spirituality is an individual effort to reach a certain mental level where in these conditions humans try hard to unite with their God, unite with the universe and merge with surrounding energy.

The capacity of spiritual intelligence that develops in humans according to Zohar and Marshall (2002) can be seen from observations, among others, as follows: (1) ability to be flexible, (2) high level of awareness, (3) ability to deal with and exploit suffering, (4) ability to deal with and transcend pain, (5) quality of life inspired by vision and supply-value, (6) reluctance to cause unnecessary losses, (7) real tendency to ask "why" or "what if" to look for fundamental answers.

Pekerti and Sendjaya (2010) stated that spiritual intelligence shapes personal, moral character and behavior. Spiritual intelligence must be possessed by every individual including the leader. Leaders are individuals who have a strong influence in the organization to shape the performance of the people they lead. Spiritual intelligence affects the intention to behave (Hage & Posner, 2015). Spiritual intelligence is a form of intelligence that is used to achieve success in work and life. Someone who has high spiritual intelligence will influence behavior in every decision making (Sina & Noya, 2012).

2.2 E-Commerce Marketing of Small and Medium Businesses

Marketing is a social and managerial process in which individuals and groups get what they need and want by creating, offering, and exchanging valuable products with other parties. According to Kotler (2003) marketing is a social and managerial process where individuals and groups get their needs and desires by creating, offering and exchanging something of value to each other. This definition is based on core concepts: needs, desires, and demands, product values, values and satisfaction, exchanges, transactions and relationships, markets and marketing and marketers. Whereas according to Assauri (2011) marketing is a human activity that is directed at fulfilling and satisfying needs and desires through an exchange process.

Electronic Commerce (electronic commerce) is part of electronic business (business conducted by using electronic transmission). The global definition of e-commerce is all forms of trade transactions of goods or services carried out electronically. A formal definition of e-commerce is provided by Baum, Locke and Smith (2001), namely: a dynamic set of technologies, applications and business processes that connect companies, consumers, and communities through electronic transactions and trade in goods, services and information carried out electronically. The quality of internet marketing and differentiating qualitative criteria for the development of internet marketing will help in the internet process of implementing marketing quality.

The development of this media is the most rapid compared to other media in supporting e-commerce. There are two supporting factors that cause the internet to develop faster in mediating e-commerce, namely (1) the internet has a very wide range, is cheap, fast, and easily accessible to the public; (2) the internet uses electronic data as a medium for delivering messages / data so that information can be sent and received easily and concisely, both in the form of analog and digital electronic data (Teo, Raganathan & Dhaliwal, 2006). According to (Teo et al., 2006) traditional trade is basically the actions of companies selling goods and / or services to generate income in the form of money, which in turn produces net income from the difference in income minus market prices plus operational costs.

Electronic commerce does things similar to traditional trade, but having advantages directly can be useful to increase company revenue and profits. With the flexibility of electronic commerce can reduce marketing costs with ease and sophistication in delivering information about goods and services directly to consumers wherever they are. Companies that do business electronically can also cut shop operating costs because they do not need to display their items in large-sized stores with many employees. Commitment to products or services, enthusiasm to compete, enthusiasm for entrepreneurship and enthusiasm for opportunities correlate with business tenacity. Entrepreneurs who have enthusiasm for entrepreneurship continue to stay in business.

Small and medium enterprises (SMEs) have a very large role in the national economy. The functions and roles of SMEs include: providing goods and services, absorbing labor, equitable income, adding value to regional

products, improving living standards. The absorption of SMEs towards labor is very large and close to the small people (Supardi, 2009; Kowo et al., 2019). The main problem faced by SMEs is marketing (Supardi, 2009). Marketing with conventional methods requires high costs, for example opening new branches, participating in exhibitions, making and distributing brochures etc.) The development of the internet has become an efficient means of opening new marketing channels for products In addition to the relatively low cost of SMEs, using the internet to disseminate information will be faster and broader in scope, development of e-commerce marketing and sales models to overcome these problems (Supardi, 2009). The growth and sustainability of the company are subject to the adoption of technology-oriented business processes led by information systems within the organization.

To improve the competitiveness of SMEs as well as to get export opportunities and other business opportunities can be done by utilizing the development of Information and Communication Technology (ICT), especially e-commerce (Jauhari, 2010). Website and e-commerce development needs to be done as a means for promotion and marketing of business products, so that it will increase sales volume and increase revenue. This increase in income will eventually develop these small and medium enterprises (Jauhari, 2010). SMEs are required to pay more attention to global market expansion and value creation through R & D investments, as part of their long-term growth and survival strategies (Nino-Amézquita, Legotin & Oleg Barbakov, 2017). The perception of business risk that has an impact on the involvement of SMEs in cluster collaboration and competition risk turns out to be the most important risk indicator.

3. Methodology
3.1 Population, Samples, and Sampling Techniques

This study utilized data collected from SMEs in Malang City, Indonesia. This location was chosen due to the impportance of the city being the second largest city in East Java. As such it is viewed as an industrial city as well as an education a tourism city. The population in this study is the manager of SMEs who are domiciled in Malang City. Based on data in the Malang City Cooperative and SMEs Office, there are a total of 2,764 SMEs assisted. However, only 880 units have been certified, or around 32 percent. The sample size in this study uses the formula for the number of indicators multiplied (5-10) = 18 x 7 = 126. While the sampling technique is Simple Random Sampling.

3.2 Analysis of Exponential Comparison Methods (ECM)
The results of modeling in the first year research activities are used as a reference in designing research activities in the second year. Trial or implementation of the results of the development of the Theory of Planned Behavior model in e-commerce marketing by SMEs in Malang City. The implementation of the model development compiled in the first year will be refined based on the results of the model trials in the second year. Besides that, an in-depth study was also conducted.

Alternative solutions to these factors have begun to be explored to conduct a suitability study between causes and solutions. The weaknesses and strengths of each alternative solution are carefully and deeply identified for further verification. At this stage various opinions and ideas will be explored from various parties, both the government and the people who have high attention to this problem.

The next step is to select various alternatives to choose the best solution. Various alternative solutions are arranged in priority and simulated to obtain maximum results. The process of selecting alternative solutions will be used by the Exponential Comparison Method (ECM), which is a decision support system that describes a complex multi-factor problem into a hierarchy where each level of the hierarchy is composed by several specific elements. With hierarchy, a complex and unstructured problem is divided into groups and then the groups are organized into a hierarchical form. From the method obtained in the form of strategic steps in an effort to increase

team collaboration on work efficiency in SMEs. So, the output at this stage is a recommendation that will be used by SMEs actors in order to take technical policies.

In using the Exponential Comparison Method there are several steps that must be done, namely:
  a. Arrange decision alternatives to be chosen.
  b. Determine criteria or comparisons of important decisions to be evaluated.
  c. Determine the importance of each decision criterion.
  d. Assess all alternatives on each criterion.
  e. Calculates the score or total value of each alternative.

Determine the order of priority decisions based on the score or total value of each alternative.
The formulation of the score calculation for each alternative in the exponential comparison method is:

$$\text{Total value } (TN_i) = \sum_{j=1}^{m} (RK_{ij}) \, TKK_j$$

Where:
  TNi   = Total alternative value to -i
  RK ij = the relative importance of the j criteria in the choice of decision i
  TKK j = the degree of importance of the criteria of the jth decision; $TKK_j > 0$; round
  n   = number of decision choices
  m   = number of decision criteria

Determination of the importance of criteria is done by interviewing experts or through brainstorming agreements. Determination of alternative scores on certain criteria is done by giving the value of each alternative based on the value of the criteria.

3.3 Correspondence Analysis
Correspondence Analysis is part of a multivariate analysis that studies the relationship between two or more variables by modeling lines and columns together from a two-way contingency table in a low dimensional vector space (Greenacre, 2007). The results of correspondence analysis usually show the best dimension for presenting data, which is the point coordinates and a measure of the amount of information that exists in each dimension called inertia (Johnson, 2002).

The stages in the correspondence analysis are as follows:
  a. From the contingency table, the original data is arranged in the form of a matrix and a singular value decomposition is carried out to determine the value of the variability of the original data which is explained by each dimension produced.
  b. Perform correspondence analysis on contingency tables.
  c. Observing the coordinate values and visualizing the plot of row and column vector profiles in each of the closest points for each consideration to describe marketing options through e-commers.

4. Results

4.1 Results of the Exponential Comparison Method (ECM) Analysis
Some considerations of e-commerce marketing decisions by small and medium enterprises (SMEs) in Malang City are related to the attitude of subjective norms, behavioral control, spiritual intelligence, and intentions. In each factor, the amount of consideration given in e-commerce marketing decisions will be analyzed so that the weight of the decision to make a choice will be generated. Decision choices will be divided into three based on the strength of choice, namely: low, medium and high. At the beginning, consumers will be asked to fill the

degree of importance on the factors of consideration in order to produce weight. Then the choice decision will be calculated by the exponential comparison method (ECM) which will be the basis of e-commerce marketing decisions.

Attitude

The results of weight calculations, the calculated weights range from 16.3% to 17.1%. Customer sevice has the lowest weight of 16.3%, while the payment method has the highest weight, which is 17.1%. Four considerations of attitudes include: payment methods (16.9), how to receive orders (16.8%), places to sell products (16.5%), and shipping methods (16.5%). The results of calculations with attitude-based ECM for e-commerce marketing options with online buying and selling in the marketplace are the highest choice then continue with internet banking and SMS competing, as well as cable TV and internet providers. In particular, consideration of options for e-commerce marketing with online buying and selling in the marketplace is, products, how to receive orders, payment methods, shipping methods, and customer sevice (Table 1).

Table 1. Weight of Marketing Options Through E-Commerce Based on Attitude Considerations

Description	Marketing Options Through E-Commerce			Weight
	Buy and Sell Online at Marketplace	Internet Banking and SMS Banking	Cable TV and Internet Provider	
1. Products	5	5	4	0.171
2. Product selling place	4	4	5	0.165
3. How to receive orders	5	4	3	0.168
4. Payment method	5	3	3	0.169
5. Shipping method	5	5	5	0.165
6. Customer sevice	3	4	5	0.163
Score	7.697	7.598	7.583	
Ranking	1	2	3	

Subjective Norm

The results of weight calculations, the calculated weights range from 49.4% to 50.5%. The consideration of friends friends has the lowest weight of 49.4%, while family members have the highest weight, which is 50.6%. Overall consideration from family members is stronger when compared to friends. The results of calculations with subjective norm-based ECM through e-commerce marketing options with online buying and selling in the marketplace became the highest choice, then continued with internet banking and SMS competing, as well as cable TV and internet providers. Specifically the consideration of options for e-commerce marketing with online buying and selling in the marketplace is family members (Table 2).

Table 2. Weight of Marketing Options Through E-Commerce Based on Subjective Norm Considerations

Description	Marketing Options Through E-Commerce			Weight
	Buy and Sell Online at Marketplace	Internet Banking and SMS Banking	Cable TV and Internet Provider	
1. Family member	5	3	3	0.505
2. Friends	4	5	3	0.495
Score	4.24	3.96	3.464	
Ranking	1	2	3	

Behaviour Control

The results of weight calculations, the calculated weights range from 33.1% to 33.5%. The consideration of the availability of hardware has the lowest weight of 33.1%, while the availability of human resources has the highest weight, namely 33.5%. And the weight of consideration for the availability of software is 33.3%. The results of calculations with ECM-based behavioral control through e-commerce marketing options with online buying and selling in the marketplace are the highest choice then continue with internet banking and SMS competing, as well as cable TV and internet providers. In particular the consideration of options for buying and selling online in the marketplace are software availability, hardware availability, and availability of human resources (Table 3).

Table 3. Weighting Marketing Options Through E-Commerce Based on Behavior Control Considerations

Description	Marketing Options Through E-Commerce			Weight
	Buy and Sell Online at Marketplace	Internet Banking and SMS Banking	Cable TV and Internet Provider	
1. Availability of software	5	3	3	0.335
2. Availability of hardware	5	4	5	0.331
3. Availability of human resources	5	5	3	0.333
Score	5.127	4.736	4.590	
Ranking	1	2	3	

Spiritual Intelligence

The results of weight calculations, the calculated weights range from 9.6% to 10.03%. Contemplating what will happen after death has the lowest weight of 9.6%, while finding a problem and trying to choose a way out of that problem with spiritual awareness that I have has the highest weight of 10.3%. Overall the weight of consideration in sequence is to develop one's own theory of life, death, reality, and existence which is 10.2%, aware of the nonmaterial or spiritual aspects of life that are 10.2%, aware of nonmaterial or spiritual aspects namely 10.1%, explore spiritual awareness myself, which is 10.1%, the decision is in accordance with the purpose of life, which is 10.1%, accepts change for the better, 9.9%, develops more than preserving what is known or existing, 9.8%, finding meaning contained in everyday experiences which is 9.7%.

The results of calculations with ECM-based behavioral control through e-commerce marketing options with online buying and selling in the marketplace are the highest choice then continue with internet banking and SMS competing, as well as cable TV and internet providers. Specifically the consideration of options for buying and selling online in the marketplace is contemplating what will happen after death, developing one's own theory of life, death, reality, and existence, being aware of nonmaterial or spiritual aspects, making decisions in accordance with life's purpose, finding meaning daily experience, finding problems and trying to choose the way out of the problem with the spiritual awareness that I have, developing more than just preserving what is known or existing, accepting change for the better (Table 4).

Table 4. Weight of Marketing Options Through E-Commerce Based on Spiritual Intelligence Considerations

Description	Marketing Options Through E-Commerce			Weight
	Buy and Sell Online at Marketplace	Internet Banking and SMS Banking	Cable TV and Internet Provider	
1. Reflect on what will happen after death.	5	3	3	0.096
2. Develop your own theories about life, death, reality, and existence.	5	4	5	0.102

3. Be aware of the nonmaterial or spiritual aspects of life that exist within.	5	3	3	0.102
4. Be aware of nonmaterial or spiritual aspects, can help me feel more centered.	4	5	3	0.101
5. Decisions are in accordance with the purpose of life.	5	5	4	0.101
6. Find the meaning contained in everyday experience.	4	4	5	0.097
7. Find the problem and try to choose the way out of the problem with the spiritual awareness that I have.	5	4	3	0.103
8. Dive into my own spiritual awareness.	4	4	3	0.101
9. Develops more than just preserving what is known or existing.	5	5	5	0.098
10. Accept change for the better.	5	5	5	0.099
Score	11.669	11.526	11.426	
Ranking	1	2	3	

Intention

The results of weight calculations, the calculated weights range from 11.5% to 14.3%. Finding information about e-commerce marketing that provides the best service has the lowest weight of 12.2%, while intending to say the positive thing about e-commerce marketing has the highest weight of 12.9%. Overall, the weight of consideration sequentially is planning e-commerce marketing, which is 12.6%, looking for information about e-commerce marketing, which is 12.6%, has a preference on e-commerce marketing that provides the best service, 12.5%, has The main preference for e-commerce marketing is 12.5%, intending to refer e-commerce marketing so that other SMEs will do 12.4%, intending to do e-commerce marketing in the near future, which is 12.3%.

The results of calculations with intention-based ECM, e-commerce marketing options with online buying and selling in the marketplace became the highest choice then continued with internet banking and SMS competing, as well as cable TV and internet providers. In particular the consideration of the choice for online buying and selling in the marketplace is intending to do e-commerce marketing in the near future, intending to refer e-commerce marketing to other SMEs, intending to say positive things about e-commerce marketing, has the main preference of e-commerce marketing, looking for information about e-commerce marketing, looking for information about e-commerce marketing that provides the best service (Table 5).

Table 5. Weighting Marketing Options Through E-Commerce Based on Consideration of Intentions

Description	Marketing Options Through E-Commerce			Weight
	Buy and Sell Online at Marketplace	Internet Banking and SMS Banking	Cable TV and Internet Provider	
1. Intend to do marketing through e-commerce in the near future.	5	5	3	0.123
2. Planning e-commerce marketing.	3	3	3	0.126
3. Intend to refer e-commerce marketing to other SMEs.	5	5	5	0.124
4. Intend to say positive things about e-commerce marketing.	5	5	3	0.129

5. Has the main preference of e-commerce marketing.	5	4	4	0.125
6. Have a preference on e-commerce marketing that provides the best service.	4	4	3	0.125
7. Looking for information about e-commerce marketing.	5	5	5	0.126
8. Looking for information about e-commerce marketing that provides the best service. 7	5	5	5	0.122
Score	9.673	9.639	9.444	
Ranking	1	2	3	

4.2 Results of Correspondence Analysis

Policy profiles that describe e-commerce marketing options will be illustrated in the relationship between e-commerce marketing considerations and e-commerce marketing options using correspondence analysis. This technique aims to explore the results of mapping the relationship between two variables that are categorized (attributes). Correspondence analysis is an advanced technique based on the results of the distribution of frequency distributions in cross tabulation. Based on its usefulness, correspondence analysis is used to reduce the dimensions of data into smaller and simpler dimensions and is appropriately used for categorical data. The input data is a contingency table that indicates a qualitative association between rows and columns. Correspondence analysis scales the rows and columns in a unit that are mutually compatible, so that each can be displayed graphically in the same low-dimensional space. These spatial maps provide an overview of:

a. Similarity and difference in lines for a particular column category.
b. Similarities and differences in certain column categories,
c. Relationship between rows and columns.

The interpretation of the results in correspondence analysis is the same as the interpretation in the analysis of the main components for the similarity of certain algorithms. The results of correspondence analysis in grouping categories are found in contingency tables, only because the analysis of the main components involves variable grouping. This result is interpreted according to the closeness between the rows and the contingency table columns. Adjacent categories are more similar in terms of their basic structure (Malhotra, 2010). The results of the correspondence analysis in the form of coordinates for the first and second dimensions, are described in Table 6 and Figure 1 below.

Table 6. Correspondent Analysis Results

Attribute	Proportion	Dimensions 1	Dimension 2
Marketing Options Through E-Commerce			
A. Online Buying and Selling in the Marketplace	.496	-.351	-.104
B. Internet Banking and SMS Banking	.328	.186	.343
C. Cable TV and Internet Provider	.176	.644	-.346
Marketing Considerations Through E-Commerce			
1. Products	.064	.218	-.811
2. Place to sell products	.136	.095	.170
3. How to receive orders	.216	-.561	.022

4.	Payment method	.232	.401	.238
5.	Shipping method	.256	-.192	-.033
6.	Customer sevice	.096	.526	-.238

The results of the correspondence analysis calculation show that there are two attributes that are highly considered namely the payment method (A4) and the shipping method (A5). Then in the next sequence is how to receive orders (A3), where to sell products (A2), customer sevice (A6), and products (A1) and finally will be a general consideration of the 3 e-commerce marketing options. The estimated attributes are (1/21):(3/21):(4/21):(5.5/21):(5.5/21):(2/21):(2/21) or if based on the sample size 6:18:24:33:33: 11. Thus the ranking of attributes A1 (1), A2 (3), A3 (4), A4 (5.5), A5 (5.5), A6 (2). The estimated composition of the six attributes is (1/21):(3/21):(4/21):(5.5/21):(5.5/21): (2/21) or if based on the sample size 6:18:24:33:33:11. The strongest choice is in Online Buying and Selling in the Marketplace followed by Internet Banking and SMS Banking and Cable TV and Internet Providers, so that the composition of the data (3/6):(2/6):(1/6) or 49.6%:32.8%:17.6%. or in a sample size of 63:41:21.
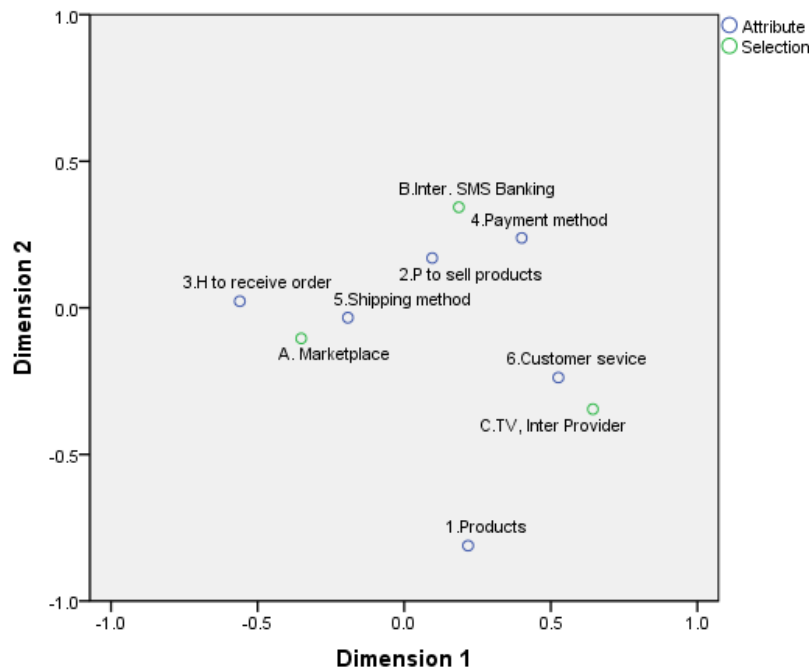
Figure 1. Biplot Graph Between Marketing Options Through E-Commerce and Considerations

Biplot graph between e-commerce marketing options and shows the existence of special characteristics for each choice. Online Buy and Sell options in the Marketplace are 49.6% with considerations: how to receive orders and shipping methods. The choice of Internet Banking and SMS Banking is 32.8% with considerations: the place to sell products and payment methods. Cable TV and Internet Provider options are 17.6% with considerations; customer sevice. Product considerations exist in all options (in the results of the image, the coordinates of the product position are far away with all marketing choices).

5. Discussion of results

5.1 The strategic policy of SMEs in e-commerce marketing using the Exponential Comparison Method (ECM).

The e-commerce marketing selection policy related to attitudes toward e-commerce marketing is online buying and selling in the marketplace. The policy is based on the results of the ECM analysis which shows that online buying and selling in the marketplace is the main choice in e-commerce marketing. Consideration of options for e-commerce marketing by buying and selling online at the marketplace based on products, how to receive orders, payment methods, shipping methods.

The e-commerce marketing selection policy that relates to subjective norms is online buying and selling in the marketplace. The policy is based on the results of the ECM analysis which shows that online buying and selling in the marketplace is the main choice in e-commerce marketing. Consideration of options for e-commerce marketing with online buying and selling in a marketplace based on family members.

The e-commerce marketing selection policy that deals with behavior control is online buying and selling in the marketplace. The policy is based on the results of the ECM analysis which shows that online buying and selling in the marketplace is the main choice in e-commerce marketing. Consideration of options for e-commerce marketing with online buying and selling in the marketplace based on software availability, hardware availability, and availability of human resources.

The e-commerce marketing selection policy related to spiritual intelligence is online buying and selling in the marketplace. The policy is based on the results of the ECM analysis which shows that online buying and selling in the marketplace is the main choice in e-commerce marketing. The consideration of choice for e-commerce marketing with online buying and selling in a marketplace is based on contemplating what will happen after death, developing your own theories about life, death, reality and existence, being aware of nonmaterial aspects or spirituality, making decisions in accordance with life's purpose, finding problem and trying to choose the way out of the problem with the spiritual awareness that I have, developing more than just preserving what is known or existing, accepting change for the better.

The e-commerce marketing selection policy related to intention is online buying and selling in the marketplace. The policy is based on the results of the ECM analysis which shows that online buying and selling in the marketplace is the main choice in e-commerce marketing. Consideration of the choice for e-commerce marketing with online buying and selling in the marketplace based on intending to do e-commerce marketing in the near future, intending to refer e-commerce marketing to other SMEs, intending to say positive things about marketing through e-commerce, has the main preference of e-commerce marketing, looking for information about e-commerce marketing, looking for information about e-commerce marketing that provides the best service.

5.2 Policy profiling for several types of e-commerce marketing using correspondence analysis.

A policy profile that describes the relationship between choices and marketing considerations through e-commerce using correspondent analysis shows the existence of special characteristics in each choice. Online Buy and Sell options in the Marketplace are 49.6% with considerations: how to receive orders and shipping methods. The choice of Internet Banking and SMS Banking is 32.8% with considerations: the place to sell products and payment methods. Cable TV and Internet Provider options are 17.6% with considerations; customer sevice. Product considerations exist in all options (in the results of the image, the coordinates of the product position are far away with all marketing choices).

Conclusions

The strategic policies of SMEs in marketing through e-commerce in Malang City which are related to attitudes towards e-commerce marketing are online buying and selling options in the marketplace with consideration of products, how to receive orders, payment methods, shipping methods. The findings in this study are consistent with previous research (Jin at al., 2015 pp. 101-112), the study found that the dynamics of the causative relationship between variables examined and highlighted the importance of attitudes, subjective norms, trust and consumer behavior in ensuring purchase intentions in the context of Malaysian online purchases. The results of this study support previous studies such as Mamoun at al. (2015, pp. 1353 1376) stated the importance of the perceived website reputation, the relative profitability, trustworthiness and image of the web which were perceived as the main drivers of attitudes towards online shopping.

Policies related to subjective norms are online buying and selling options in the marketplace with consideration for family members. The findings in this study are consistent with previous research (Jin at al., 2015 pp. 101-112), the study found that the dynamics of the causative relationship between variables examined and highlighted the importance of attitudes, subjective norms, trust and consumer behavior in ensuring purchase intentions in the context of Malaysian online purchases. Policies related to behavior control are online buying and selling options in the marketplace with consideration of software availability, hardware availability, and availability of human resources. The results in this study are consistent with previous research (Jin at al., 2015 pp. 101-112), the study found that the dynamics of the causative relationship between the variables examined and highlighted the importance of attitudes, subjective norms, trust and consumer behavior in ensuring purchase intentions in the context of Malaysian online purchases.

Policies related to spiritual intelligence are online buying and selling options in the marketplace with consideration of contemplating what will happen after death, developing their own theories about life, death, reality and existence, being aware of nonmaterial aspects or spirituality, making decisions in accordance with life's purpose, finding problem and trying to choose the way out of the problem with the spiritual awareness that I have, developing more than just preserving what is known or existing, accepting change for the better. The findings in this study are consistent with previous studies (Noroozi at al., 2015 pp. 60-71), stating that spiritual intelligence has a positive and significant effect on behavior. The results of this study support previous studies such as Anwar et al. (2015, pp. 1162-1178) states that spiritual intelligence plays an important role in behavior. Two important dimensions namely critical existential thinking and transcendental awareness of spiritual intelligence have a profound influence on behavior.

While the policy related to intention is an online buying and selling option in the marketplace with the consideration of intending to do e-commerce marketing in the near future, intending to refer e-commerce marketing to other SMEs, intending to say positive things about marketing through e-commerce, has the main preference of e-commerce marketing, looking for information about e-commerce marketing, looking for information about e-commerce marketing that provides the best service. The findings in this study are consistent with previous research (Jin at al., 2015 pp. 101-112), the study found that the dynamics of the causative relationship between variables examined and highlighted the importance of attitudes, subjective norms, trust and consumer behavior in ensuring purchase intentions in the context of Malaysian online purchases. The results of this study support previous studies such as Lima et al. (2015, pp. 1353 1376) states that purchase intention has a significant positive effect on online shopping behavior.

The policy profile on e-commerce marketing in Malang City is (1) The first choice of Online Buying and Selling in the Marketplace with considerations: how to receive orders and shipping methods; (2) Second choice of Internet Banking and SMS Banking with considerations: place to sell products and payment methods; (3) Third choice of Cable TV and Internet Provider with features of consideration; customer service. Product considerations

are in all options. The results of this study support previous studies such as Yu (2007, pp. 84-100) stating that in e-commerce and e-technology has accelerated intra-business and inter-business online transactions between buying and selling with the marketplace and which affects the company's willingness to using e-marketplaces identified through pre-joining, decision to join, and post-joining research structures.

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MULTIPLE DISCRIMINATION AND INEQUALITY: A COMPARATIVE ANALYSIS OF THE EUROPEAN COURTS CASE LAW IN THE CONTEXT OF SUSTAINABLE BUSINESS DEVELOPMENT

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Abstract. In the light of social and economic development multidimensional reality and inequality, the concept of multiple discrimination plays an important role in ensuring to achieve gender equality to stimulate employment and sustainability of business. Such situations in which a person is discriminated on several grounds emerge multiple discrimination. The multiple discrimination complexity redress gender intersectional inequality towards sustainable development and remains as a key challenge. The difficulty with the multiple and intersectional discrimination lies in the lack of awareness and consistent definition of multiple discrimination, patchy legal framework of antidiscrimination law and adequate judicial response. Therefore, one of Sustainable Development Goals encourage achieving gender equality and empowering all women and girls to ensure equality and non-discrimination, women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life. This article is deemed to provide a comprehensive analysis of the multiple, intersectional discrimination based on complex inequality and discusses case law of the Court of Justice of the European Union and European Court of Human Rights from a comparative perspective. Discuss the multiple discrimination interrelationship between the human and fundamental rights framework and the Sustainable Development Goals. A conclusion is made that recognition of the multiple, intersectional discrimination will be an efficient mean for further sustainable business development and combine all ground of discrimination especially in the case of complex inequality at the area of employment.

Keywords: multiple discrimination; anti-discrimination law; sustainable development; employment

1. Introduction

Equality and non-discrimination are fundamental values of the European Union (hereinafter EU) and protected by the anti-discrimination legal framework. These fundamental values consolidated in the constitutional traditions of

all Member States and under international obligations. EU Member States are party to the following human rights treaties: European Convention for the Protection of Human Rights and Fundamental Freedoms (1950) (hereinafter ECHR), International Covenant on Civil and Political Rights (1966) (hereinafter ICCPR), Convention on the Elimination of All Forms of Discrimination against Women (1979), Convention on the Rights of Persons with Disabilities (2006) (hereinafter CRPD), all of which contain a prohibition on discrimination. Also, the 2030 Agenda for Sustainable Development (2015), adopted by the United Nations General Assembly and its 17 Sustainable Development Goals (hereinafter SDGs), have given a new insight to global efforts for achieving sustainable development. The sustainable development is conceptualised under three equal and interconnected dimensions: economic, environmental and social.

SDGs call promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels the achievement of full human potential and sustainable development is not possible if one-half of humanity continues to be denied its full human rights and opportunities. Following the SDGs compulsory to ensure inclusive and equitable business sustainability, important to increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship (United Nations General Assembly 2015). Goal 5 aims to achieve gender equality by ending all forms of discrimination, violence and any harmful practices against women and girls in the public and private spheres, it also calls for the full participation of women and equal opportunities for leadership at all levels of political and economic decision-making (Eurostat 2019).

The EU has highlighted the interconnectedness of all three dimensions of sustainable development and the universal applicability of SDGs, stressing that eradicating poverty and reducing inequality should be a major focus (European Union Agency for Fundamental Rights 2019; Schouten 2019).

Therefore, for example, cases regarding discrimination in the field of employment – EU citizens Muslim women wearing Islamic headscarf were dismissed from work and the following cases involving harmful stereotypes based not only on religion, but first of all on gender and also on race. Such situations based on several grounds pertains intersection between the grounds and cause intersectional discrimination. Examination discrimination from the perspective of insolation of grounds fails to tackle adequately various manifestations of inequality.

In the Fundamental Rights Report, European Union Agency for Fundamental Rights (2019) highlighted, that the EU continued to engage with Member States to support their efforts to advance lesbian, gay, bisexual, transgender and intersex (LGBTI) equality, and several Member States introduced legal and policy measures to that effect. Bans on religious clothing and symbols continued to trigger controversies, meanwhile, the EU and Member States took diverse steps to strengthen the collection and use of equality data, and a range of studies and surveys published provided evidence on the extent and forms of discrimination that people experience in the EU (European Union Agency for Fundamental Rights 2019). Ensuring high employment rates for both men and women is one of the EU's key targets (Eurostat 2019).

The aim of this article is to analyse the legal framework of EU anti-discrimination law and the Court of Justice of the European Union and European Court of Human Rights (hereinafter European Courts) decisions based on a single ground cases in the light of intersection and multiple discrimination. Controversies regarding EU policy and the European Courts decisions are presented in the current research since the issue of multiple discrimination and discrimination grounds intersection is problematic in EU legal framework. Some attention in the Court of Justice of the European Union (hereinafter CJEU) and European Court of Human Rights (hereinafter ECtHR) jurisprudence has been shown already to the multiple discrimination. The article also provides a comparative case law research, which is particularly important in order to ensure the possibility of full realization of the equality and to tackle all forms of discrimination, including multiple and intersectional discrimination and to ensure SDGs.

The paper analysis based on methodological regulations of studies of law, matching ideas of theories of normative and case law. The main data collection method used during the study was method of conceptual analysis. Taking into account the character of the study, the most important data analysis method in this paper is comparative when revealing divergences in the case law of the European Courts.

2. The European anti-discrimination legal framework and the concept of multiple discrimination

In the EU policy regulating equality and non-discrimination there is no settled single consensual terminology or concept of consistent multiple and intersectional discrimination. At the legislative setting for the first-time multiple discrimination problem was recognized by the recital (14) of Race Equality Directive (2000) (hereinafter RED) and recital (3) of Employment Equality Directive (2000) (hereinafter EED) stating the aim to eliminate inequalities, and to promote equality between men and women, especially since women are often the victims of multiple discrimination. According Handbook on European non-discrimination law (European Union Agency for Fundamental Rights 2018), multiple discrimination describes discrimination that takes place based on several grounds operating separately; intersectional discrimination describes a situation where several grounds operate and interact with each other at the same time in such a way that they are inseparable and produce specific types of discrimination.

With the Equal Treatment Directive proposal (2008) European Commission was willing to tackle define and provide effective remedies for complex inequality and multiple discrimination. The proposal was on implementing the principle of equal treatment outside the employment, irrespective of age, disability, sexual orientation or religious belief, which aims at extending protection against discrimination through a horizontal approach. Remaining problem is the inequality for the protecting non-discrimination grounds of different areas of life. EED prohibited discrimination on the grounds of sexual orientation, religion or belief, age and disability, in the area of employment and the RED introduced prohibition of discrimination on the grounds of race or ethnicity in the context of employment, but also in accessing the welfare system and social security, as well as goods and services. Gender Equality Directive (recast) (2006) guarantees equal treatment only in area of social security, and not to the broader welfare system, such as social protection and access to healthcare and education. Although sexual orientation, religious belief, disability and age are only protected grounds in the context of employment, a proposal of Equal Treatment Directive to extend protection to other areas, such as accessing goods and services is currently being debated in EU institutions (European Union Agency for Fundamental Rights 2018).

Table 1. EU legal framework for equal treatment and anti-discrimination

Areas / Basis	Race	Gender	Religion	Age	Disability	Sexual Orientation
Employment	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	No	No	No	No	No
Goods & Services, Houssing	Yes	Yes	No	No	No	No
Social Protection, Healtcare	Yes	Yes	No	No	No	No
Social Advantages	Yes	No	No	No	No	No

Source: European Union Agency for Fundamental Rights (2018)

Thus, multiple discrimination was mentioned in five Resolutions adopted by the European Parliament in 2016. The European Parliament Resolution on application of EED establishing a general framework for equal treatment in employment and occupation (2016) notes and indicated that discrimination because of religion or belief, racial or ethnic origin was always considered to be of the intersectional type and those certain religious minority groups

were particularly discriminated against, on the grounds of religion in employment market, as it was presented in the national and European scientific investigations. First, in the EU studies made by the Fundamental Rights Agency, the participants of the employment market, of which quite often, women were identified as a vulnerable group of discrimination due to gender and race. It is possible to state that, essentially for this group in Europe, there has been given the most attention, though it does not mean that this group is very vulnerable. The European Parliament on application of EED establishing a general framework for equal treatment in employment and occupation (2016), have concerned the considerations on the data of the studies on the religious groups, discriminated against in employment market, they are Jews, Sikhs and Muslims (and especially women); it is recommended to accept European programs for national strategies which would combat anti-Semitism and Islamophobia.

European Parliament Resolution on refugees: social inclusion and integration into the labour market (2016), on social inclusion and integration into the labour market designated that the situation of women's refugee camps in Europe was of particular concern as well as their living conditions and hygiene. It was indicated that women's healthcare needs were different from men's, because they more often faced multiple risks, including gender-based violence, reproductive health issues, and cultural obstacles, in order to access health care, besides that it was considered that the policy of the mentioned above issues could not be gender neutral. The document calls on the Member States to use the Rights, Equality and Citizenship program funds for diversity education and training and delivering information for refugees and migrants wishing to enter the labour market as well as about their rights as employees, lest they become victims of exploitation and employers. It is noted there that the problem of multiple discrimination has to be considered within the policy of migration and integration.

European Parliament Resolution on the implementation of the UN Convention on the Rights of Persons with Disabilities, with special regard to the Concluding Observations of the UN CRPD Committee (2016) indicated that EU had more women with disabilities than men; women with disabilities often faced multiple discrimination. They faced significant obstacles in the exercise of their fundamental rights and freedoms, such as the right to education and employment; it could also lead to social exclusion and psychological trauma. Disabled people were a very diverse group and because women, children, seniors and persons with complex support needs faced additional challenges and multiple discrimination of various forms. The document encouraged to take actions and fight against all kinds of discrimination and multiple discrimination as well as discrimination due to links and connections and intersectional discrimination due to disability. Especially taking into consideration women with disabilities and children, older people, people with complex support needs, including those with intellectual and psychosocial problems, as well as those whose disabilities tend to change over time.

Whereas the European Parliament Resolution on poverty: a gender perspective (2016) highlighted that persons living at risk of poverty, mostly women, were even more vulnerable in the labour market and in social security, especially the groups facing multiple discrimination; studies conducted by the EU Fundamental Rights Agency identified the most vulnerable groups of multiple discrimination that were the following, namely women with disabilities, elderly women, young ethnic minority men, disabled homosexuals and transgender people, elderly homosexuals and transgender people, young homosexuals and transgender people and elderly people with disabilities.

Studies made by the governmental and non-governmental organizations, recognized that people could belong or belong to several less-privileged groups at the same time and nearly all institutions had a tendency to concern themselves with some form of discrimination. Resolution of the Parliamentary Assembly of the Council of Europe Multiple discrimination against Muslim women in Europe: for equal opportunities (2012) underlines that in the Member States of European Union, in which a minority of the population practices Islam, Muslim women are often the victims of stereotypes because of their religious beliefs. Their only aspect that defines their identity

together with the publishing laws on Muslim women, the greatest attention is paid to women's outfit - headscarves or worn veils instead of such issues as non-discrimination and equal opportunities.

This preference is reflected in European Parliament Resolution on application of EED establishing a general framework for equal treatment in employment and occupation (2016), where it was noted that 'it is important to reach agreement as soon as possible'. Besides that, (European Parliament) called on the Council 'to find a way out of this deadlock in order to move towards a pragmatic solution and to speed up the horizontal EU anti-discrimination directive, which in 2008 was proposed by the Commission and voted by Parliament, as an approval without further delay'. This is a prerequisite for ensuring a consolidated and coherent EU legal framework that protects against discrimination on the grounds of religion and belief, disability, age and sexual orientation outside employment. Hence, it is noted there, that according to the European Union Agency for Fundamental Rights, all forms of discrimination, including multiple and intersectional discrimination, severely handicaps, the use of human capital and hampers in career development.

Both Article 14 of the ECHR and additional Protocol No. 12 under ECHR law prohibit discrimination on a large number of grounds, making a claim on more than one ground theoretically possible, furthermore, the non-exhaustive list of grounds of discrimination allows the ECtHR to extend and include grounds not expressly mentioned (European Union Agency for Fundamental Rights 2018). While ECtHR does not use the terms of multiple or intersectional discrimination.

3. Multiple discrimination signs at the case law of CJEU

According the research there are ten cases so far decided by the CJEU in which claims of discrimination invoking multiple grounds, eight cases with two grounds and two cases with 3 grounds, eliminating the cases that have been rejected or dismissed, there are left seven multiple discrimination cases (Xenidis 2018). Xenidis (2018) points that only in five cases multiple grounds were really taken into account and the Court of Justice either did not examine the multiple discrimination claim on substance or formally declined to construct a targeted doctrinal framework to access multiple discrimination.
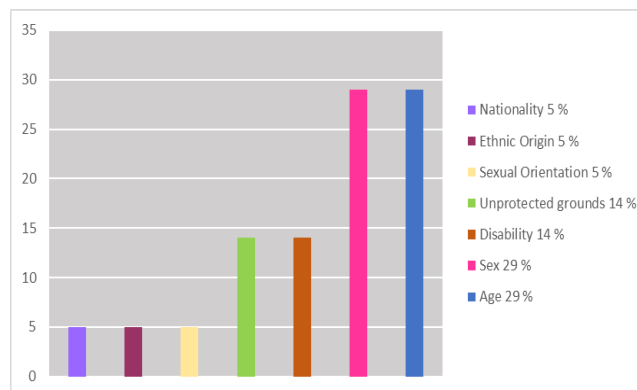
Fig.1. Grounds invoked from 10 cases brought on multiple grounds at the CJEU from 2007 to 2017

Source: Xenidis (2018)

It should be noted, that some cases, which have been submitted for a single ground to CJEU bear the aspects of multiple discrimination and could be examined as the cases of multiple discrimination. *Achbita* (2017) and *Bougnaoui* (2017) cases have been the first cases submitted before the Court of Justice on grounds of religion or belief. The situation in those cases is considered very analogous, the issues raised deals with the issues of employees, citizens of EU, Islamic headscarf in the workplace. The cases have been brought to the CJEU as a

single ground of discrimination based on religion or belief, but when assessing the situation based on the harmful stereotypes formed, the discrimination may be evaluated when based on racial or ethnic origin or gender grounds in the context related to multiple intersectional discrimination.

In the case on *Samira Achbita v. G4S Secure Solutions NV* (2017), the request for a preliminary ruling from the national court, against the employer's interference and ban for his employees at workplaces to wear symbols of philosophical, political or religious beliefs and perform rites related to those beliefs. Such a ban on a Muslim wearing a scarf at the workplace, really constitute direct discrimination. S. Achbita, Muslim, was employed by the company on a permanent contract. This company had an unwritten rule that employees should not wear any visible symbols of their philosophical, political or religious beliefs in the workplace.

Having worked in the company for three years, S. Achbita informed the manager that she was intending to tie an Islamic headscarf during work; she was informed that the scarf tie would not be tolerated because it was contrary to company neutrality policy. The company approved the amendment of the Rules of Procedure in which it was stated that the employees were prohibited from wearing visible symbols of their philosophical, political or religious beliefs in the workplace. The plaintiff was dismissed because of her strong position as a Muslim to tie an Islamic headscarf in the workplace.

The conclusion presented by Advocate General Kokott (2016) stated that Ms. Achbita, like some other Muslims, wore a headscarf for religious reasons and there was no reason to question her religious motivation. She considered that taking into consideration the case law of the ECtHR related to Article 9 of the ECHR and the practice of the majority of national courts and institutions. The Court of Justice should also regard that as sufficient interaction with religion, and therefore the examined case fell within the material scope of the prohibition of discrimination on grounds of religion laid down in EU law.

The Opinion of Advocate General Juliane Kokott (2016) considered that prohibiting Muslim workers from wearing an Islamic headscarf at work was not direct discrimination on the grounds of religion on the grounds. The prohibition was a general corporate rule that prohibited the wearing of visible political, philosophical and religious signs at work and was not based on the stereotypes or prejudices in terms of one or some particular religions or religious beliefs. At the same time, however, the emphasis was on 'such a ban may constitute indirect discrimination on grounds of religion, such discrimination may be justified in order to pursue the employer's policy of religion and belief neutrality, provided that the principle of proportionality is respected' (Kokott 2016).

CJEU in its judgment stated that the ban on the wearing of an Islamic headscarf, stemming from a private company code of practice which prohibited wearing any visible symbol of philosophical, political or religious beliefs in the workplace, did not constitute direct discrimination on the basis of religion or belief. Also noticeable is the fact, that such a rule of procedure set up by a private company may create indirect discrimination, if it has been determined that due to the neutral duty prescribed in it. In reality the persons of a particular religion or belief would be disadvantaged in some respects, unless such an obligation is objectively justified by a legitimate aim and therefore the Court of Justice has left it to the national court to decide (Samira Achbita v. G4S Secure Solutions NV 2017).

Asma Bougnaoui v. Micropole SA (2017) when a reference for a preliminary ruling from the national court was submitted because of A. Bougnaoui dismissal for not refusing to associate with an Islamic headscarf. When providing services to Micropole SA company clients and the employer's desire to take into account the wishes of the client that the services of that employer should no longer be provided by an employee wearing an Islamic headscarf, was an essential and decisive professional requirement. At the time of her recruitment, the applicant was informed that her freedom of expression was respected, as well as personal religious belief, however, she would not be able to wear head dress when working with clients inside or outside the company. On dismissal, A.

Bougnaoui was informed on the fact that the wearing of the Islamic headscarf caused certain inconvenience to the company's customers and did not comply with the necessary principle of neutrality in relation to the company's customers.

Advocate General Eleanor Sharpston (2016), in a similar case reached a different conclusion from Advocate General Juliane Kokott. She proposed 'the rule in the place of work of a company which prohibits employees of a company from wearing religious signs or clothing when communicating with customers of a company and shall be deemed to be direct discrimination on grounds of religion or belief and not subject to derogations from the prohibition of direct discrimination on grounds of religion or belief'. She considered that such discrimination could not be justified or considered to be in the employer's legitimate interest or proportionate purpose (Sharpston 2016).

In this case, the CJEU states that Member States may provide those differences of treatment in respect of a characteristic related to one of the grounds referred to in Article 1 of the EED and they do not constitute discrimination, if, by virtue of the nature of the professional activity or the conditions under which it is pursued. Such a characteristic constitutes an essential and decisive professional requirement, provided that the purpose is legitimate and the requirement is proportionate and noting that the employer's intention to take into account the wishes of the client that his services should no longer be provided by the employee. Namely to tie an Islamic headscarf, should not be regarded as an essential and decisive professional requirement, within the meaning of Article 4 (1) of the EED.

In the cases discussed above, it is important to note that potential discrimination against Muslim women is appreciated taking into consideration the intersection of three grounds – religion and belief, gender and ethnic origin or race. We can see cases of discrimination undoubtedly related to the features of Islamophobia, which exhibits hostility to religion and culture. At the same time, there is gender discrimination as the Islamic headscarf is exclusively associated with a Muslim woman (Vakulenko 2007). It is noteworthy, that many Muslims in Europe suffer discrimination in employment, education and housing, whatever their ethnicity and / or religion is, they are discriminated against because of their Islamophobia and racist and xenophobic intolerance, as the two elements are often intertwined in the positive findings of the European Monitoring Centre on Racism and Xenophobia (2006).

It is noteworthy, that this situation, where the employer sets the rules and demands religious neutrality for the employee's outfit, results in different experiences for a Muslim man or a Christian woman for example (Xenidis 2018). The requirement for a policy of neutrality at work disproportionately affects a Muslim woman who ties an Islamic headscarf as a mandatory religious attribute; however, no any discrimination influence is to the other employees whose religious commitments or beliefs are not expressed in clothing (Samira Achbita v. G4S Secure Solutions NV 2017).

The Report on the state of fundamental rights provided by European Union Agency for Fundamental Rights (2017) shall state, that there are too many people for whom fundamental rights remain an abstract statutory concept rather than a set of effective and practical tools that can change and transform their daily lives in the EU and for the Member States. While still not explicitly addressing multiple discrimination in legislative and policy measures, it is still not clearly addressing multiple discrimination, and should be recognized as multiple and intersectional discrimination in order to make it possible to combat discrimination, to continue following the equal treatment and sustainable development in employment.

4. Religious freedom in the workplace under the case law of ECtHR and international law

While analyzing the case law of the ECtHR on the ground of religious freedom in the workplace, it can be seen that in the case *Eweida and Others v. the United Kingdom* (2013) the right to freedom to express one's religion or belief while wearing a religious symbol in the workplace was recognized. The right to practice religion was not adequately protected by the state authorities because it was not allowed to carry the cross in public in the workplace. In addition, it is important to note that when deciding this case, ECtHR had to weigh the rights of applicants and the legitimate interests of their employers in the public and private sectors and decide whether the applicant's right to freedom of religion was sufficiently protected by the domestic law.

The applicant was employed in a private company British Airways, in the position of check-in for passengers. With the change in airline uniforms, her ever-worn neck-cross religious symbol - the cross, became public and was in contradiction with the rules of wearing the uniform and the corporate image. After several warnings, the woman was suspended from work until she decided to obey the rules. However, the case went public and British Airways hurried to change the rules and allowed to wear a pendant with a cross at work. The applicant was not dismissed but the employer transferred her to the other position where there was no direct contact with the airline customers.

Mrs. Nadia Eweida filed a complaint based on Article 9 of the ECHR on the right to freedom of thought, conscience and religion, both individually and in combination with Art. 14, on religion discrimination, on the grounds that the United Kingdom did not guarantee its right to religion. Article 9 (ECHR) specifically related to religious freedom, the protection afforded by this provision was much broader and encompassed all personal, political, philosophical, moral, religious beliefs, and included ideas, various philosophical beliefs, individually denoting a person's religious faith, as well as each individual's way of understanding his or her individual and social life.

ECtHR rendered a decision denying that the applicant's right to practice her religion while wearing a religious symbol would have been defended by the absence of specific provisions in the domestic law, however the submitted conclusion was that in that particular case. The right balance had not been reached between Nadia Eweida's desire to practice her religious faith and to express it in a way that was known to others and the employer's desire to uphold a particular corporate image (regardless of the legitimacy of that purpose). The decision was noted that British Airways employees were allowed to wear religious clothing, such as a turban or hijab, and the company image was not threatened. The company later changed the rules for wearing the uniform to allow visible jewellery with religious symbolism to show that the previous ban was not vital.

Therefore, it can be concluded that in the case law of the CJEU and the ECtHR on discrimination in the workplace on the grounds of religion, different positions are taken, the use of different religious signs is controversial, noting that they can be of different sizes and meanings. ECtHR seems to tacitly recognise the phenomenon of intersectional discrimination, and in the case *Timishev v. Russia* (2005) it was determined that ethnicity and race are related and overlapping concepts. Whereas the notion of race is rooted in the idea of biological classification of human beings into subspecies according to morphological features such as skin colour or facial characteristics, ethnicity has its origin in the idea of societal groups marked by common nationality, tribal affiliation, religious faith, shared language, or cultural and traditional origins and backgrounds (Timishev v. Russia 2005).

Arousing controversies around laws banning religious clothing or symbols at work or in public spaces, such bans risk disproportionally affecting Muslim women who wear religious clothing. However, even where such laws do not exist, hate-motivated discrimination, harassment or violence against members of a certain religion who wear

religious clothing can have an impact on the right to freedom of religion or belief; this can affect, in particular, Muslim women, Sikhs and Jewish men (European Union Agency for Fundamental Rights 2018).

The constant research conducted by the European Union Agency for Fundamental Rights has identified a number of stereotypes which are recurring in the various Member States, related e. g. to clothing's, in particular with prejudice against the wearing of scarves. Stereotypes about disability and the belief that disability can be fictitious or that older people only pretend to be ill, cultural stereotypes and the belief that HIV /AIDS is prevalent among ethnic or sexual minorities. Cross-systematic application of multidimensional intersectional discrimination, taking all of the grounds of discrimination together, not regulated at legislative level a multidimensional approach to the grounds of discrimination would allow a proper assessment of all cases of discrimination (Carrera et al. 2017).

At the level of international law, intersectionality is officially recognised by the Convention on the Elimination of All Forms of Discrimination against Women Committee as a pertinent concept for understanding the scope of State Parties' obligation to eliminate discrimination (European Union Agency for Fundamental Rights 2018). The Committee stated that, States parties must legally recognise and prohibit such intersecting forms of discrimination and their compounded negative impact on the women concerned (CEDAW 2010).

During the last year, the United Nations Human Rights Committee adopted views in three cases against France regarding religious clothing: two cases concerning the prohibition on wearing a niqab in public (Miriana Hebbadj v. France 2018, Sonia Yaker v. France 2018) and one regarding refusal to allow a worker in a childcare centre to wear an Islamic headscarf (F.A. v. France 2018). In all three cases, the committee found a violation of the right to religion (Article 18 of the ICCPR) and intersectional discrimination on the grounds of gender and religion (Article 26 of the ICCPR).

Conclusions

In principle, although various legal acts recognize the need to ensure the recognition of multiple and intersectional discrimination and the adoption of the Equal Treatment Directive, the proper fight against discrimination has to be ensured, which would provide a comprehensive legal framework. Currently, the problem remains unresolved due to the lack of unanimity as required by the EU Council, in order to be possible to adopt the horizontal resolution and thus multiple gaps in the legal framework for discrimination remain in EU anti-discrimination law and remains clearly grounded, with a certain hierarchy of grounds for discrimination.

There is also the need to recognize multiple, intersectional discrimination, for which the identification, comparison and overall analysis of the grounds of discrimination is of great importance, as this may highlight the disadvantage to which the individual is discriminated, while ensuring the practical implementation of fundamental rights.

There are various stereotypes of perception related to personal characteristics or characteristics such as religion and ethnicity and migrant status, culture, age, gender, or various social groups or individuals can experience any combination of these characteristics and multiple or intersectional discrimination. Notably, comparisons of basics and complex analysis can help to better understand how people experience discrimination in their daily lives, as well as helping to raise awareness of unconscious discrimination, to break down stereotypes and prejudices and, accordingly, to devise legal and political instruments to ensure effective equality.

The elimination of discrimination based on a single cause is not expected to highlight the wide variety of cases of multiple discrimination that people in the European Union experience in their daily lives. The vagueness and

imprecision of the term multiple discrimination causes the issue of legal relevance and benefit of anti-discrimination.

It is noteworthy, that regardless of the interaction between social categories, the theory of interactional attitudes and disregarding the basics of religion, gender, and ethnicity, intersectional interaction and social identity, the effect of a synergy of these factors acting together, on a Muslim woman, remains invisible and undisclosed. Such prohibitions appear to have a disproportionate impact on Muslims who choose to wear certain clothing because of their religious identity or beliefs, and may discriminate not only on the basis of religion but also on the basis of ethnicity and gender.

In theory, all Member States can tackle multiple discrimination within the employment market. It is true that most Member States do not consider that way, although multiple discrimination can occur in any area, however, according to CJEU case law cases it is most commonly related to the employment. There is a case law of the ECtHR, United Nations Human Rights Committee views in this area, sufficient data have been collected, and a research has been done. Recognition of the multiple, intersectional discrimination will be an efficient mean for further sustainable business development and combine all ground of discrimination especially in the case of complex inequality at the area of employment.

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MODELLING PROMOTION STRATEGIES IN LOCAL GOVERNMENT UNITS WITH THE APPLICATION OF STRUCTURAL EQUATION MODELLING (SEM) WITH AN EXAMPLE OF WARMIA AND MAZURY REGION[*]

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Abstract. The self-government of the Warmińsko-Mazurskie Province (*województwo warmińsko-mazurskie*) has implemented one of the first image-centered promotion strategies in Poland to promote the region. Its promotion strategy was a result of the campaign termed "Mazury Cud Natury - The Wonder Of Nature" launched in 2009 and constituted especially by image-centered actions targeted at tourists and representatives of the surroundings of the Warmińsko-Mazurskie Province, with no specific segmentation of the remaining recipients. What is more, the "Mazury Cud Natury - The Wonder Of Nature" has been the first operation of the kind run at such a scale in Poland. Nearly all of the local government units in the Warmińsko-Mazurskie Province, supported by numerous non-profit organizations and the private sector, have become actively involved in the campaign. The paper presents the characteristics and application of sample statistical tools developed to evaluate the efficacy of the adopted promotion strategy in the above mentioned region.

Keywords: territorial marketing; promotion strategy; region; structural equation modelling

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1. Introduction

The new socio-economic reality presents fresh challenges and goals to local government units. Influencing one's views and attitudes through tailored measures should generate the ways of target audience behavior as expected by and in the interest of a given unit. With respect to residents, it could be, amongst other things, the creation of proper conditions of life and personal development, the development of socially accepted patterns of behavior in the area of economic and non-economic activity, the activation of local communities centered on important personal development goals, the development of individual enterprises, the promotion of cultural and historical heritage of a settlement unit, or the creation of a positive image of a given unit (Szromnik, 2008).

As a consequence of a modification of the marketing concept, new marketing fields have been created and reinforced. One of them is territorial marketing (also referred to as communal marketing) (Szromnik, 2008). Its unique underlying features are strongly related to the properties of a given location. In literature, we can also find terms such as country marketing, region marketing and city marketing.

The self-government of the Warmińsko-Mazurskie Province (*województwo warmińsko-mazurskie*) has implemented one of the first image-centered promotion strategies in Poland to promote the region. Its promotion strategy was a result of the campaign termed "Mazury Cud Natury - The Wonder Of Nature" launched in 2009 and constituted especially by image-centered actions targeted at tourists and representatives of the surroundings of the Warmińsko-Mazurskie Province, with no specific segmentation of the remaining recipients. This was because the region of Warmia and Mazury is a typical tourist area of Poland, of an ecological nature. Development trends, whose direct implication has become excessive exploitation of nature, maximization of world consumption, are being questioned today by experts pointing out the social costs of these processes. The care for the future, for the common good of future generations is beginning to be defined by social researchers in terms of civilizational challenges. It's worth to add, that ecological problems treated as direct implications of unchecked technological advancement, devoid of any reflection on the condition of civilization, are tackled by representatives of all science disciplines (Jucker, Mathar 2015; Ul Haque 2019; Tkachenko et al. 2019; Polozova et al. 2019; Smaliukienė, Monni 2019). What is more, the "Mazury Cud Natury - The Wonder Of Nature" has been the first operation of the kind run at such a scale in Poland. Nearly all of the local government units in the Warmińsko-Mazurskie Province, supported by numerous non-profit organizations and the private sector, have become actively involved in the campaign. Today, despite the fact that the campaign is over and the authorities of the Warmińsko-Mazurskie Province are pursuing yet another marketing strategy, we continue to see the effects and impact of the "Mazury Cud Natury - The Wonder Of Nature" campaign on the image of the Warmia and Mazury region. One aspect worth notice is that the described campaign has become an inspiration for other provinces which draw on the experience of the authorities of the Warmińsko-Mazurskie Province to pursue their own promotion strategies. Given the above and the results of pilot studies, the focus of the study was the analysis of the image of the Warmia and Mazury region.

The author concentrated on the analyses pertaining to the Warmińsko-Mazurskie Province, which is an equivalent of the NUTS 2 level and which, for geographic and historic reasons, is referred to as the Warmia and Mazury region.

The research goal was to determine the strategic factors of the strategy of promotion applied in the region. The research paper comprises author's own research findings. In the key phase of the research process, an empirical research method in the form of a diagnostic survey with a questionnaire technique and a survey were employed.

Upon research data collection, a research process followed, which involved statistical methods and techniques. The statistical analysis of the research results performed with the use of the Statistica 9.1 package (StatSoft, 2010), the principal method applied was the Structural Equation Modelling (SEM) with the use of exploratory

factor analysis (EFA) to uncover the correlated groups of potential strategic factors having an impact on the effectiveness of the pursued promotion strategy. The use of the specified methods have allowed the author to determine which of the potential factors are of strategic nature.

2. The Use of Promotion Strategy in the Creation of Territorial Unit's Image

In the times of increasingly intense competition for gaining investors', residents' and tourists' interest, the issues associated with the promotion of local government units are becoming ever more important. This is because promotional activities may boost the exposition of given unit's key resources and, consequently, promote long-term regional development.

The implementation of marketing actions requires suitable planning and coordination. A marketing strategy is a set of foreseeable marketing undertakings with the application of which a settlement unit intends to affect certain groups of recipients. Territorial units (local governments) conduct multi-stage activities aimed at increasing the efficacy of implemented strategies.

Analyzing is the first stage of the marketing strategy where needs and expectations of the target audience on both the internal and external markets are analyzed (Domański, 1997). It is simultaneously the stage of analysis of the potential of a given local community against the background of the potential of any neighboring communes, cities and regions (the effect of competitiveness or complementarity of local resources).

Planning is the second, most elaborated stage, involving the planning of factual actions regarding the policy of development of a given community in various aspects and with respect to diverse groups of recipients (market segments analyzed at stage one). At this stage, general goals and directions of strategic development of a given local community are set. It often seems to be underestimated, despite its leading role for the strategy's cohesiveness. The lack of a clear guideline and the direction of development leads to resource dispersion and an impasse. Extensive consultations are required here, including a number of communities and institutions forming the network of local relations.

For a marketing plan to become implemented as expected, all of the above specified stages should be accomplished with the strong support of external companies, such as advertising and marketing agencies etc.

The final stage, supervision, is observation of actions in the phase of marketing strategy implementation. Supervision should be conducted both by external institutions, such as special local government committees, independent expert bodies, and independent advisory companies (Domański, 1997). **One ought to carefully watch whether the actions are conducted according to schedule and whether they are headed in the direction prescribed in the first place.**

There is a number of bodies involved in the creation of an image of a local government unit: local authorities, organizations, associations and enterprises operating in the territory of a given unit, residents, mass media and tourists (Grzegorczyk, Kochaniec, 2010).

Local authorities and residents are those who have the most considerable impact on the creation of an image of a unit. The policy of the authorities shapes the way in which a city is perceived and assessed and points at the direction of its development. Moreover, promotion policy also has an influence on one's image, for not only the real offer but also its projection and highlighted features are of importance.

Promotion activities should be oriented, i.e. they may not include too many target groups. It is worth noting that the message on which a desired image communication need to be based should be concise and consistent.

Every step in the process ought to be driven by the use, in varying proportions, of the instruments of image promotion, such as: advertising, public relations, direct marketing, personal sales, etc. (Glińska, Florek, Kowalewska, 2009). Having specified the instruments used to build a desired image, persons and cells responsible for the implementation of individual tasks must be appointed.

All of the above actions are aimed at influencing the effectiveness of the image as much as possible. Despite the widespread use of the term 'efficiency' in relation to the functioning of an organization, there are still some difficulties in defining it. E. Skrzypek defines efficiency as the ability of each organization to implement strategies and achieve planned goals. The author emphasizes that it depends on doing a good job and the right things in the right way (Skrzypek 2000, Chrząścik 2018).

3. Description of Author's Research of Promotion Strategy Modelling

Over the period 2009 - 2017, the author of the paper focused on the analysis of the effectiveness of the promotion strategy of the Warmia and Mazury region, the effect of which was the promotional campaign "Mazury Cud Natury - The Wonder Of Nature". The contents below will not account for the results of all the research but will rather be an overview of the applied structural equation modelling method. The purpose of the whole research study was to develop of models of a promotion strategy for the management of a region's image. Due to its extensiveness, the sub-chapter presents only an extract from the research in order to demonstrate the operating diagram and the research procedure. The author's earlier research allowed determining the promotion strategy used by the Warmia and Mazury region as effective. Due to the tourist nature of the region, the effectiveness of the "Mazury Cud Natury - The Wonder Of Nature" campaign was studied on entities such as tourists.

To develop and, subsequently, verify the author's models, actions were undertaken to analyze the complete process of Warmia and Mazury region's image management. One of the elements of the models are strategic determinants of the effectiveness of the strategy, which are key to the whole process under which the adopted promotion strategy is used. In the studied case, where over one hundred various entities are pursuing one strategy and at the same time have an impact (quite low) on its entire course, what is of essence is to point out groups of the above mentioned strategic factors, for they constitute the foundation for the evaluation of the effectiveness of implemented promotional activities.

In order to determine the groups of potential strategic factors affecting the effectiveness of the promotion strategy in the process of management of the Warmia and Mazury region's image, world literature and reports showing results of research on region competitiveness were analyzed. A highly interesting source of information turned out to be a publication of a team of scientists originating from three countries: Italy, Switzerland and China, which investigate the topic related to region development strategy implementation. Its authors attempted to distinguish strategic factors influencing strategy implementation in their countries. Their research findings confirm the previous conclusions, i.e. that among the strategic factors of region development are:
- organizational,
- human capital-related,
- infrastructural,
- inter-organizational partnership factors (Li, Gouhui, Eppler, 2008).

Another absorbing report supporting the choice of strategic factors to be employed in the author's model development is a document designed by the Standing Committee for Economic and Commercial Cooperation of the Organization of the Islamic Cooperation (COMCEC) entitled "Effective Tourism Marketing Strategies". Tourism in Arab countries is known to be one of the principal branches of their economies. The report comprises

an analysis of the strategies of promotion of tourist areas, such as: Nigeria, Azerbaijan, Saudi Arabia, Turkey, Egypt and Mozambique. It further outlines how the said countries implemented into their own strategies of promotion various elements from other countries from all over the world. There, we could also find numerous valuable case studies on territorial marketing and tourism. The report presents a model of strategic factors of effectiveness of promotional activities which comprises four elements: inter-sectoral cooperation, human resources, advanced technology, managerial-organizational factors (COMEC, 2015).

Given the above specified research studies presented in world literature and reports of acknowledged organizations, the direction to establish the strategic factors responsible for the effectiveness of realization of the strategy of promotion of the Warmia and Mazury region was taken.

Finally, it was assumed that the potential strategic factors would be selected from amongst the following five groups of factors: technological factors, organizational factors, managerial factors, competence factors (associated with human resources) and factors related to inter-organizational relations.

Next, seven experts were designated, specialists for promotion in Polish Marshal Offices and, with the technique of an interview, potential strategic factors were determined. The selected detailed factor groups are presented below.

Technological factors relate to the technological capacity of an organization to generate and absorb innovative solutions in the area of promotional instrument use (see Table 1).

Table 1. Technological factors

Technological factors	
(technology, resources, ties)	
T 1	Autonomous research and development involving innovative regional products, processes, organizational/ marketing solutions
T 2	Research and development in cooperation with R&D units, institutes and universities
T 3	Research and development jointly with other companies
T 4	Outsourcing of research and development
T 5	Autonomous development of promotion strategy elements
T 6	Team competent to produce marketing tools
T 7	Own technical infrastructure (hardware/software)
T 8	Major expenditure for marketing activities
T 9	Outsourcing of marketing tools
T 10	Use of state-of-the-art information technologies (IT)
T 11	Close technical cooperation with partners

Source: Own research.

An important element of **organizational factors** is work organization within an organization (amongst other things: organizational structure, system of communication). The system of work organization may not limit employee potential. Instead, it should encourage their creativity and provide opportunities for them to come up with and implement their own ideas (Table 2).

Table 2. Organizational factors

Organizational factors	
(organizational structure, model of cooperation with surroundings: association membership, cluster initiative)	
O 1	Size of organization and its financial resources
O 2	Flexible (flat) organizational structures based on task teams
O 3	Preference for team work
O 4	Clear division of tasks between employees
O 5	Efficient information system facilitating internal communication
O 6	High level of organizational structure
O 7	Outsourcing tasks (outsourcing, subcontractors)
O 8	Cooperation with other organizations in the form of associations (e.g. NGOS)
O 9	Cluster-membership (cluster initiative)
O 10	Network-membership (networking with other entities)

Source: Own research.

Managerial factors are associated with decisions made by the authorities of territorial units. Despite the fact that decisions relate to a number of areas of company operations (e.g. financial, HR), the key decisions are those which define the strategy of development (Table 3).

Table 3. Managerial factors

Organizational factors	
(strategies of promotion based on: vision of authorities, innovation, benchmarking; results of image research studies)	
Z 1	Implementation of the strategy of promotion based on the local authorities' marketing vision
Z 2	Separating from competition by searching for new tendencies in promotional and branding activities
Z 3	Strategy of promotion based on open innovation implementation
Z 4	Searching for a market niche for new marketing solutions
Z 5	Introducing employees to the strategy of promotion based on branding research
Z 6	Application of good and verified solutions used by competition
Z 7	Use of methods of project management
Z 8	Relation establishment as part of cooperation principles
Z 9	Effective use of key (most important for an organization) employee competencies of employees
Z 10	Inspiring employees to look for new solutions
Z 11	Implemented system of awarding employees bonuses for innovation
Z 12	Positive attitude of the management to state-of-the-art solutions as part of promotion instrument use
Z 13	Continuity of organization's management

Source: Own research.

Competency factors

The competency-based organization involves that competencies, as strategic resources, precondition organization's survival and development and constitutes the foundation for gaining a lasting competitive advantage. Gaining competitive advantage depends, to a large extent, on the skills relating to knowledge, experience and skill acquisition and application (Table 4).

Table 4. Competency factors

Competency factors	
(intelligent organization, intellectual capital, knowledge, know-how, learning by doing, crowdsourcing)	
K 1	Knowledge and technological competencies of company management
K 2	High qualifications of the management staff
K 3	High technological competencies of employees
K 5	High employee skills in the area of management
K 6	Employee tacit knowledge sharing
K 7	Managing a portal to allow knowledge exchange between cooperating employees of the organization
K 8	Organization knowledge management (knowledge banks, knowledge portals)
K 9	Good insight into the market and behavior of competition
K 10	Learning by doing
K 11	Acquisition of *know how*-type knowledge
K 12	Employee participation in practical placements and internships outside the organization
K 13	A system of incentives and financial support for employees furthering their qualifications (courses, training, postgraduate studies)
K 14	Employee participation in academic symposia and conferences

Source: Own research.

Formal and informal ties of an organization within and outside the industry were included in the **factors related to inter-organizational ties** (Table 5).

Table 5. Factors related to inter-organizational ties

Factors related to inter-organizational ties	
P 1	Ties under provincial administration
P 2	Ties under a strategic alliance
P 3	Ties under a non-profit organization
P 4	Ties under the special economic zone
P 5	Ties under scientific research contracts
P 6	Ties under a self-regulatory organization
P 7	Territorial ties
P 8	Ties under a self-regulatory organization
P 9	Informal ties - friendships with other company leaders
P 10	Informal ties - contacts made at fairs
P 11	Informal ties with academic staff
P 12	Informal ties - close links to the end-user
P 13	Cooperation with other companies
P 14	Economic chamber, professional association membership

Source: Own research.

According to data presented in PWN Encyclopaedia and regarding Poland's administrative division, the Warmińsko-Mazowieckie Province is composed of 19 poviats, 16 urban communes, 33 urban-rural communes and 67 rural communes. In the course of the cognitive process, the following local authorities were selected for research purposes: Marshal Office (*Urząd Marszałkowski*) in Olsztyn (Department for Promotion Coordination and Departament of Tourism), 19 Poviat Starost's Offices (*starostwo powiatowe*), 16 Town Councils (*urząd miejski*) and 100 Commune Offices (*urząd gminy*). The entities totaled to 135 local authorities. The research covered all of the local authorities. As a result, 111 correctly filled surveys were collected, including surveys from

the Marshal Office, 16 Poviat Starost's Offices (84.2%), 13 Town Councils (81.25%) and 81 Commune Offices (81%).

Several distribution channels were employed in order to disseminate the survey in the research proceedings. The first method of evidence collected was to conduct an interview with a single respondent. The majority of the cases were conducted by phone. Furthermore, the contents of the survey with the request to complete it were posted online.

4. Methodology of author's own analysis of promotion strategy modelling with the application of structural equation modelling on a selected group of factors

Upon research data collection, the last stage of the research process followed, which involved statistical methods and techniques. In order to determine the potential strategic factors of promotion strategy effectiveness, the author decided to use the so-called exploratory factor analysis (EFA), as suggested by, amongst others, T. Asparouhov and B. Muthen (Asparouhov, Muthen, 2009). The application of the method (by principal component analysis) led to the limitation of the large group of primary factors. Thereby, potential strategic factors specified further on have been listed.

In the overview of the analysis, it must be said that respondents carried out an assessment of the strategic importance of primary variables for promotion effectiveness in the scale from 1 to 5. The method applied to isolate the principal components with the Varimax rotation allowed the author to distinguish three principal components which were further tested with the Structural Equation Modelling. The objective of the analysis was to determine the power of the strategic factor relationship and the level of its impact on the strategy of promotion in a given province.

The basis for the structural equation modelling (SEM) were the results of both empirical studies and the conducted exploratory factor analysis (EFA).

Further on in these considerations, the idea of a factor will stand for a latent (non-observable) variable representing one or more observable primary variables. Structural equation modelling is one of the statistical methods used to examine the relationships among observable variables and factors involving non-observable causality of a factor. The method enables one to analyze the **cause and effect relationships**, as in the case of regression analysis, and additionally - to conduct an analysis of correlations.

The structural equation model developed on the basis of observable variables is a general statistical model, the special cases of which are regression analysis (simple, multiple and complex), ANOVA (and MANOVA and ANCOVA), path analysis and econometric models. The number of equations in a model equals the number of endogenous variables in the model. Equations are solved for endo- and exogenous variables observed directly without error.

Assuming (by way of an example), that there are two endogenous variables and three exogenous variables, and that some parameters in the structural matrices **B** and **Γ** are zero, the structural equation model shall be expressed as follows in matrix form (Konarski, 2019):

$$\begin{bmatrix} y_1 \\ y_2 \end{bmatrix} = \begin{bmatrix} 0 & 0 \\ \beta_{21} & 0 \end{bmatrix} + \begin{bmatrix} y_1 \\ y_2 \end{bmatrix} = \begin{bmatrix} \gamma_{11} & 0 & 0 \\ 0 & \gamma_{22} & \gamma_{23} \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} + \begin{bmatrix} \xi_1 \\ \xi_2 \end{bmatrix}$$

$$= \begin{bmatrix} \gamma_{11}x_1 + \xi_1 \\ \beta_{21}y_1 + \gamma_{22}x_2 + y_{23}x_3 + \xi_2 \end{bmatrix}$$

The above presented model of structural equations can be depicted in the way shown in Figure 1.
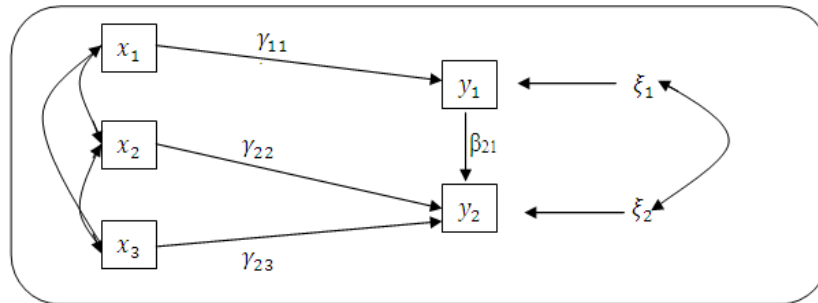
Fig. 1. Graphic representation of a two-equation structural equation modelling for observable variables

Source: R. Konarski, *Modele równań strukturalnych. Teoria i praktyka,* Wydawnictwo Naukowe PWN, Warszawa 2019, p. 126.

Thus, the structural equation model may be depicted either in the form of a set of equations or a graphic scheme. In this study, the graphic representation has been adopted and the following common designations have been assigned to all of the below shown model diagrams:

- ▭ - observable variable,
- ⬭ - non-observable (latent) variable,
- ⟶ - cause-and-effect relationship,
- the figure above the arrow stands for the path co-efficient,
- the figure next to the observable variable stands for the R2 determination co-efficient,
- e - is a random component of a variable.

To model the structural equations, Statsoft Statistica 9.1 was employed. To design the graphic representation of the model, Navicat Data Modeler Essentials was used.

5. Underlying research and research findings. Verification of the employed statistical methods.

Respondents performed an evaluation of strategic importance of primary variables for promotion effectiveness on a scale from 1 to 5. The results of respondent assessment of individual indicators are presented in the tables below.

The calculations show that the applied method of isolating principal components with the Varimax rotation allowed to distinguish principal components with eigenvalues higher than 1 and accounting in total for over 60.7% of factor variability.

Therefore, the exploratory factor analysis conducted on the basis of the resultant empirical data and the principal component analysis (PCA) allowed to distinguish the principal components, i.e. new, non-correlated factors which preserve the maximum of the original data variation. The said factors are found to be initial potential strategic factors of promotion strategy efficacy, each of which groups specific primary variables.

The potential strategic factors of promotion strategy efficacy are presented below (Table 6, Table 7, Table 8, Table 9, Table 10):

Table 6. Specification of potential technological strategic factors and primary variables

Factor	Primary variable	
CT1	**T 4**	Outsourcing of research and development
	T 9	Outsourcing of marketing tools
	T 10	Use of state-of-the-art information technologies (IT)
	T 11	Close technical cooperation with partners
CT2	**T 1**	Autonomous research and development involving innovative regional products, processes, organizational/ marketing solutions
	T 2	Research and development in cooperation with R&D units, institutes and universities
	T 3	Research and development jointly with other companies
CT3	**T 5**	Autonomous development of promotion strategy elements
	T 6	Team competent to produce marketing tools
	T 7	Own technical infrastructure (hardware/software)
	T 8	Major expenditure for marketing activities

Source: Own research.

Table 7. Specification of potential organizational strategic factors and primary variables

Factor	Primary variable	
CO1	**O 5**	Efficient information system facilitating internal communication
	O 6	High level of organizational culture
CO2	**O 7**	Outsourcing tasks (outsourcing, subcontractors)
	O 10	Network-membership (networking with other entities)
CO3	**O 1**	Size of organization and its financial resources
	O 9	Cluster-membership (cluster initiative)
CO4	**O 3**	Preference for team work
	O 4	Clear distribution of tasks among employees

Source: Own research.

Table 8. Specification of potential managerial strategic factors and primary variables

Factor	Primary variable	
CZ1	**Z 2**	Separating from competition by searching for new tendencies in promotional and branding activities
	Z 3	Strategy of promotion based on open innovation implementation
	Z 4	Searching for a market niche for new marketing solutions
	Z 8	Establishment of relations as part of cooperation principles
	Z 9	Effective use of key (most important for an organization) employee competencies of employees
CZ2	**Z 5**	Introducing employees to the strategy of promotion based on branding research
	Z 12	Positive attitude of the management to state-of-the-art solutions as part of promotion instrument use
	Z 13	Continuity of organization's management
CZ3	**Z 10**	Inspiring employees to look for new solutions
	Z 11	Implemented system of awarding employees bonuses for innovation

Source: Own research.

Table 9. Specification of potential competence strategic factors and primary variables

Factor	Primary variable	
CK1	**K 1**	Knowledge and technological competencies of company management
	K 2	High qualifications of the management staff
	K 8	Organization knowledge management (knowledge banks, knowledge portals)
	K 9	Good insight into the market and behavior of competition
	K 11	Acquisition of *know how*-type knowledge
CK2	**K 7**	Managing a portal to allow knowledge exchange between cooperating employees of the organization
	K 13	A system of incentives and financial support for employees furthering their qualifications (courses, training, postgraduate studies)
	K 14	Employee participation in academic symposia and conferences
CK3	**K 3**	High technological competencies of employees
	K 5	High employee skills in the area of marketing

Source: Own research.

Table 10. Specification of potential inter-organizational ties-related strategic factors and primary variables

Factor	Primary variable	
CP1	**P 1**	Ties under provincial administration
	P 4	Ties under the special economic zone
CK3	**P 9**	Informal ties - friendships with other company leaders
	P 14	Economic chamber, professional association membership
CP2	**P 11**	Informal ties with academic staff
	P 12	Informal ties - close links to the end-user

Source: Own research.

The next stage of the research involved an analysis of the newly acquired strategic factors, as presented below:

CT1 – Company external activity and use of state-of-the-art technologies
CT2 – Research & development activity
CT3 – Own personnel resources and technical infrastructure and own budget for promotion activities

CO1 – High level of organizational culture based on efficient communication system
CO2 – Cooperation and outsourcing need
CO3 – Active cooperation with a view to developing strategic organizational position

CZ1 – Openness to an innovative approach to promotional campaign management
CZ2 – Management that is stable and has a positive attitude to modern tool application
CZ3 – Management that has leadership competencies with respect to promotion strategy implementation

CK1 – High competencies of the management with respect to technology and organization's knowledge management
CK2 – Use of modern systems of employee knowledge exchange and use of motivation factors
CK3 – Employee specialist knowledge and experience

CP1 – Inter-relations among territorial and industry units
CP2 - Informal ties with academic staff

The next step involved an analysis of the degree of power of the cause-and-effect relationships among the strategic factors with the application of the structural equation modelling method. The below presented models of structural equations have been developed for the purpose of the study.

As mentioned before, to model the structural equations, Statsoft Statistica 9.1 was employed. To design the graphic representation of the model, Navicat Data Modeler Essentials was used.

As presented in the Diagram 1, in **MODEL 1**, pertaining to the impact of technological strategic factors on promotion strategy efficacy, within the measurement models we can find relatively strong and statistically significant relations between each of the exogenous variables (CT1, CT2, CT3) and the primary variables which explain them.

Thus, on the basis of the results of the study, we ought to assume that the **strategic determinants of promotion strategy efficacy**, i.e. the factors having the most significant positive effect on the efficacy of the promotion strategy, in the area of technological factors are:
CT2 – Research & development activity
CT3 – Own personnel resources and technical infrastructure and own budget for promotion activities
*DS signifies EFFICACY of a strategy of promotion implemented by territorial units of Warmia and Mazury

Diagram 1. Model of technological factors on the efficacy of the promotion strategy
Source: Own research.

In MODEL 2, which refers to the impact of potential strategic factors of promotion strategy efficacy - organizational factors - on the efficacy of the promotion strategy, presented in Diagram 2, factors CO1, CO2, CO3, CO4 were included as latent exogenous variables.

Therefore, on the basis of the results of the study, we ought to assume that the **strategic determinants of promotion strategy efficacy**, i.e. the factors having the most significant positive effect on the efficacy of the promotion strategy, in the area of organizational factors are:

CO1 – High level of organizational culture based on efficient communication system explained by the following variables: Efficient information system facilitating internal communication; High level of organizational culture.
CO4 – Transparency of the rules of operation based on team-building explained by the following variables: Preference for team work; Clear distribution of tasks among employees.
(verte).

Diagram 2. Model of organizational factors on the efficacy of the promotion strategy
Source: Own research.

In MODEL 3, which refers to the impact of potential strategic factors of promotion strategy efficacy - managerial factors - on the efficacy of the promotion strategy, presented in Diagram 3, factors CZ1, CZ2, CZ4 were included as latent exogenous variables.

Based on the results of the study, we ought to assume that the **strategic determinants of promotion strategy efficacy**, i.e. the factors having the most significant positive effect on the efficacy of the promotion strategy, in the area of managerial factors are:

CZ1 – Openness to an innovative approach to promotional campaign management explained by the following variables: Separating from competition by searching for new tendencies in promotional and branding activities; Strategy of promotion based on open innovation implementation; Searching for a market niche for new marketing solutions; Establishment of relations as part of cooperation principles; Effective use of key (most important for an organization) employee competencies of employees

CZ2 – Management that is stable and has a positive attitude to modern tool application explained by the following variables: Introducing employees to the strategy of promotion based on branding research Positive attitude of the management to state-of-the-art solutions as part of promotion instrument use Continuity of organization's management

CZ3 – Management that has leadership competencies with respect to promotion strategy implementation explained by the following variables: Inspiring employees to look for new solutions Implemented system of awarding employees bonuses for innovation
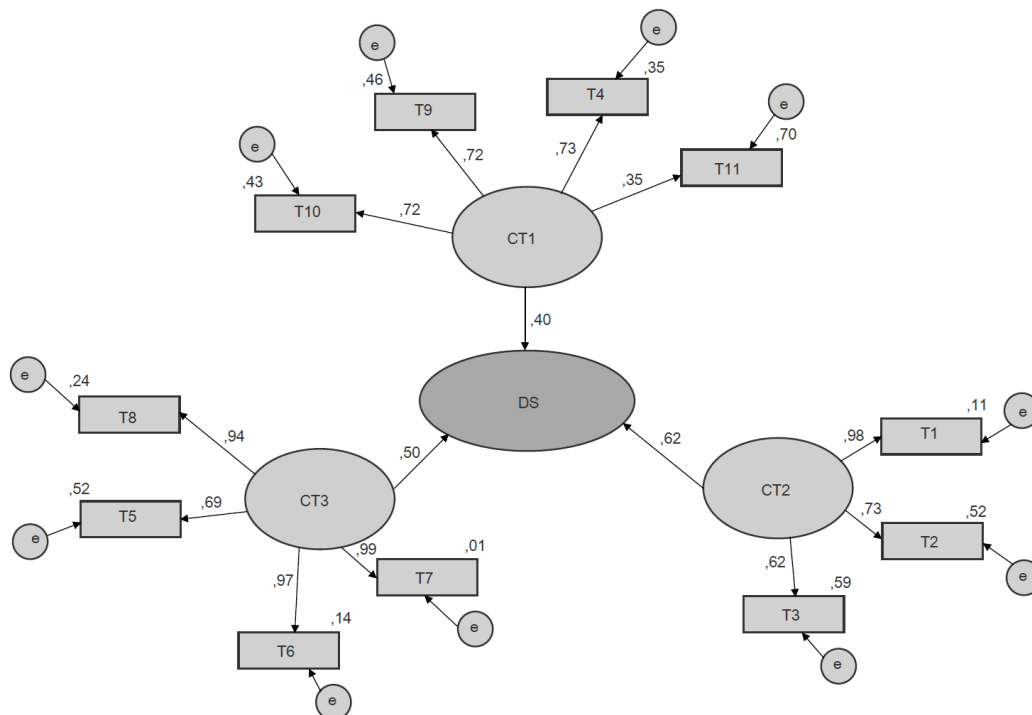(verte).
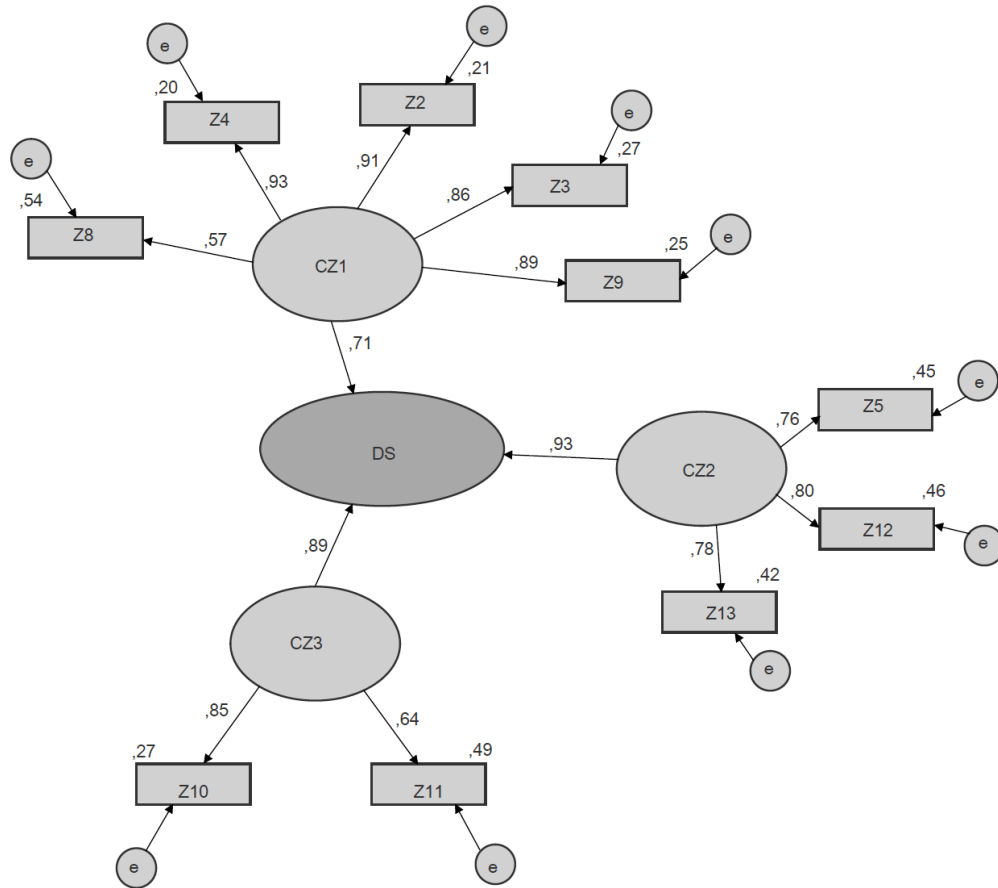
Diagram 3. Model of managerial factors on the efficacy of the promotion strategy
Source: Own research.

In MODEL 4, which refers to the impact of competency potential strategic factors of promotion strategy efficacy - competency factors - on the efficacy of the promotion strategy, presented in Diagram 4, factors CK1, CK2, CK3 were included as latent exogenous variables.

Based on the results of the study, we ought to assume that the **strategic determinants of promotion strategy efficacy**, i.e. the factors having the most significant positive effect on the efficacy of the promotion strategy, in the area of competency factors are:

CK1 – High competencies of the management with respect to technology and organization's knowledge management explained by the variables: Knowledge and technological competencies of company management; High qualifications of the management staff; Organization knowledge management (knowledge banks, knowledge portals); Good insight into the market and behavior of competitors; Acquisition of *know how*-type knowledge

CK2 – Use of modern systems of employee knowledge exchange and use of motivation factors explained by the following variables: Managing a portal to allow knowledge exchange between cooperating employees of the

organization; A system of incentives and financial support for employees furthering their qualifications (courses, training, postgraduate studies); Employee participation in academic symposia and conferences.

CK3 – Employee specialist knowledge and experience described by the following variables: High technological competencies of employees; High employee skills in the area of marketing.
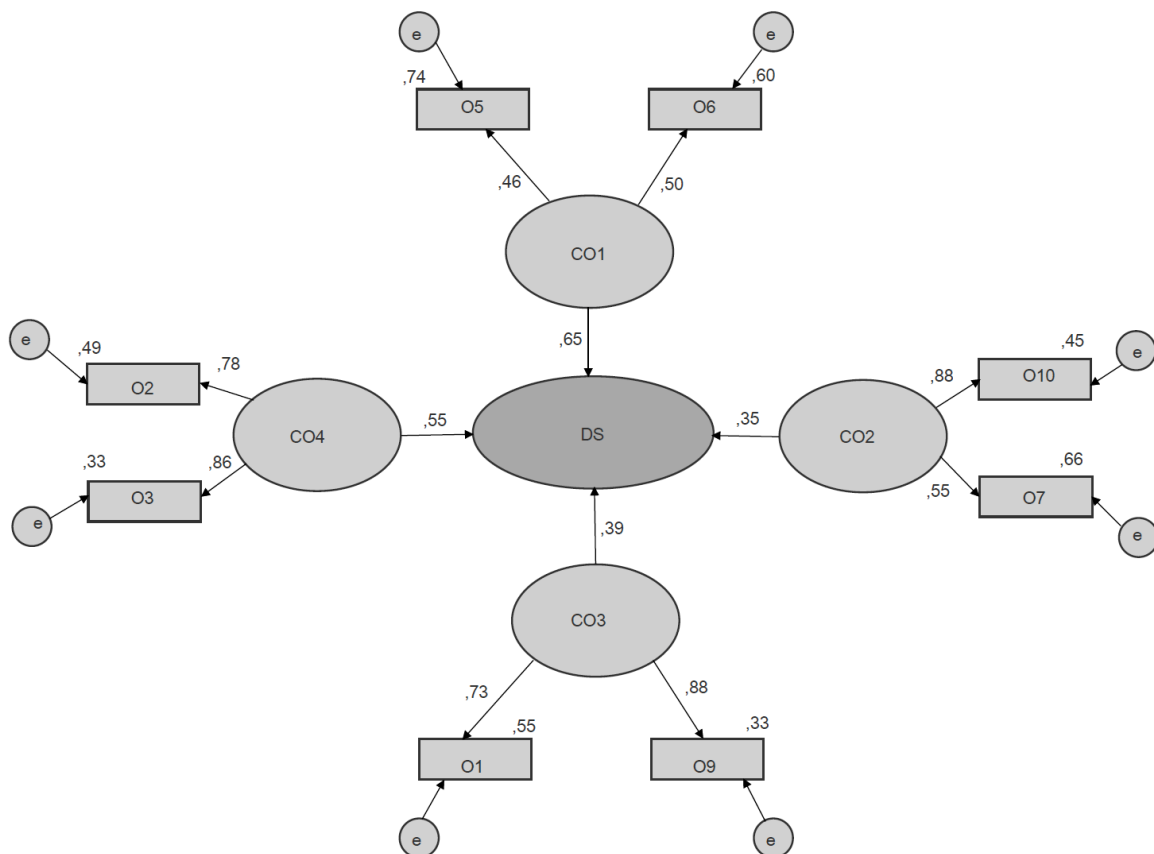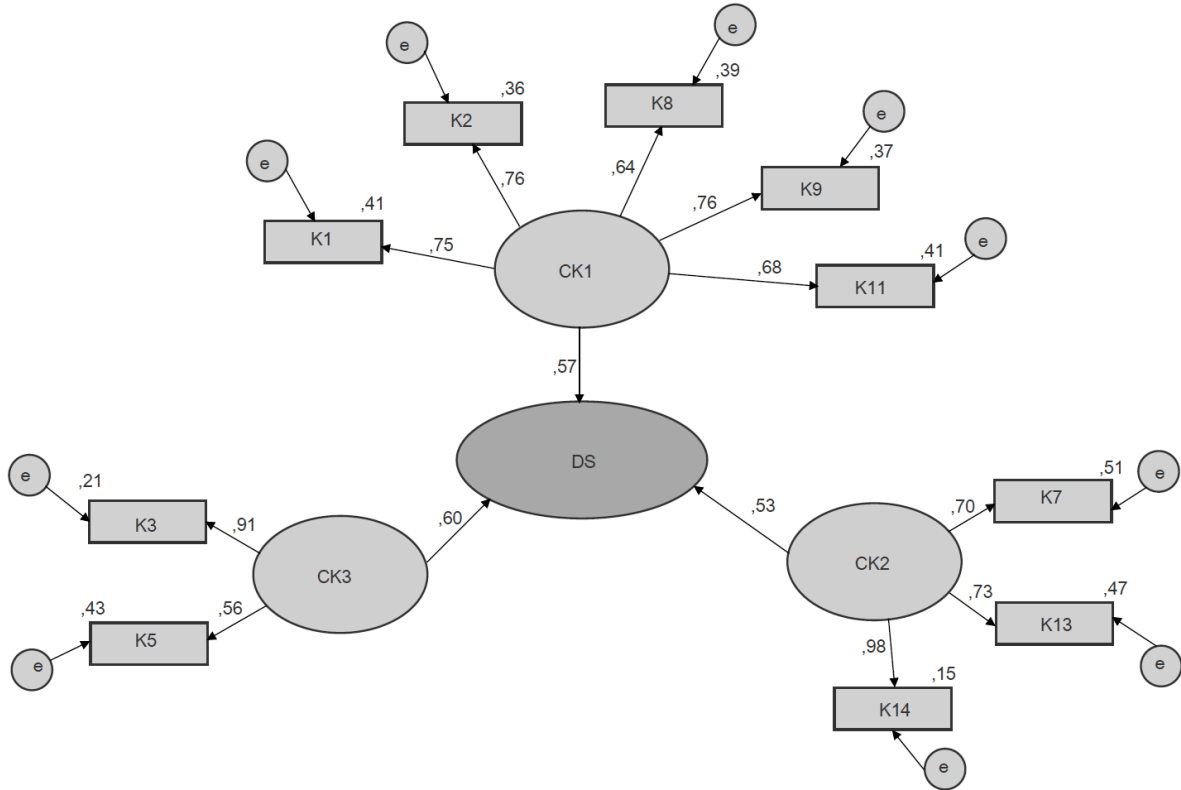

Diagram 4. Model of competency factors on the efficacy of the promotion strategy
Source: Own research.

In MODEL 5, which refers to the impact of potential strategic factors of promotion strategy efficacy - factors related to inter-organizational ties - on the efficacy of the promotion strategy, presented in Diagram 5, factors CP1, CP2 were included as latent exogenous variables.

On the basis of the study results, we need to assume that the **strategic determinants of promotion strategy efficacy**, i.e. the factors having the most significant positive effect on the efficacy of the promotion strategy, in the area of factors related to inter-organizational ties are:

CP1 – Inter-relations among territorial and industry units described by the following variables: Ties under provincial administration; Ties under the special economic zone; Informal ties - friendships with other company leaders; Economic chamber, professional association membership

CP2 - Informal ties with academic staff: Informal ties with academic staff; Informal ties - close links to the end-user.
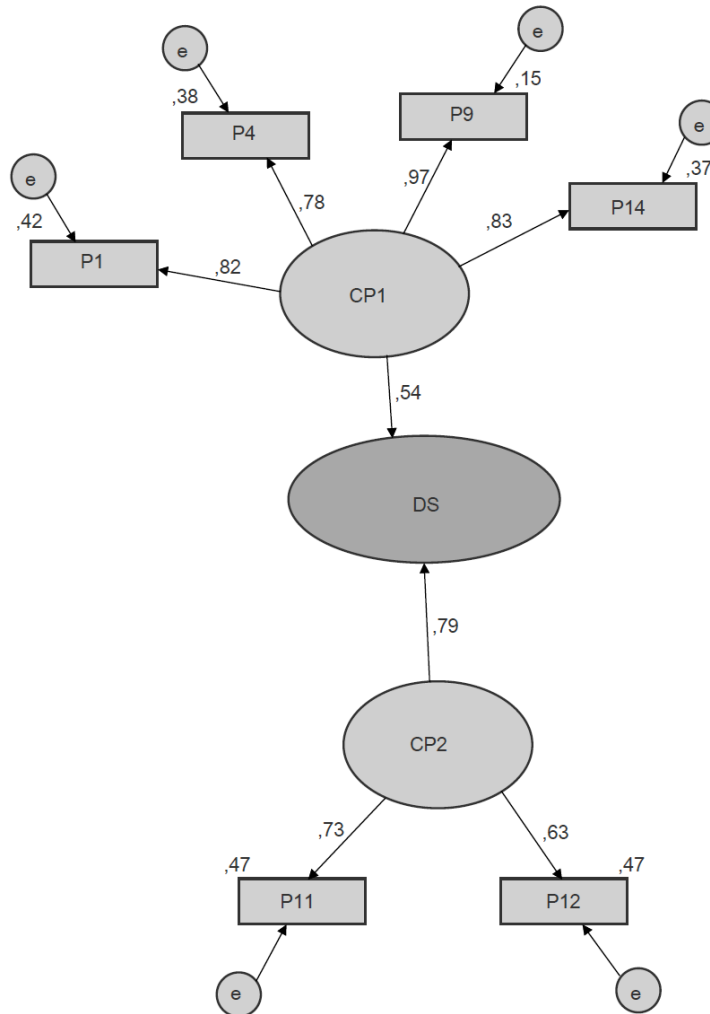
Diagram 5. Model of iter-organizational factors on the efficacy of the promotion strategy
Source: Own research

Summary of the research results and recommendations for the future

The results of own empirical research presented in the study allow one to adopt the author's promotion strategy models in the management of region's image. The presented models, on the one hand, considers the selected strategic determinants of efficacy of the implemented promotion strategy, and on the other hand, identifie

consecutive stages of the process of region's image management. As depicted by the models presented in diagrams, the strategic determinants of efficacy of the strategy of promotion pursued by territorial units of the Warmińsko-Mazurskie Province are:

- High level of organizational culture based on efficient communication system (CO1),
- Transparency of the rules of operation based on team-building (CO4),
- Research & development activity (CT2),
- Own personnel resources and technical infrastructure and own budget for promotion activities (CT3),
- Openness to an innovative approach to promotional campaign management (CZ1),
- Management that is stable and has a positive attitude to modern tool application (CZ2),
- Management that has leadership competencies with respect to promotion strategy implementation (CZ3),
- High competencies of the management with respect to technology and organization's knowledge management (CK1),
- Use of modern systems of employee knowledge exchange and use of motivation factors (CK2),
- Employee specialist knowledge and experience (CK3),
- Inter-relations among territorial and industry units (CP1),
- Informal ties with academic staff (CP2).

OF the above specified twelve identified strategic determinants of promotion strategy efficacy, we may further distinguish five determinants with the strongest impact on the effectiveness of the implemented strategy of promotion. In the process of data analysis, five determinants - the strongest elements of the structural equation models - were singled out.
They include the following:

- High level of organizational culture based on efficient communication system (CO1),
- Research & development activity (CT2),
- Management that is stable and has a positive attitude to modern tool application (CZ2),
- Employee specialist knowledge and experience (CK3),
- Informal ties with academic staff (CP2).

The identification of strategic determinants of promotion strategy efficacy in companies is crucial not only from the theoretical but also practical point of view, for it allows formulation of concrete guidelines for managers interested in changing company image and managing region's image with the use of promotion strategies. The empirical research conducted proved that the above listed strategic determinants are an aspect of utmost importance in the application of region's strategy of promotion.

The conceptual model design - the model underlying the research model - was based on identified strategic determinants of the implemented promotion strategy in the Region of Warmia and Mazury. Strategic determinants are understood to be the vital internal factors having a positive impact on the degree of implementation of the strategy of promotion in the aspect of region's image management and the efficiency of the phenomenon.

Conclusions

One of the elements of marketing mix in territorial terms is promotion, which is an instrument used to create the image. A large part of promotional activities used by territorial marketing entities, aimed at improving the image of territorial units, can be classified as ill-considered and ineffective as well as having no intended effects.

Despite everything, the dynamic development of marketing activities carried out by local governments has been observed for several years, which in this way want to attract various target groups to their cities and regions.

Promotional campaigns, which we are both witnesses and recipients no longer surprise anyone. Territorial units have adopted an active attitude in building the image of their own brands.

Well thought-out strategic activities in the field of self-government promotion are increasingly encountered. Advertising in the media, visual identification systems and the organization of promotional events in various types of cities are becoming everyday life. Some of them have even become the heroes or background of feature films and series, thus becoming iconic places where many groups of tourists, potential residents or investors want to come to.

The inspiration to take up the subject of managing the image of the Warmia and Mazury region were both cognitive considerations and the lack of proposals for systemic solutions for comprehensive promotional activities in the administrative structure of provinces so far, which makes it possible to give the article an application character.

Analysis, research and explications performed as part of the study focused on the promotion strategy model in the management of the Warmia and Mazury region's image. The research material collected allowed, following an application of selected research methods, to achieve the majority of the research objectives.

This publication is a response to the local authorities' demand for a novel academic solution of the issue of promotion strategy model development. The research carried out herein is of a multi-disciplinary nature. The application of a process and systemic approach to the development of the model of the strategy of region's image management necessitates the use of the current achievements of administration, management and marketing sciences.

Moreover, the demonstrated method has a general character, which makes it applicable also to units other than those studies, above all, to NUTS2 level units in other regions. The presented overview of the range of issues in the analyzed field does not exhaust all crucial matters.

The research allowed to determine the strategic factors of the promotion strategy used by the Warmińsko-Mazurskie Province. The effectiveness of promotional activities conducted by self-government units of the Warmia and Mazury region has been previously tested on a group of tourists. The long-term Masuria Miracle of Nature campaign was described as highly effective. By. The models of promotion strategies presented in the course of research have a key role here, as well as formal and informal connections with business partners and all aspects of such cooperation. This is confirmed by other studies of science representatives, which say that under economic conditions, one of the most strategically effective and realistic ways is to consolidate small creative, innovation-focused enterprises around integrated establishments, which should involve the provision of statutory support for these concentration processes and proper coordination on the part of public authorities (Ignatavičius et al. 2015; Tvaronavičienė, Černevičiūtė, 2015; Valter 2016; Tvaronavičienė, 2017; Razminienė, Tvaronavičienė 2017; Monni et al., 2017; Goncharenko et al., 2019; Petrenko et al., 2019).

Therefore, the author intends to pursue the analysis of the studied issue as part of other individual research works.

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DETERMINANTS OF THE DEVELOPMENT OF ENTERPRISES' INNOVATIVENESS IN THE ASPECT OF COMPETITIVENESS OF THE ECONOMY[*]

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Abstract. The article presents determinants pertaining to the development of enterprise innovativeness in the aspect of competitiveness of the economy. This article presents definitions, and following on from there, the research indicates the results of performed investments depending on the type of implemented innovation: product innovations, process innovations, or non-technological innovations. In assessing the innovativeness of the surveyed companies, I took into account the following: instruments of competitiveness; the new products or services implementation, the improvement of the product and services' quality, improvement in customer relations; potential for innovation: increased productivity or production capacity, modern methods of production and services, cost reductions, improved work flows, innovations in management; effects: higher numbers of customers, an augmentation in market share, better brand awareness, extended market coverage, higher profitability of production and services, revenue growth, higher net profit. The work involves statistical analysis on the reliance between features. It proposes the hypothesis about the independence of these same features. Person's chi-squared test and Fisher's exact test for all mentioned issues were carried out. The one synthetic feature was created and the Wilcoxon rank – sum test (Mann – Whitney U test) was performed.

Keywords: EU funds; innovativeness; competitiveness; enterprises

1. Introduction

In 1934, J. Schumpeter, an Austrian economist, conceptualized the notion of innovation in the wider economic sense. He emphasized that innovation allows a company to keeping a high position on the market. According to Schumpeter, a nurturing of innovation results in the following situations: an emergence of a new product on the market, making a decision about introducing the new methods in production, creating new markets for the products, using new sources of raw materials, supporting sales processes with uncharted formulas, creating new structure in the company organization (Croitoru, 2012).

In the opinion of P. F. Drucker, innovation is an action that permeates all realms of a company's activity. An innovation can apply to products, marketing; likewise actions involving improvement in the methods of a company's management processes. Drucker perceives innovation in system-wide operations as consisting of the active identification of changes that take place in an organisation, and also using those operations in the process of creating further innovations (Drucker 1998). P. Kotler, an American theoretician of marketing, defines innovation as something perceived in the category of novelty (Kotler 1999). According to J. Tidd, innovation is a process of changes when opportunities are remoulded in new ideas; and further on they are used in practice (Tidd, Bessant 2009). P. Hildreth and C. Kimble perceive innovation as the effect of exchanges between different areas of knowledge; and later on, as the integration of knowledge in a completely new and different way. As a result of such integration, new products are produced as well as services, not to mention processes in the organization (Hildreth, Kimble 2004).

The Oslo Manual concerns the methods of collecting and interpreting indexes related to innovation. The manual perceives innovation as the implementation of completely new or relevantly changed products; as well as the processes and solutions connected to management and the organizing of a company. Innovative processes are connected to academic, research, technical, financial or trading activities. Those activities aim to develop and implement innovations to common use. According to the authors of the Manual, in an economic sense, innovation is the ability of an economic entity to do systematic research, use their results in practice and also the ability to practise published academic research, research-and-development works, inventions and patents.

The definition of innovation underlines the fact that that essence of innovation is production and realization of a new product, alternatively application of a new process during manufacturing already known products (OECD 2005).

Another definition perceives innovation as the final stage of creating a new material reality; or simply the implementation of new ideas (Bogdanienko et al. 2004; Prodani et al. 2019; Orynbassarova et al. 2019).

The last mentioned definition places an emphasis on innovation as a process and considers it as those actions which lead to the creation, development and introduction of new values (Niedzielski, Rychlik 2006).
Using the quoted definitions we can delineate most important features of innovation.

They are:
- innovation is interactive and multidisciplinary;
- it is one of the most important integrated processes in the enterprise,it outstands by novelty and uniqueness,
- it forces employees of an organization to continuously learn,
- it has the attributes of social phenomenon,
- it can be perceived as the forerunner of changes in the company (creative destruction),
- it brings the risk of expending high costs,
- it has features typical for processes (Niedzielski, Rychlik 2006).

There are many criteria that are used to classify innovation. The most important are: the introduction of a new product, process or service, applying changes in the organisation, range of changes, steadiness of the process of changes, uniqueness, novelty and range of influence, a range of induced effects, and a degree of complexity.

2. Innovativeness and Economy Growth

Technology as a product of innovative activities cannot be the reason for rivalry between economic entities (non-rivalry of ideas). So it is a source of growing incomes. In the macroeconomic scale, in order to for the non-rivalry of ideas could be translated into long-term dynamic of economic growth, it is necessarily that reliance between general expenditures on research-and-development in economy and the tempo of the technological progress is enough strong.

According to Schumpeter's model of growth, in which the pace of long-term growth in developed countries is proportional to the intensity of research-and-development activities, measured by a percentage of expenses on innovative activities in GDP, alternatively by percentage of employees in research and the development sector. In consequence, according to that kind of model it translates into the dynamic of GDP per capita. From the perspective of the company, the non-rivalry of ideas means that the first inducement to start innovative activity is the possibility of obtaining additional revenues in the future.

The most popular means for saving innovator rent is intellectual property protection (IPP). According to recent literature the reliance between the strength of IPP and the innovativeness of economies has the shape of the diverted curve U. This means that too strict or to weak protection reduces innovative activity; the most beneficial is a moderate level of intellectual property protection (Narodowy Bank Polski, 2016).

The growth of productivity in countries which go through real convergence, like Poland, usually depends in small degree on expenditures on research-and-development. In this case, much more important are innovations from abroad (diffusion of innovations). Diffusion of innovations is necessary for economic growth in less developed economies.

The factors favouring the diffusion of innovations can be analyzed on the company or state levels. In the first instance, the conditions which effect the tempo of diffusion of innovations are: innovations' prevalence over old solutions, experience of potential clients, simplicity of innovations, possibility to test new solutions and success of the companies which implemented innovation earlier (Narodowy Bank Polski, 2016).

Direct foreign investment can be an important source of growth and restructuring of economy via knowledge, technology and innovations diffusion. The ability to gain benefits from direct foreign investment does not depends on just macroeconomic environment but also on the characteristic of the company based on material and intangible resources (Gammeltoft, Kokko 2013; Tvaronavičienė 2019; Zeibote et al. 2019; Baltgailis 2019).

3. The factors, which determine the development of innovativeness of companies

There are many factors which determine the development of companies' innovativeness. According to one of the classification they are as follow:
- resources of academic and technical knowledge; research-and-development abilities in the organisation (decide about bases of innovative activity, they are the important source of innovation),
- innovativeness policy preferred by the organisation (sets out the directions of innovativeness, and decides about spendings on research and development),

- structure of the state economy (it influences the innovative mechanisms and determines how much the economy depends on technical achievements),
- system in which the economy operates (determines the specification of innovative mechanism as well as its effectiveness),
- psychological and cultural factors (they condition the presence of prestige and ambition as the motives for introducing innovation) (Szopik-Depczyńska 2009).
-

The idea that innovations in a company depend on external factors (exogenous) and also internal factors (endogenous) has a lot of supporters in the literature concerning management. The external factors are created outside of the company but latter are formed by the organization.

According to M. Kolarz, the most important external factors of enterprise's innovativeness are:
- conducting research-and-development works outside of the company,
- realization mutual research-and-development works with close external entities,
- deputing specific research-and-development works to external entities,
- sending employees for internship or practice outside of the company,
- employment of outside workers,
- exchanging technical knowledge and experience with other companies,
- processes of contracting out production,
- co-production – taking collaborative production tasks,
- building complete facilities outside of the company,
- services for the outside entities; but also accepting services from outside (management contract, franchising),
- export and import of licenses,
- international trade,
- creating venture companies and overseas investment (Kolarz 2006).

There are factors conditioning innovativeness in a company, like:
- all kinds of service processes like academic research, technical and scientific information and also economic and management information,
- social and political state situation,
- law standards and administrative warrants,
- general market conditions (market mechanisms, economic calculations, prices),
- systematic education about innovativeness in the economy,
- conducting trainings about innovativeness in the economy,
- market and outside market interactions between partners who are a source of information and technology (strategic alliances, possibility to share the research-and-development activities on few entities, less risk and more competitiveness),
- technical infrastructure (particularly important for companies from energy-related sector).

It is easy to note that many of outside factors may indicate state interventionism. We have to mention political situations, and legislative policies; so a *de facto* state policy towards innovativeness. State interventionism should aim to support enterprises of high technology, the takeover of responsibility for the transfer of technology; as well as creating research-and-development works, that also means organizing the research, creating and financing research centers, and supporting companies, which aim to introduce technicolgical and scientific progress. Adequate state policy relevantly determines the progress of innovativeness of companies. This way it also minimizes the risk of destabilization and deterioration of of the economic situation and stimulates high-tech changes in the economy.

The internal factors existing within a company define the company's innovative needs and means that can be used for innovations; human resources in innovative processes and the importance of innovation for the further development of the company.

The one essential condition for the right course of innovative processes in the company is to employ the person responsible for organizing these processes (a coordinator).

The basic variable that is a part of expenditure indices is the amount of expenditure on research-and-development. One of the basic indexes in this group is GERD (Gross Domestic Expenditure on Research and Development), whichis the amount of state spending on research-and-development, presented as a percentage of GDP.

The basic variables, parts of the resultative indices of innovativeness, are selected effects of expenditure on research-and-development, numbers of academic publications, patents applications, patents, and above all the number of innovative products. The countries, which bear high costs of research-and-development activity are able to create new knowledge and invent patents and implement innovations (Nowak 2012).

„Technological product and process (TPP) innovations comprise technologically implemented new products and processes; and lead to significant technological improvements in products and processes. TPP innovation has been implemented if it has been introduced on the market (product innovation) or used within a production process (process innovation). TPP innovations involve a series of scientific, technological, organisational, financial and commercial activities. A TPP innovating firm is one that has implemented technologically new or significantly technologically improved products or processes during the period under review" (OECD 2005).

Nowadays, the definition proposed by OECD is commonly used; it distinguishes the kinds of innovations implemented by enterprises. It is named the Oslo Methodology, which determines innovation as the application of completely new or significantly improved goods or services, processes, marketing and organizational methods.
This definition figures out the following types of innovations:
- product innovations – those implement the product or service on the market, which are new or significantly improved in matters of their features or purposes,
- process innovations – implementation of new or considerably improved method of production or delivery,
- organizational innovations – implementation of new methods of management in the company, that concern the changes in organizing work places or relations with surroundings,
- marketing innovations – implementation of the new marketing method concerning significant changes in project/construction of product, packaging, distribution, promotion or price strategy (OECD 2005).

4. The Results of Research

In the process of implementation and researching the investments financed from EU funds the following definitions were used:
1. Product innovations – implementation of the products or services, which are new or significantly improved on the market.
2. Process innovations – implementation of new or considerably improved methods of production or systems of delivery products.
3. Non-technological innovations – mainly organizational and management innovations like: implementation of the advanced management technics (e.g. Total Quality Management), introduction of improved organizational structures, and implementation of new or significantly changed strategy of the company. Besides we can also consider essential change in marketing concept or strategy of the company.

In 2018, I conducted my own research in Poland, where 210 small and medium enterprises were examined for in terms of their use of UE funds for new investments. In the research I tried to check if the enterprises implemented innovations (product, process or non-technological).

In assessing innovativeness of the surveyed companies, I took into account:
-instruments of competitiveness: the new products or services implementation, the improvement of the products' and services' quality, the improvement in relations with the customers,
-potential for innovativeness: increased productivity or production capacity, modern methods of production and services, cost reduction, better organization of work, innovations in the management processes,
-effects: higher number of customers, the augmentation in market share, better brand awareness, extended market coverage, higher profitability of production and services, revenue growth, higher net profit.
A statistical analysis of dependences between the features was performed. In order to test if there is statistical reliance between the responses and intances of innovation I used Pearson's chi – squared test and Fisher's exact test.

Two types of variables were created for answers to questions:
pi_3 - nominal variable with 3 variants with values: 1 for "no" answers, 2 for "difficult to say", 3 for "yes",
pi_2 - nominal variable with 2 variants with values: 0 for "no" and "difficult to say", 1 for "yes",
Hypotheses Pearson's chi-squared test and Fisher's exact test in the tests are:
H0: features are independent
H1: features are not independent
The obtained p-value <0.05 indicates the rejection of H0.

Fisher's exact test is recommended when there are not many categories. Its results coincide in most cases with the results of the Pearson's chi-squared test.
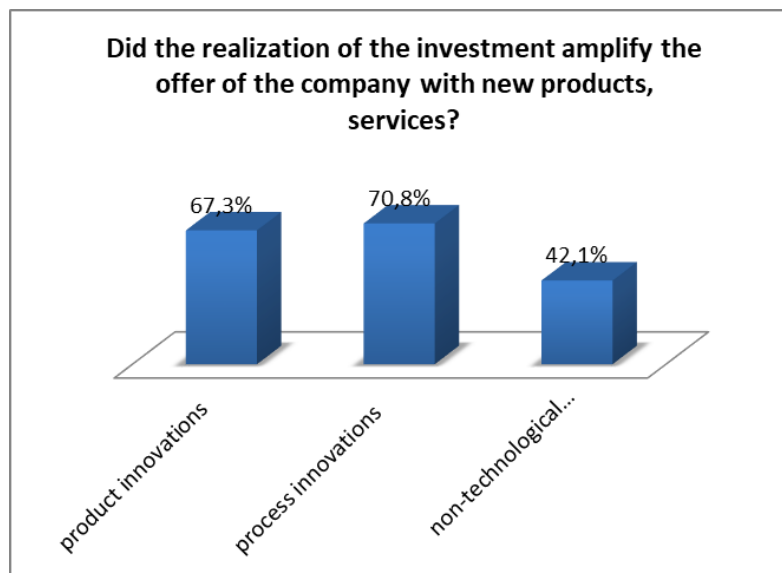
Fig. 1. Influence of investments on the introduction of new products or services
Source: own research

Companies by introducing product or process innovations achieved the effect of an innovative or modernized product offer (product innovations 67,3% and process innovations 70,8%). 42% of non-technological innovations extended their product offer (see Figure 1).

The performed statistical tests Pearson's chi-squared test and Fisher's exact test mostly confirm the independence of tested features. There is no dependence between the answers and the kind of introduced innovation product, innovation process.

Chi-squared test for product innovations

3 variants of the feature product innovations: Pearson chi2(2) = 1.3037; p-value = 0.521; Fisher's exact = 0.552

2 variants of the feature product innovations: Pearson chi2(1) = 0.7811; p-value = 0.3

Fisher's exact = 0.506; 1-sided Fisher's exact = 0.255

Chi-squared test for process innovations

3 variants of feature process innovations: Pearson chi2(2) = 1.0841; p-value = 0.582; Fisher's exact = 0.553 2 variants of the feature process innovations: Pearson chi2(1) = 1.0088; p-value = 0.315; Fisher's exact = 0.379; 1-sided Fisher's exact = 0.218

The dependence occurred with non-technological innovations.

3 variants of the feature non-technological innovations: Pearson chi2(2) = 11.0369; p-value = 0.004; Fisher's exact = 0.006

2 variants of the feature non-technological innovation: Pearson chi2(1) = 8.2882; p-value = 0.004; Fisher's exact = 0.008; 1-sided Fisher's exact = 0.006

Fig. 2. Influence of investments on costs' reduction
Source: own research

Over 50% of examined companies after the realization of process innovations achieved cost reductions. Over 30% of companies, which introduced the product innovations, presented the cost reduction. Only 26% of companies that implemented non-technological innovations reduced the costs (see Figure 2).

The performed statistical tests Pearson's chi-squared test and Fisher's exact test mostly confirm the independence of tested features. There is no dependence between the answers and the kind of introduced innovation product, innovation process, non-technological innovations.

Chi-squared test for product innovations

3 variants of the feature product innovations: Pearson chi2(2) = 0.5784; p-value = 0.749; Fisher's exact = 0.766

2 variants of the feature product innovations: Pearson chi2(1) = 0.5438; p-value= 0.461; Fisher's exact = 0.550; 1-sided Fisher's exact = 0.296

Chi-squared test for process innovations

3 variants of the feature process innovations: Pearson chi2(2) = 3.7995; p-value = 0.150 ; Fisher's exact = 0.149

2 variants of the feature process innovations: Pearson chi2(1) = 3.4901; p-value = 0.062 Fisher's exact = 0.075; 1-sided Fisher's exact = 0.047

3 variants of the feature non-technological innovations: Pearson chi2(2) =   4.3553;
p-value = 0.113; Fisher's exact = 0.122
2 variants of the feature non-technological innovations: Pearson chi2(1) =   2.9577;
p-value = 0.085; Fisher's exact = 0.119; 1-sided Fisher's exact = 0.071

Fig. 3. Impact of investments on profitability
Source: own research

The performed statistical tests: Pearson's chi-squared test and Fisher's exact test mostly confirm the independence of tested features. There is no dependence between the answers and the kind of introduced innovation product, innovation process (see Figure 3).
Chi-squared test for product innovations
3 variants of feature product innovations: Pearson chi2(2) = 0.4470; p-value = 0.800;
Fisher's exact = 0.825
2 variants of feature product innovations: Pearson chi2(1) = 0.4446; p-value= 0.505; Fisher's exact = 0.554; 1-sided Fisher's exact = 0.320;
Chi-squared test for process innovations
3 variants of the feature process innovations: Pearson chi2(2) = 2.7897; p-value = 0.248; Fisher's exact = 0.244
2 variants of the feature process innovations : Pearson chi2(1) =   0.0037;   p-value = 0.951;
Fisher's exact = 1.000; 1-sided Fisher's exact = 0.555
The dependence occurred with non-technological innovations.
3 variants of the feature non-technological innovations: Pearson chi2(2) = 9.2587; p-value = 0.010; Fisher's exact = 0.019;
2 variants of the feature non-technological innovation: Pearson chi2(1) = 1.4814; p-value = 0.224, Fisher's exact = 0.301; 1-sided Fisher's exact = 0.169;
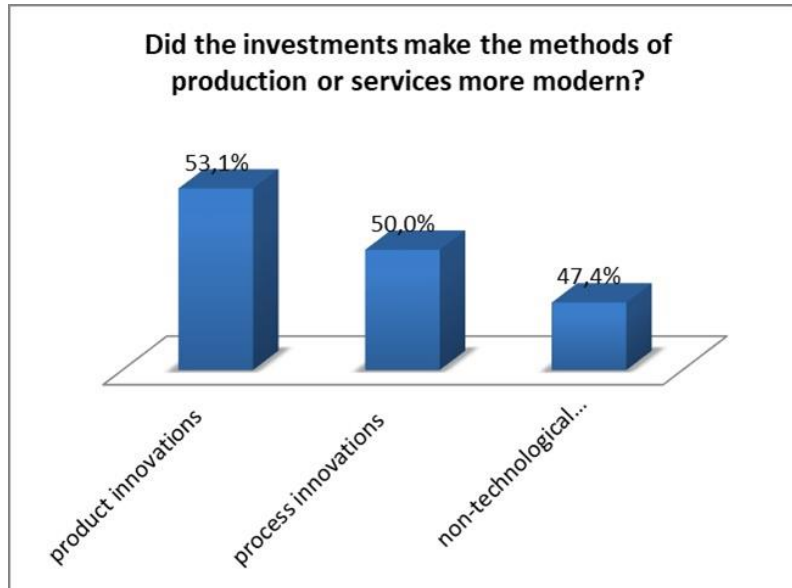
Fig. 4. Impact of investments on methods of production or services
Source: own research

The performed statistical tests: Pearson's chi-squared test and Fisher's exact test, mostly confirm the independence of tested features. There is no dependence between the answers and the kinds of introduced innovation product, innovation process, and non-technological innovations (see Figure 4).
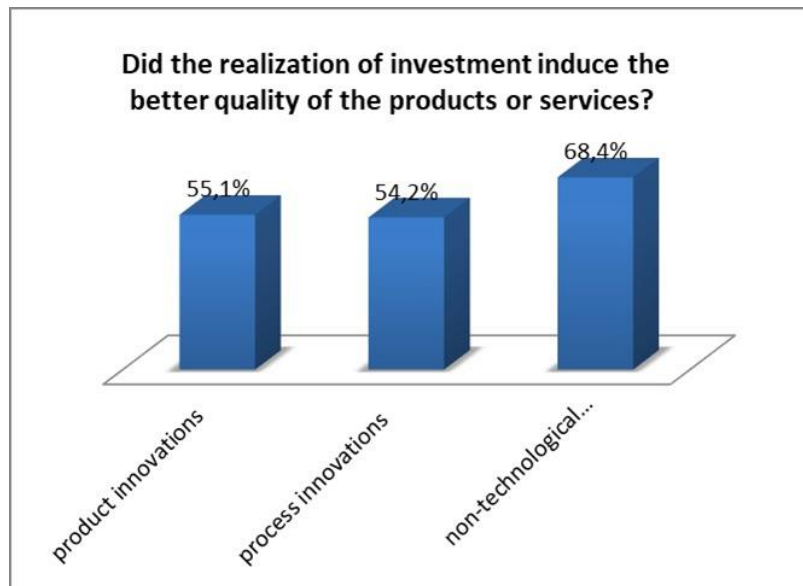
Fig. 5. Impact of investments on the quality of products or services
Source: own research

The performed statistical tests: Pearson's chi-squared test and Fisher's exact test, mostly confirm the independence of tested features. There is no dependence between the answers and the kind of introduced innovation product, innovation process or non-technological innovations (see Figure 5).
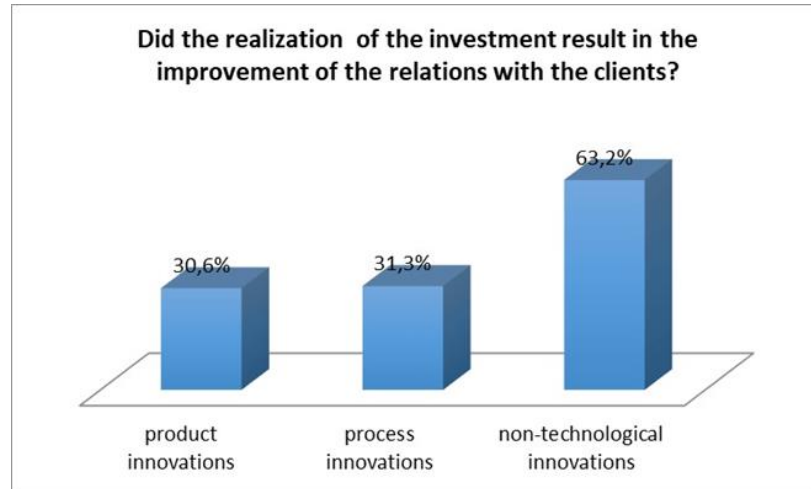
Fig. 6. Influence of investment on customers relations' improvement
Source: own research

The performed statistical tests: Pearson's chi-squared test and Fisher's exact test, mostly confirm the independence of tested features. There is no dependence between the answers and the kind of introduced innovation product or innovation process (see Figure 6 amd Figure 7).

Chi-squared test for product innovations

3 variants of the feature product innovations: Pearson $chi2(2) = 1.8117$; p-value = 0.404; Fisher's exact = 0.371;

2 variants of the feature product innovations: Pearson $chi2(1) = 0.6326$; p-value = 0.42; Fisher's exact = 0.541; 1-sided Fisher's exact = 0.278;

Chi-squared test for process innovations

3 variants of the feature process innovations: Pearson $chi2(2) = 3.5944$; p-value= 0.166; Fisher's exact = 0.193;

2 variants of the feature process innovations: Pearson $chi2(1) = 0.9080$; p-value= 0.341; Fisher's exact = 0.418; 1-sided Fisher's exact = 0.227;

The dependence occurred with non-technological innovations.

3 variants of the feature non-technological innovations: Pearson $chi2(2) = 7.2936$; p-value = 0.026; Fisher's exact = 0.020;

2 variants of the feature non-technological innovation: Pearson $chi2(1) = 6.7652$; Pr = 0.009; Fisher's exact = 0.015; 1-sided Fisher's exact = 0.010;
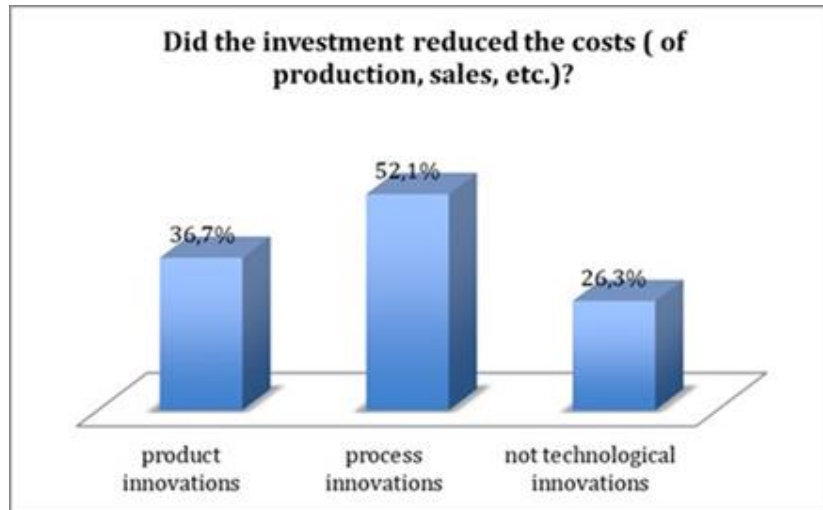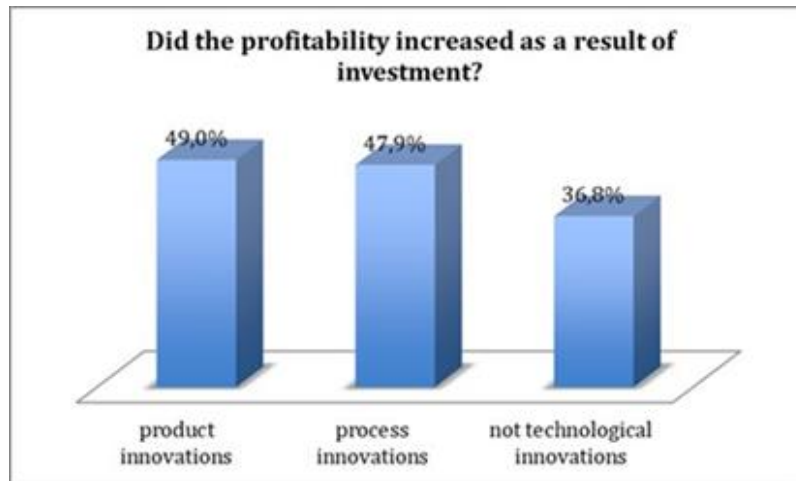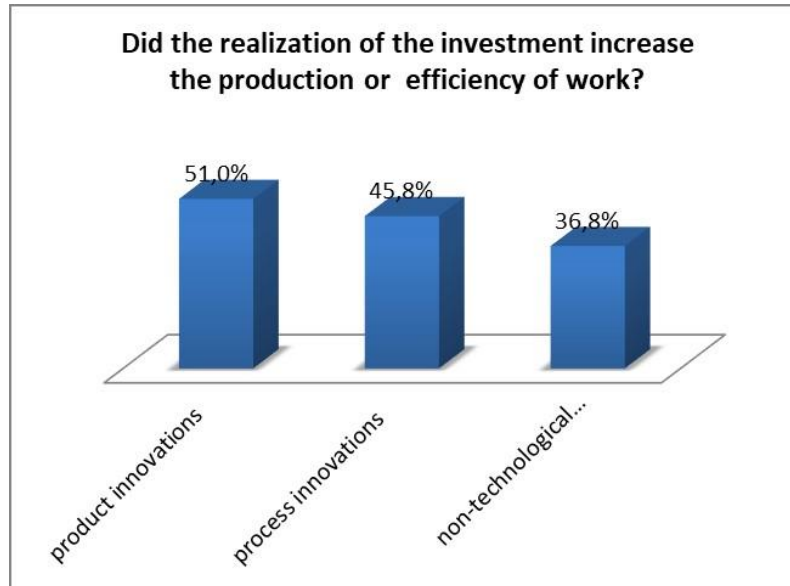
Fig. 7. Impact of investments on increase of production or work efficiency
Source: own research

The performed statistical tests: Pearson's chi-squared test and Fisher's exact test, mostly confirm the independence of tested features. There is no dependence between the answers and the kind of introduced innovation product orinnovation process.

Chi-squared test for product innovations

3 variants of the feature product innovations: Pearson chi2(2) = 1.2763; p-value= 0.528; Fisher's exact = 0.518;

2 variants of the feature product innovations: Pearson chi2(1) = 1.1349; p-value= 0.287; Fisher's exact = 0.323; 1-sided Fisher's exact = 0.193;

Chi-squared test for process innovations

3 variants of the feature process innovations: Pearson chi2(2) = 2.7507; p-value = 0.253; Fisher's exact = 0.257;

2 variants of the feature process innovations: Pearson chi2(1) = 0.1130; p-value = 0.737;

Fisher's exact = 0.843; 1-sided Fisher's exact = 0.445;

The dependence occurred with non-technological innovations.

3 variants of the feature non-technological innovations: Pearson chi2(2) = 6.3325; p-value= 0.042; Fisher's exact = 0.061
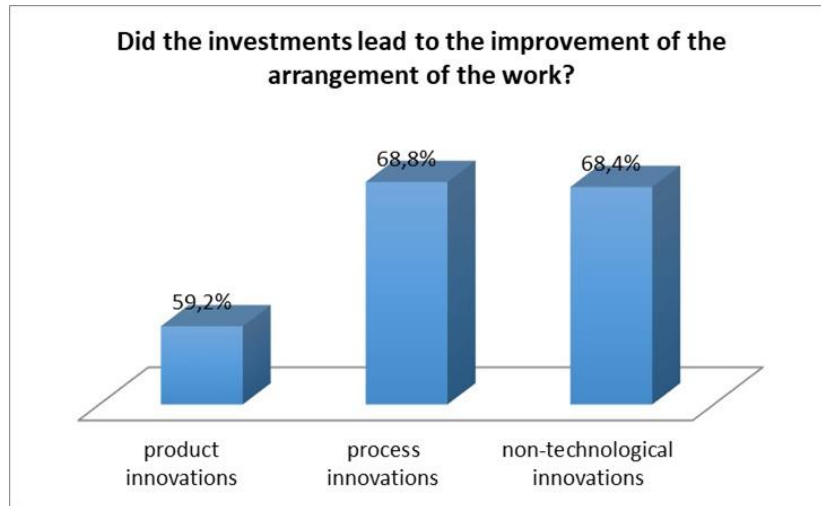
Fig.8. Impact of investments on better organization of work
Source: own research

The best results in the improvement of work flow– over 68% of the companies were achieved by introducing process innovations and non-technological innovations (see Figure 8).

The performed statistical tests: Pearson's chi-squared test and Fisher's exact test, mostly confirm the independence of tested features. There is no dependence between the answers and the kind of introduced innovation product, innovation process, or non-technological innovations.
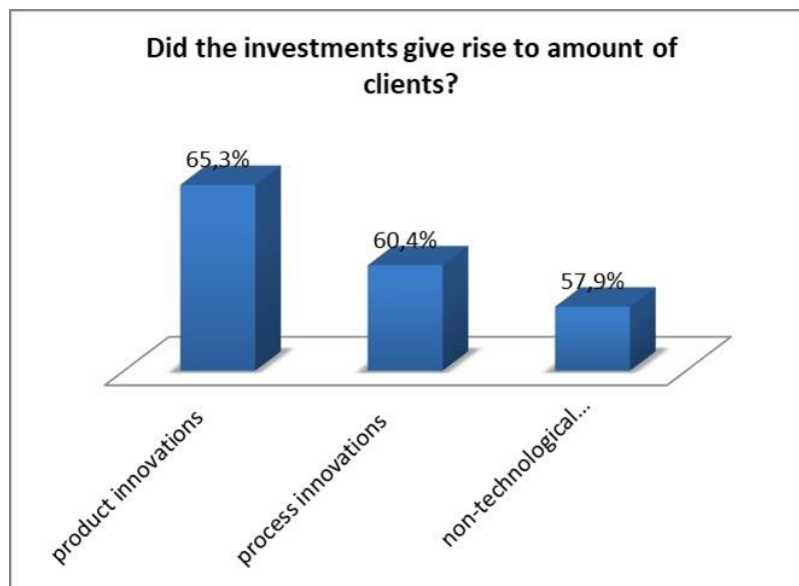
Fig.9. Impact of investments on increase in the number of customers
Source: own research

1290

The companies, which introduced product innovations performed in 65% cases increased the number clients, for process or non –technological innovations the result was achived by 60% or less cases (see Figure 9).

The performed statistical tests Pearson's chi-squared test and Fisher's exact test mostly confirm the independence of tested features. There is no dependence between the answers and the kind of introduced innovation product, innovation process, or non-technological innovations.
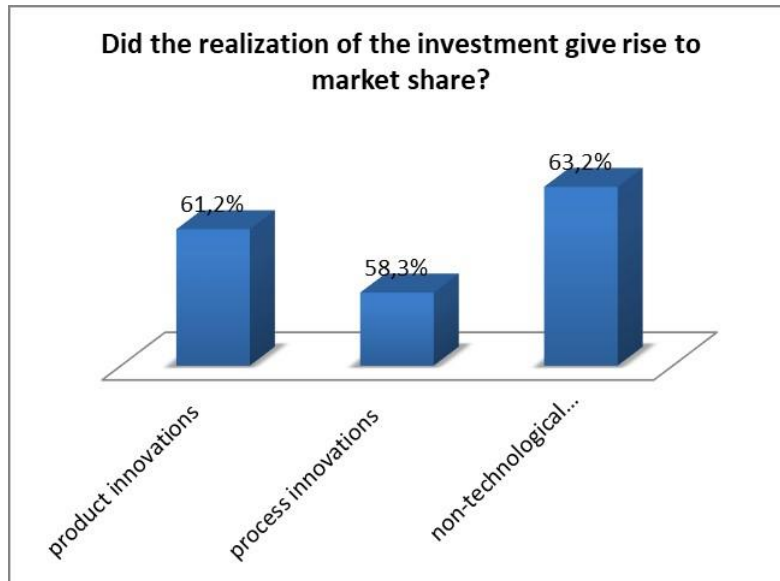
Fig.10. Impact of investments on market share
Source: own research

In the companies, where the non-technological innovations were introduced, the investment gave the rise to market share in 63% of surveyed cases, for product innovations over 60% of the enterprises. The performed statistical tests Pearson's chi-squared test and Fisher's exact test mostly confirm the independence of tested features. There is no dependence between the answers and the kind of introduced innovation product, innovation process, or non-technological innovations (see Figure 10).
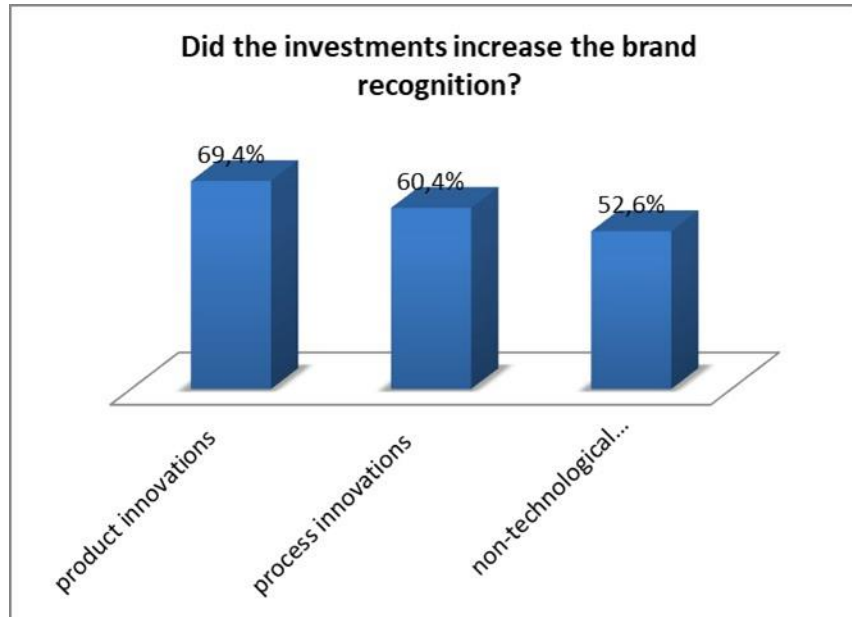
Fig. 11. Impact of investments on brand recognition
Source: own research

Brand recognition increased in nearly 70% of the companies, which introduced product innovations. The performed statistical tests Pearson's chi-squared test and Fisher's exact test mostly confirm the independence of tested features. There is no dependence between the answers and the kind of introduced innovation product, innovation process or non-technological innovations (see Figure 11).
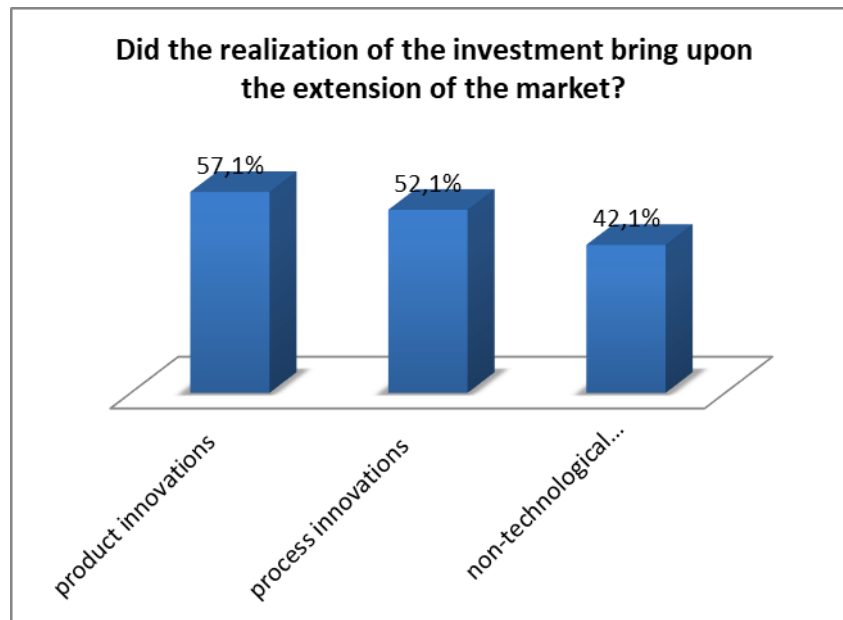
Fig. 12. Impact of investment on market expansion
Source: own research

The realization of product innovation investment increased market share in 57% of cases. The performed statistical tests: Pearson's chi-squared test and Fisher's exact test, mostly confirm the independence of the tested features. There is no dependence between the answers and the kind of introduced innovation product, innovation process, or non-technological innovations (see Figure 12).

Wilcoxon rank-sum test:

The one synthetic feature was created to present the level of the company's satisfaction from the introduced innovation. The feature was created on the basis of the answers to 16 questions.

The Wilcoxon rank-sum test verifies the hypothesis H0 (two independent samples derive from the population with the same dispersion).

Conclusions

The research presented here shows that as a result of introducing innovations, particularly product and process innovations, companies modernised methods of the production which caused reduction of the costs and the companies achieved higher profitability of production or services.

Flexible, modern technologies enable to prepare diversified products offer adjusted to needs and expectations of clients. The companies expanded their offers of products or services and at the same time the high quality of their products was provided.

The research presented here shows that the introduced non-technological innovations influenced relations with clients and better workflow much more than product and process innovations.

The investments in the companies, regardless of these kinds of innovations: product, process or non-technological, influenced many instruments of competitiveness.

The companies presented here displayed better methods of production, higher quality of services, better management of work and the same reduction of costs.

With regard to the introduced innovations, the companies noted an increase in the number of clients, an increase in market share and reinforcement of the brand. The financial result indicated by more than half of the amount of companies was increase of sales incomes and net profit.

The performed statistical tests Pearson's chi-squared test and Fisher's exact test mostly confirm the independence of the tested features. There is no dependence between the answers and the kind of introduced innovation (product, process or non-technological). In a number of cases, dependence occurred with non-technological innovations.

The one synthetic feature was created to present the level of the company's satisfaction from introduced innovation. The feature was created on the basis of answers to 16 questions. Wilcoxon rank-sum test verifies the hypothesis H0 (two independent samples derive from the population with the same dispersion). H0 indicates a similar dispersion for the synthetic variable presenting the level of company satisfaction pertaining to to the introduced innovation. There is no argument for denying H0 in all kinds of innovations (product, process and non-technological). Therefore there is no dependence between a general level of satisfaction (represented by synthetic variable) and the fact of introducing a specific kind of innovation.

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Aknowledgements

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STRATEGIC MANAGEMENT OF INNOVATION DEVELOPMENT: INSIGHTS INTO A ROLE OF ECONOMIC POLICY

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Abstract. This article justifies the necessity and inevitability of the innovative development of the Russian economy in the transition to a new technological paradigm. The authors substantiate the determining influence of the innovation potential in Russia's GDP growth against the background of the insolvency of other factors – labor, capital – in giving a powerful impetus to economic growth and development. The paper presents the results of comparative analysis of labor productivity in Russia and in the most economically developed countries. The authors conclude that Russia has the greatest growth potential in the field of scientific research and development. Prognostic values of GDP growth are analyzed in three scenarios – basic, optimistic, and ambitious. The study reveals the key success factors and possible barriers to the creation and development of innovations, providing convincing evidence of their influence on the companies' efficiency. Moreover, the paper provides an expanded understanding of the modern innovation tools and stresses the critical importance of their correct choice in solving strategic tasks of the company's innovative development. The authors analyze the role of strategic target-setting in the scale and speed of innovative development of Russian industry. They stress the urgency of Russia's transition to a new technological paradigm, requiring innovative and technological renewal of the entire economic landscape, making the economy truly innovative.

Keywords: innovations; innovative development; industry; business; modernization of the economy; GDP; development scenarios; industrial policy; technological paradigm; Russia

1. Introduction

Radical changes in most industries happen under the influence of such global trends as the emergence of breakthrough technologies, digitalization, and acceleration of the product life cycle. The purpose of this work was to conduct a scientific analysis of the state and prospects for the innovative development of Russian industry and to present a new vision of strategic goals to bring Russia to the list of most technologically developed countries. In this case, the assessment of the impact of the innovation potential in Russia's GDP growth and the choice of innovative tools to adapt companies to the new reality deserves special attention. Today, Russia finds itself on the highway of movement towards an innovative economy. However, its path is complicated by the accumulation of negative factors of internal and external genesis. Therefore, the relevance of this study is due to the search for ways out of this unique situation.

2. Literature Review

Modern economic processes are characterized by a high rate of transformation. The use of traditional scientific approaches and management models does not provide an opportunity for economic actors to respond quickly to the challenges of the economic environment, as noted by C.K. Prahalad and G. Hamel G in "Strategy as a field of study: Why search for a new paradigm?" (Prahalad, & Hamel, 1994). The crisis shocks of the Russian economy, increasing in number and severity, as well as the persistence of the global challenges that are gaining strength, require new proposals in the field of modern methods of analyzing economic processes, which are more and more often based on the theory of strategic management with the formulation of priorities for innovative development.

The problem of increasing the innovative activity of companies, attention to which is manifested in works by both Russian and foreign scientists, is considered in several aspects. The work "Innovative aspects of development of the waste recycling industry in the new economic context: Problems and prospects" by Y.V. Morozyuk, A.V. Sharkova, I.A. Merkulina and O.N. Vasilyeva (Morozyuk et al., 2017) presents detailed results of a study concerning the problems and prospects of the innovative development of the processing industry in the context of the technological transformation taking place in Russian economy. A broader approach to forecasting the innovative future of the Russian economy can be noted in the series of works by the academician S. Glazyev, one of which is "The economy of the future: Does Russia have a chance?" (Glazyev, 2017). Both of the aforementioned works, as well as this research, are based on the scientific works by N.D. Kondratiev, presented in the book "Problems of economic dynamics" (Kondratiev, 1989). The scholar considers a wide range of the problems of economic cycles, forecasting and planning of economic processes and market conditions, which remain relevant today.

The scientific work "Flexibility and Endogenous Innovation" by R.M. Solow is useful when choosing approaches to the strategic management of innovative development of the industry (Solow, 2005). Solow, the author of the neoclassical theory of economic growth, recognizes the dominant role of physical capital in economic growth and doesn't have a definite position on the attempts to create a theory of endogenous economic growth. On the one hand, he notes the partly endogenous nature of technical progress for the economy. On the other hand, he emphasizes that in the R&D process, there is an exogenous component in relation to the economy as well. Technical progress, as defined by Solow himself is "any kind of change in the function of production". As a result, Solow concludes that the real value of the endogenous growth theory is related to its attempt to model the endogenous component of technical progress as an integral part of the theory of economic growth.

Today, the agenda of the priority problems of Russian companies experiencing a high degree of competition, both in the national market and globally, more and more often includes issues of strategic management of innovative development of the economy. The classical construction of the innovation system at the national and regional levels in their historical perspective became the object of economic analysis in the work by C. Freeman "The

National System of Innovation in Historical Perspective" (Freeman, 1995). Abstracting from globalization processes and not diminishing the importance of foreign international relations of companies, the scientist reveals the importance of implementing innovations by any firm based on the network of relationships that it establishes with its partners. Freeman reveals the fundamental role of state policy, cultural traditions, industrial relations, technical and scientific institutions, as well as national institutions in the innovative development of a country. Historical examples of Germany, Japan and the former USSR are given, illustrating the formation and development of innovative processes. The existing contrast between the state of innovation in the countries of East Asia and Latin America is described as well.

The strategic approach to innovative development is the subject of analysis in "Looking at Innovation Strategies" by S. Mendell and D. Ennis, (Mendell, & Ennis, 1985). This work presents the results of an extensive study and a generalized assessment by the expert community concerning the state of the US industry, which in the second half of the 20th century demonstrated a downward trend in innovative activity. On this basis, the scientists attempt to study the life cycle of the innovation process and its interaction with the life cycle of the company. Understanding of innovation is not given as a process of scientific and technical change, but as its result. The authors suggest using the term "innovation" in relation to truly new and unique products, processes or services.

The development of the understanding of the impact of innovation on economic development can be found in "The Theory of Economic Development" by J. Schumpeter (Schumpeter, 1995), which argues that innovation has a dual effect on the dynamics of economic growth. On the one hand, it opens up new opportunities for economic expansion. On the other hand, it makes it impossible to continue this expansion in traditional directions. Innovations destroy economic equilibrium and bring disturbances and uncertainty into economic dynamics. According to Schumpeter, innovation is accompanied by the creative destruction of the economic system, causing its transition from one state of equilibrium to another.

The work by Y. Salleh and W.K. Goh entitled "Managing Human Resources Toward Achieving Knowledge Management" (Salleh, & Goh, 2002) is devoted to the role of a person in the creation of innovation. The authors emphasize that the individual plays a fundamental role in the creation of new knowledge, creates an increment in the pool of organizational knowledge, which acts as an engine for the growth and training of an organization, increasing its innovative activity. Similar claims can be found in "Manager's perceptions of learning in new product development" by U. Koners and K. Goffin (Koners, & Goffin, 2007). According to the researchers, companies must ensure that every project developing a new product leads not only to its successful creation but also to the training for the entire organization. The continuation of these views can be found in the work by Russian scientists V.D. Sekerin and A.E. Gorokhova "Assessment Technique of Innovative Production Competitiveness" (Sekerin, & Gorokhova, 2016), suggesting ways of assessment of the competitiveness of innovative products from the standpoint of the formation of key competencies of the learning organization.

A critical assessment of the narrow view on innovation, which is often found in scientific publications of the end of the last century, is given in the work by M. Sawhney, R.C. Wolcott and I. Arroniz "The 12 different ways for companies to innovate" (Sawhney et al., 2006). The scholars believe that a narrow approach to understanding innovation blinds companies and makes them vulnerable to competitors with broader perspectives. This is explained by the fact that single-industry companies, having the same customers with the same needs, make similar proposals, while using undifferentiated capabilities and processes, demonstrating the tendency to recurring innovations. Asking what innovation is, the researchers tried to find the answer from the position of corporate management: faced with slow growth, commercialization and global competition, many CEOs see innovation as something critical for corporate success. It is emphasized that the general director should avoid short-sightedness when constructing strategic priorities in the field of innovative solutions.

The analysis of modern determinants of innovative activity of companies is the topic of the study presented in the article by M. Hermann, T. Pentek and B. Otto "Design Principles for Industrie 4.0 Scenarios" (Hermann et al., 2016). The researchers associate innovative development and change with the entry of industry into a new phase of Industry 4.0, associated with the development of computer technology in order to increase profitability and productivity. The authors believe that the growing use of social networks in recent years has forced companies to show their presence on these platforms and use social media as the main source of information that is meaningful to them. The evidence base of the study is associated with a comparative analysis of leading companies providing research/consulting services in the field of information technology, as well as companies working in the field of enterprise resource planning.

A broader view of the factors of innovation development, also related to the Fourth Industrial Revolution, is reflected in the article by G.P. Li, Y. Hou and A. Wu "Fourth Industrial Revolution: Technological Drivers, Impacts and Coping Methods" (Li et al., 2017). In addition to digital technology, the authors draw attention to physical and biological technologies that have reached unprecedented development and have found their application in various industries. The researchers do not just describe the specific technological niches of each type of technological driver; they assess the impact of the Fourth Industrial Revolution on global industrial, economic and social development as well. The authors also suggest possible measures and policies for governments and firms, which would help them overcome modern technological challenges.

In the work "Relationship between cooperation networks and innovation performance of SMEs" by S.X. Zeng, X.M. Xie and C.M. Tam (Zeng et al., 2010), the complexity of innovation processes is noted, which has led to a significant increase in the use of external networks by small and medium-sized enterprises. The study found that there are significant positive relationships between inter-firm cooperation, cooperation with intermediary institutions, research organizations and the innovation activities of small and medium-sized enterprises. Of all the interactions, only inter-company cooperation has a significant positive impact on the innovative activity of enterprises, while relations and cooperation with government agencies do not have a significant impact. In addition, the work indicates a more prominent role in the innovation process of enterprises of vertical and horizontal cooperation with customers, suppliers, rather than those of horizontal cooperation with research institutions, universities or colleges and government agencies. There are a lot of other works, which analyze various facets of clustering phenomenon and its impact on technology transfer and innovation creation and regional development (e.g. Tvaronavičienė, Razminienė, 2017; Bublienė et al., 2019; Eddelani et al., 2019).

3. Methods

The study is based on a synthesis of scientific positions of foreign and domestic researchers and economists, whose interests lie in the sphere of innovations, including the innovation and technological modernization of industrial enterprises. The authors rely on the concept of periodic fluctuations in economic activity (Kondratiev, 1989), the concept of national innovation systems (Freeman, 1995), innovation theory (Schumpeter, 1995); process (Glazev, 2017) and objective (Mendell, & Ennis, 1985; Baltgailis, 2019) approaches to understanding the essence of innovation. The statistical data of the World Bank, the International Monetary Fund, the Federal State Statistics Service, the international consulting firm McKinsey & Company, and other authoritative organizations served as an information base for this study. Formalization and generalization of the research findings were conducted using general scientific methods of cognition: the dialectical method, the method of analogy, analysis, and synthesis, as well as using special methods of empirical knowledge: scientific forecasting, analysis of economic and statistical indicators, comparative analysis and Delphi exercise.

4. Results

4.1 The determining influence of the innovation potential in Russia's GDP growth

Today Russia faces ambitious goals to increase GDP growth by introducing innovations because other factors do not have significant potential (Russia: Commitment to Innovations, 2015). After the rapid growth in the early 2000s, the crisis of 2008, the subsequent slow growth and the current recovery from the 2014-2015 crisis, the issues of accelerating GDP growth come to the fore within the context of a decline in working-age population and a turbulent economic environment. In 2017, the global GDP grew by 3%, which is significantly higher than Russian growth rates (Figure 1). In recent years, the role of the working age population – one of the GDP drivers – is rapidly declining. At the same time, in terms of unemployment, Russia is comparable to developed countries (5.1% in Russia versus 4.4% in the UK in 2017). In general, the current situation correlates with the global trend of the aging population. Therefore, this factor does not imply a significant contribution to GDP growth. Since 2008, there is an increasing trend for declining investments in fixed assets (Glazev, 2017). In the coming years, its dynamics may change to the opposite (Figure 2). However, despite the gradual recovery of investment volumes to the level of 2013-2014 and a positive attitude in the business environment, geopolitical risks and a high degree of uncertainty regarding its contribution to GDP persist.

Fig.1. GDP dynamics in Russia
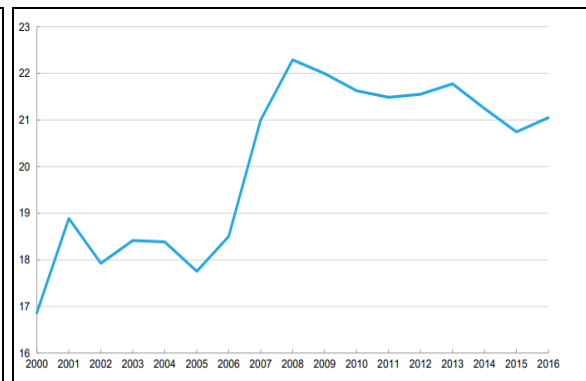
Fig.2. Investments in fixed capital in Russia, % of GDP

Source: World Bank www.worldbank.org

The analysis of trends in the availability of financing, based on the key rate of Central Bank in recent years, shows an increase in this indicator since the last crisis (17% at the beginning of 2015 and 7.25% in June 2018). A similar situation is observed in many other countries. In terms of labor productivity in various sectors of the economy, Russia retains a significant growth potential being the most tangible in the field of research and development (Figure 3). As follows from the example of South Korea (Li et al. 2017), this factor is amenable to transformation in the foreseeable time horizon. Thus, it is the productivity increase achieved through innovation that can become a driver in GDP growth in Russia.
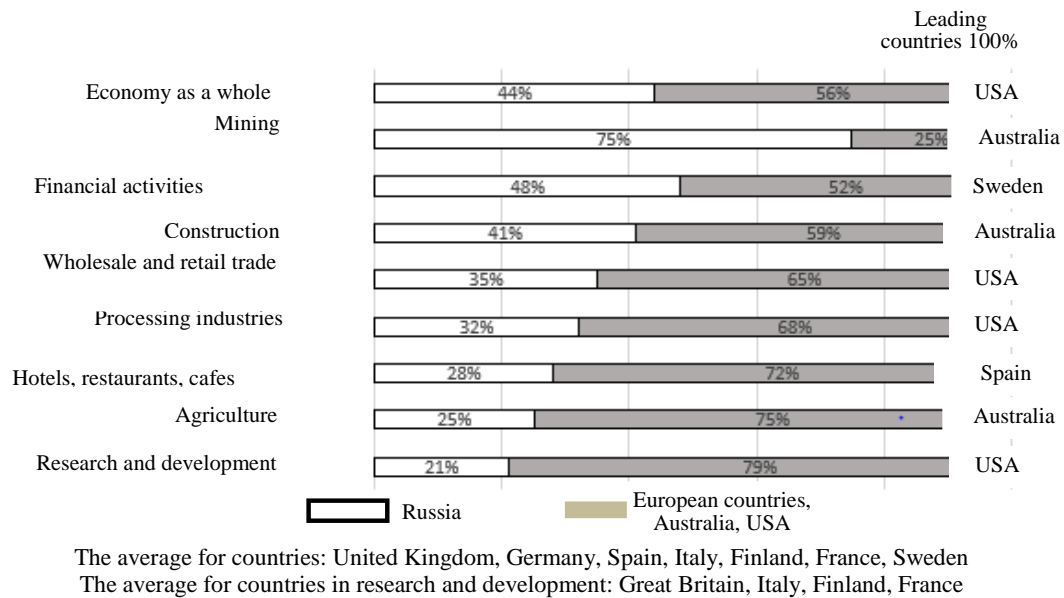
Fig.3. Labor productivity in Russia in 2016 compared to the European countries, Australia and the USA
(GDP in terms of purchasing power parity per employee, % of the leading country)

Source: IMF; Rosstat; Australian Bureau of Statistics; Eurostat;
IHS Markit Comparative Industry 2018q1; U.S. Bureau of Statistics

Since 2010, the contribution of the productivity factor – innovation – has had significant impact on GDP growth: in 2010-2014, it provided 1.1% of the country's annual GDP growth. Depending on the scenario, the predicted values of GDP growth differ significantly (Figure 4).

In the basic scenario of the Ministry of Economic Development, GDP growth until 2020 is about 2.2%, which is higher than the GDP growth rates of recent years, but not enough to achieve the average global growth rate. In the optimistic scenario, GDP growth rates are close to the world average (about 2.6% per year) with innovations and an increase in the capital factors as the main contributors to GDP growth. The ambitious scenario assumes implementation of the target to increase GDP per capita by 1.5 times due to the activation potential of innovation in the coming years with a view to increasing the annual GDP growth to 5.7% in 2021-2025. This would allow Russia to enter the fifth place among the global economies and outpace the global average growth rate (The Ministry of Economic Development of the Russian Federation, 2017).
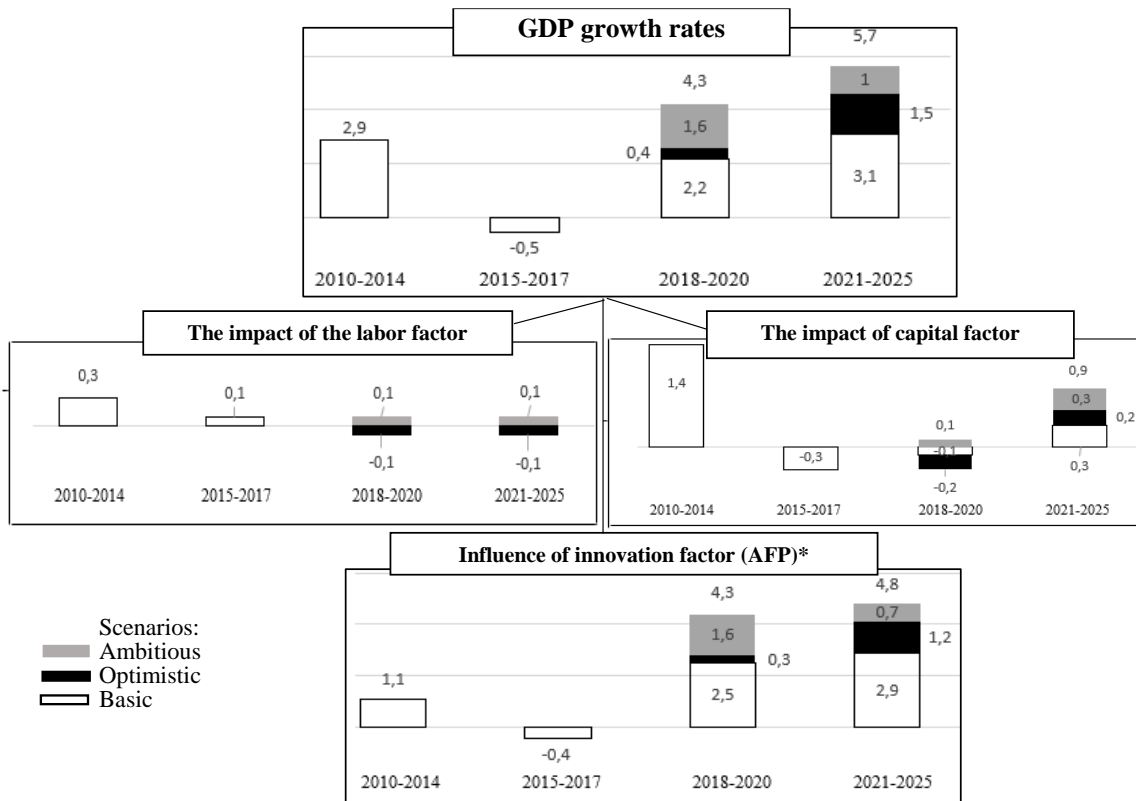
* Aggregate factor productivity reflects the impact of innovation on the economy in a broad sense and is calculated as the total GDP growth minus the factors of production (labor and capital)

Fig.4. The change in the influence of three factors on GDP growth

Source: The World Bank; the Ministry of Economic Development of the Russian Federation; Rosstat; FRED

The fact that the dynamics of innovation development in Russia based on the assessment of the innovation component of the World Economic Forum global competitiveness rating demonstrate a positive trend (an increase of 29 points over four years) speaks in favor of the optimistic and ambitious scenario. However, the growth potential compared with the leading countries (in terms of GDP) still persists (Table 1).

Table 1. Innovative component of the global competitiveness ranking

Country	Place in 2013	Place in 2017	Dynamics
Switzerland	2	1	↑ + 1
USA	7	2	↑ + 5
Israel	3	3	0
Finland	1	4	↓ − 3
Germany	4	5	↓ − 1
Korea	17	18	↓ − 1
China	32	28	↑ + 4
Czech	37	36	↑ + 1
Spain	34	42	↓ − 8
Russia	78	49	↑ + 29

Source: The Global Competitiveness Index, World Economic Forum

Therefore, the emerging positive trend of Russia's innovative development is a clear testimony of its global competitiveness under the conditions of the new reality.

4.2 Innovations as instruments for flexible adaptation of companies to the new reality

Best practices in the development of innovations include both specific principles for working with innovations (Sawhney et al., 2006), and specific tools (Salleh, & Goh, 2002; Koners, & Goffin, 2007). Global experience shows that innovations require systematic management of each of the following five success factors:

1. Innovative strategy and ambitious goal-setting is a key success factor for innovations. A business strategy and goals should include innovative priorities, key instruments to achieve them, as well as quantitative and qualitative key performance indicators (Mendell, & Ennis, 1985; Prahalad, & Hamel, 1994).
2. It is important for companies to conduct the broadest possible search for opportunities (tracking trends, identifying consumer interests and expectations) for early identification of opportunities and threats to the business, for creation and development of new business models based on competitive advantages, for systematic work with better opportunities, to define a set of external partners providing access to a large number of advanced approaches and technologies (Marsh, 2015).
3. To ensure the successful development of innovations, companies need to implement an appropriate organizational structure; have the resources (finance, personnel, skills); be flexible in redistribution of resources for the development of innovations (Solow, 2005).
4. Companies need to pay particular attention to the system and management processes. It is important to ensure effective technologies for working with innovative projects and the mechanism of portfolio management, to master the principles of risk management (Hermann et al., 2016).
5. Companies need to create an internal culture of innovations, give them high priority, involve all employees in this process, stimulate the search and elaboration of new ideas (Zeng et al., 2010; Sekerin, & Gorokhova, 2016).

Furthermore, companies need to efficiently reallocate resources. Those companies that redistribute resources more often achieve greater success in implementing long-term breakthrough innovations. Thus, the share of budget redistribution among high-performing innovative companies is 5-20%, among low-performing ones – up to 5% (McKinsey Innovation Practice Development Center, 2018). High-performance companies spend much more resources on introducing radical (38% of the innovation portfolio resources) and breakthrough (28%) innovations. For low-performing companies, these values account for 23% and 10%, respectively. World experience shows that even the introduction of one key factor to the success of innovations can significantly increase the average performance of the company, and the introduction of 3-4 factors provides a significant competitive advantage (Figure 5).
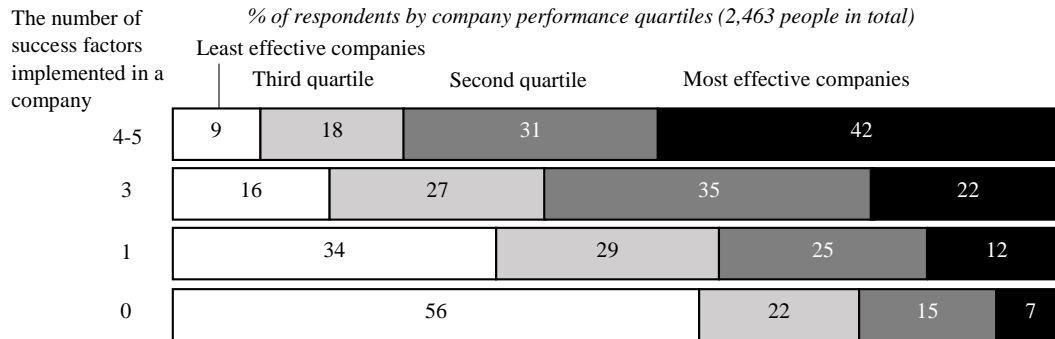
Fig.5. The influence of success factors on the effectiveness of innovation

Source: Compiled by authors

The above implies a very important conclusion about the critical importance of the proper choice of adequate innovation tools (Schumpeter, 1995) corresponding to the strategic objectives of the company's innovative development. Despite the fact that a company's executives understand the need to manage innovations, not all of them are confident of its success. This is because from time to time they face several difficulties – among which the most significant are: traditional corporate culture (36% of the respondents), poor understanding of trends (26%), lack of professionals (25%), inefficiency of the organizational model (24%), lack of the necessary IT infrastructure (23%), lack of funding (21%) (CB Insights University, 2018).

The global practice shows that obstacles to creation and development of innovations in companies are observed in each of the five key success factors (in Russia as an inexhaustible source of growth):

1. In terms of goal-setting, companies often lack an innovative strategy for capturing target customer segments and targeted customer service awareness, which would entail an innovative strategy, as well as ambitious goal-setting.
2. Working with the sources of ideas for innovation is often chaotic and reactive in nature and is done only following negotiations with clients or the introduction of a new product to the market by competitors. Work on innovation is often limited by the scope of the company.
3. The organizational structure of a company often lacks resources and personnel with the necessary skills to manage innovations. Operational goals and innovations come into conflict when the same people are involved in both processes.
4. Innovation managers often skip a preliminary assessment of potential and avoid prioritization in building the innovation portfolio. The elements of project management are not used systematically, while there is a shortage of methods and competencies.
5. In a corporate culture, there is a poor understanding of common goals, which is necessary for effective cross-functional interaction, as well as low risk-tolerance when testing innovations at all company levels. Business managers should regularly assess the effectiveness of innovations in the company, develop a targeted strategy of innovation, identify priorities, and build a systemic work on success factors for innovations.

5. Discussion

Earlier, the government's role in the innovation process was to create an innovative environment in which all market participants could effectively develop and introduce innovations, as well as to sponsor basic research and new developments. In today's increasingly complex world, with a high degree of mutual penetration of industries and a growing rate of change, the government's role becomes even more significant (Morozyuk et al., 2017). By

pursuing the policy of innovative development of the country, including the development and implementation of an industrial development strategy, the government does not only provide financing to strategically important promising projects but also directly affects industries' innovative development.

Conclusions

In today's reality, innovations serve as an effective tool for solving strategic tasks throughout the national economy (Freeman, 1995) and each specific company, because they determine the acceleration of development rates, strengthening leadership and competitive advantage, and provide timely protection from damage to the industry in the case of introducing radical innovations that make economically inexpedient the entire areas of business. Several industries in the Russian economy are promising for the development of innovations. They have the necessary scale of production (oil and gas, energy, metallurgy, etc.) and can become the driving force behind the introduction of breakthrough technologies and the national innovation centers (Knyaginin, 2017).

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CONCEPT OF ENTREPRENEURSHIP ANTI-IDEOLOGY

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Abstract. This paper presents the approach to the understanding of the entrepreneurship phenomenon. With this approach, it is possible to identify this social activity as essentially distinct from those that are seemingly similar but distinct in content. Having reviewed the relevant literature of this area of study with a critical eye, the author has identified systemic errors in the traditional understanding of entrepreneurship (first-order and second-order errors). Developing this approach, the author has introduced the concept of anti-ideology, which mirrors a nature of innovating as a process of creative destruction. This statement assumes that true entrepreneurship exists within the idea/anti-idea framework. The author has identified mandatory and sufficient attributes of entrepreneurial innovation. Based on the applied methodology, the author has proposed a model of progressive materialization for the anti-idea (Progressive Materialization of Anti-idea, PMAi). It helps to measure entrepreneurship in terms of its innovating component.

Keywords: entrepreneurial creativity; model of progressive materialization of entrepreneurship anti-idea (PMAi); innovations; entrepreneurship attributes

1. Introduction

Entrepreneurship is getting more and more crucial in the economy. In today's world, the entrepreneurial mind-set has acquired structure within the framework of social relations. The recent growing interest in this phenomenon is owed to the unprecedented pace of technological advancements and rapid economical development. This growth has provided incentives to the wider consumption of goods, provoking market participants to produce products and services that are fiercely competitive and advantageous to consumers. Globalization essentially exacerbates this trend, as the division of labour leads to the diversification of production facilities. Together this has created a demand for the personality of the entrepreneur who, active in business, has an innovate and singular way of thinking as a distinctive feature. It is this phenomenon on which people lay their hopes when they solve the issue of creating new market opportunities in the world of excessive surplus. The mentioned issue predefines the chosen object of research.

Now at this point, it is important to specify the scope of economic relations which innovation creates, i.e., the sphere of entrepreneurship that results in commercially introducing goods previously unavailable in the mass market. Therefore, this area of research identifies those specific features that are inherent in the innovating entrepreneur, and making it possible for him/her to develop as an entrepreneurial genius. This leads to a need in completing a number of individual academic objectives, including highlighting certain attributes of such innovation, specifying the relationship between personal creativity and entrepreneurship. It is extremely difficult to find solutions to the mentioned problems. Among the reasons for that is the distorted idea of the entrepreneurship nature in terms of its true creative meaning.

2. Literature review

Researchers pay close attention to the entrepreneurship phenomenon. Such categories, as self-employment, small business, family business, start-ups, innovation-based and social entrepreneurship are equal activities in various sources. In nature, each of the mentioned economic activities has a distinct agenda and their merger often leads to the erroneous understanding of this phenomenon. For instance, in the paper on 'Entrepreneurship in Terms of Uncertainty', Sotnikova, Skvortsova and Lebedeva (2015) refer entrepreneurship to the activity of companies in general, excluding their specifics, size, etc. At the same time, in the paper on 'Support to Entrepreneurs' in Russia, Barinova, Zemtsov, & Tsareva (2018) apply the same concept to small businesses.

There is the similar terminology-related confusion in many papers on the features that describe business entities to one degree or another: ethnic (Ryazantsev, 2000), gender (Yudina, 2013; Gallyamov, 2016), age-specific (Semenova, 2018), etc.

When exploring the entrepreneurial success, Acharya, Rajan, & Schoar (2004) review small firms involved in agriculture. Proceeding from the self-employment criteria for survey participants, van der Loos *et al* (2013) explore the effects that testosterone has on entrepreneurial behaviour, Brandstätter (2011) reviews business owners in the research of personality aspects in entrepreneurship. Matthew and Williams (2014) (in their assessments of entrepreneurs' decision-making opportunities) examined the participants, who had said that business had been their primary source of income.

Confusion arises from mistaking entrepreneurship with other types of economic activity. The most common error (*first-order error*) is the perception of entrepreneurship as a business making process. This means that people think that consider one an entrepreneur (business person, manager, investor; intermediary business owner) if his/her activities focus on economic benefits regardless of target figures and the nature of their business.

As we have mentioned above, the nature of these two types of activities (innovative-production and private business) is not the same, although people often refer them to the same concept of entrepreneurship. Their differences explain behavioural motives and a content-related side of business. Researchers distinguish the following main personality traits that are necessary for implementation of small business projects: independence, a risk taker, the ability to take responsibility for performance, higher work capacity (Soininen, Puumalainen, Sjogren, & Syrja, 2015; Begley & Boyd, 1987). Small businesses are mostly not innovation-based, i.e., do not lead to structural qualitative economic changes, but serve as a basis for economic stability and growth (Romanova, Korovin, & Kuzmin, 2017; Kowo, Adenuga, & Sabitu, 2019). At the same time, high-tech innovation requires fundamentally opposite traits (Dyer, Gregersen, & Christensen, 2008; Toomsalu, Tolmacheva, Vlasov, & Chernova, 2019), namely: the ability to innovate (creative thinking), to think of usual things outside of the box (divergent thinking), and to develop critical thinking, higher level of education in certain areas of knowledge, skills to make a relevant group and work in a team of highly qualified specialists.

The abovementioned terminology-related confusion causes systemic errors in the policy that define measures to support and develop entrepreneurial initiatives.

Various researchers confirm the idea of the existing entrepreneurial intelligence (Gardner, 2007), but what exactly forms the intelligence has not yet been clear. In general, Tschepurenko and Yakovlev (2013) and many others believe that the innovating entrepreneur is a person with an appropriate type of the genius (talent) as a distinct ability that differs the person from other types of genius in fields of logics, linguistics, etc. Repeated efforts to define the components of the genius (talent) have not yet led to impressive results (Kislin, 2008). There are many doubts in scientific validity of such attempts. Not all the researchers support the idea that the genius (talent) is an innate ability and stays undeveloped throughout the life (Day, Boardman, & Krueger, 2017).

The search for evidence of the entrepreneurial genius, its criteria, development of the methodology for its development and prospects for the methodology to be applied in the development of managerial competencies are main tasks that researchers face in this area.

The classification of the psychotypes, which economic entities (Litau, 2019) belong to, will make it possible to differentiate their functional role in business and find their attributes. Researchers have dome multiple efforts to identify entrepreneurship components. As a result of such studies, models REASEC, META approach, etc. have grown in popularity (Annex). In attempts to identify key traits of the successful entrepreneur, researchers have repeatedly used the well-known five-factor model developed by Costa and McCrae (1995), so-called Big Five, which includes the following components: extravert nature, openness to experimenting, emotional stability, consciousness, and no-conciliation habitude. It seems that each of the mentioned qualities to one or another degree describes the entrepreneur. However, it can equally belong to the people engaged in any other business. Hence, the model (in terms of the science methodology) is not a sufficient and necessary attribute of the entrepreneurship phenomenon (*second-order error*).

All of the entrepreneur's traits (see Annex) implicitly have a methodology-related error. The presented descriptions of main traits do not make it possible for us to highlight the innovating entrepreneur's personality in an unambiguous way, as an enumeration of traits does not provide us with a holistic view of the phenomenon.

3. Material and Methods

So far, we have not had a clear definition of entrepreneurial creativity and features that help us to distinguish entrepreneurial creativity from other types of creativity. Researchers have not yet made fully clear the psychometric characteristics of this type of talent. It is crucial to understand what a sufficient attribute of the entrepreneur is, i.e. identify a fundamental and inherent trait that provides for the genesis of this phenomenon itself. The phenomenon under consideration discloses itself in the course of a creative action.

Economic activity of the subject should lead to appearance of the product, which (as we might consider) is a result of creativity. Creativity is an activity, in the process of which people create qualitatively new values or produce something objectively new. The unique character of its result is a main criterion that distinguishes the entrepreneurial creativity from other economic activities (Masloboeva, 2016). Leasing of commercial real estate, retail trade, etc. are not creative entrepreneurial activities. They are examples of efficient economic activities aimed at economic benefits, but they are not innovative in any way.

The category of creativity has symbiotic relationships with destruction (creation through destruction). The understanding of entrepreneurial activity as aimed at destruction corresponds to the dialectical negation law in terms of academic logic. We might state that entrepreneurial activity generates a contradiction by means of

creating the new and destroying the old. Thus, the dialectical contradiction is a distinguishing feature that describes entrepreneurship and distinguishes it from all of the other activities, despite the fact that names are the same due to the circumstances. Consequently, the subject, who initiates this type of activity, is an innovating entrepreneur, so significant for the economy.

This leads to the conclusion, which is the most important for the understanding of this phenomenon. Any object newly created by innovation must have a pair (anti-object), something that will be destroyed as a result of creating the new object. The absence of the mentioned dynamics in the development of the produced pair of goods points to an uncreative nature of activity, assuming that the activity is not entrepreneurial in the given framework.

The availability of the anti-object is a criterion of the entrepreneurial idea. The pairing test allows verifying the results of *labour in business* (assuming production of goods, works, and services) for compliance with the activity referred to as entrepreneurial and innovative. In this context, the newly created object (good) simultaneously assumes the anti-idea, something that will be destroyed upon implementation of the innovative component. Based on significance and prevalence of the anti-idea, we can make reasonable predictions on significance of the entrepreneurial idea.

Thus, in terms of creation-destruction, a sufficient attribute of entrepreneurship is the activity, in the process of which people produce the new good, introduction of which inevitably leads to the destruction of available ones and the evolutionary change in socio-economic relations. These new goods and methods compete with the old ones and thus competition leads to socio-economic progress in society.

Further, in compliance with the theorization methodology, we will identify attributes of entrepreneurship.

4. Results and Discussion

Real entrepreneurial creativity has inextricable connections with gaining of economic benefits. This implies the most important component: entrepreneurial creativity does not exist outside of its connection to the economic life of the society. It is impossible to assess the significance and scale of the entrepreneurial idea if it is not implemented. The action of creative destruction must also happen. Therefore, a necessary attribute for the entrepreneurship and innovation is the inalienable connection of the economic entity with the society expressed in socio-economic relations that arise regarding the introduction of the newly created good.

Innovating entrepreneurs do not have distinctive external features that would help to distinguish them from other entities. At the same time, achievement of the commercial success often requires considerable time. The paradox is that there is a public need in innovators, but what they exactly are is unclear until the success in their business. Only Schumpeter managed to overcome this challenge when he considered the entrepreneur through creative destruction, thereby referring to the most important category of creativity (Schumpeter, 1942). We can show Schumpeter's creative destruction as a process of a search for the anti-idea and we have used this in the proposed model for entrepreneurship formalization.

The entrepreneurship anti-idea progressive materialization model (PMAi) (Figure 1) might serve as a basis for the assessment of innovative concept significance and further development of the system of criteria to assess scale and usefulness from possible materialization of the entrepreneurial creativity.
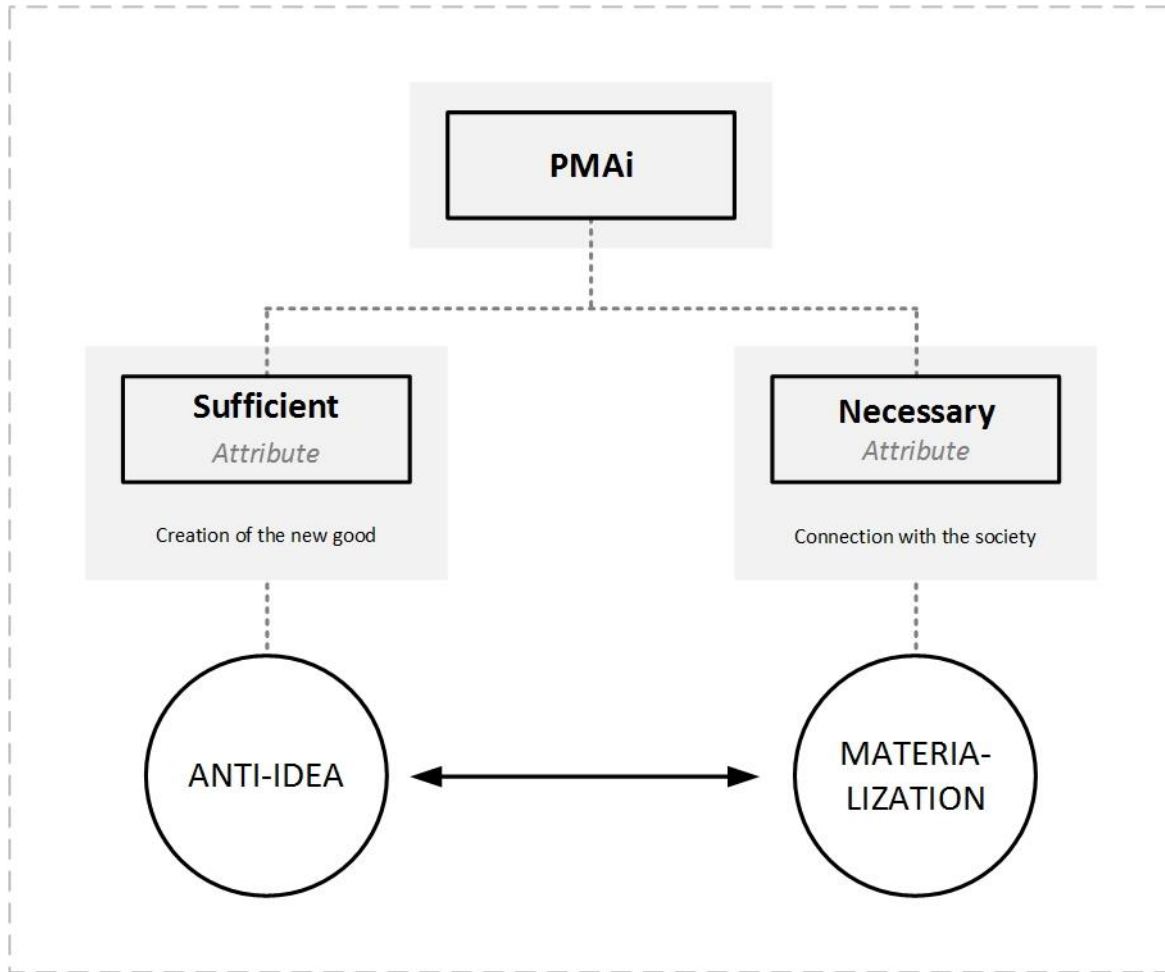
Fig. 1. Model of progressive materialization for the entrepreneurship anti-idea

Anti-ideology is a combination of the goods, which will be jeopardized in case of implementing the entrepreneurial idea. The model shows an inextricable connection between the materialization of the entrepreneurial idea and the destruction of existing goods that simultaneously occur. The absence of this bond assumes the absence of the innovative component in the idea under consideration.

Prior to materialization of the entrepreneurial idea, its social necessity is considerably uncertain. We broadly understood social necessity assuming the achievement of commercial success and social benefit. The measurement of the entrepreneurial idea value from this point of view makes it possible to evaluate its capacity.

The anti-idea progressive materialization model clearly shows an internal connection of necessary and sufficient attributes of entrepreneur's innovation. The proposed attributes (creation of the new good and bond with the society) reveal its content and make the basis for the development of tools, using which we can set it off against other types of economic activity.

In quantitative measurements of the entrepreneurial idea value, we come from a scale of its influence on the market and from a level of its social utility (Figure 2).
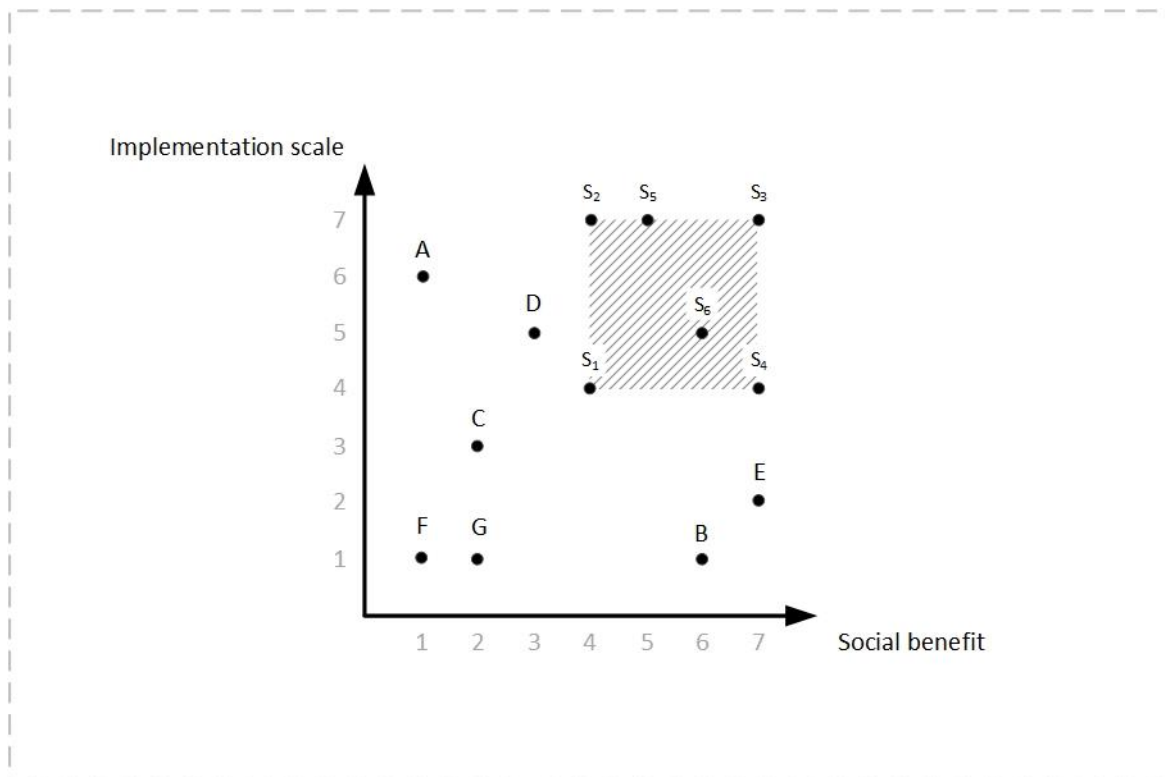
Fig. 2. Value of entrepreneurial idea significance (rate range: A - high value of implementation scale and low significance, B – is low value of implementation scale and high significance, C, D, and E – are the best range of quantitative estimates)

We measure idea significance in terms of the social benefit. Implementation of the idea destroys an available good, thereby starting the process of economic development. Therefore, the new good must be beneficial in itself. To measure significance of the entrepreneurial idea, there is the chosen optimal range of quantitative ratings from 1 to 7. We consider it optimal for sociological, marketing, and economic research (e.g., Likert scale) (Reshetnikova & Dovgan, 2015). The second parameter (scale level) lies on assessment of the idea distribution (sales might serve as such a criterion).

It follows from Figure 2 that the shaded area is the most desirable both in terms of the economic benefit for a single subject, who implements an innovative idea, and in terms of the society. Undoubtedly, there might be the good with a poor social benefit and wide distribution.

Thus, the PMAi model allows measuring the entrepreneurship in terms of the innovative component.

Following up upon the discussion of the author's approach, it is time to point out that people erroneously consider the entrepreneurship phenomenon within the framework of economics outside the transdisciplinarity methodology (Bazhanov & Scholz, 2015). Most of the activities done by the entrepreneur are only possible through solving of comprehensive cognitive tasks. Hence, in order to understand the entrepreneur's traits, one needs to know a lot about how the human mind works. At the same time, we are sure that there are certain features of thought processes that are typical for the entrepreneurial and innovative type of the personality. While researchers of entrepreneurship are just starting to apply methodology of neuro sciences (Laureiro-Martinez, Brusoni, Canessa, & Zollo, 2014; de Holan, 2013; Ortiz-Teran, Turrero, Santos, Bryant, & Ortiz, 2013), close attention to the brain and its operation has had a long research tradition with the focus on ways of thinking's influence on underlying

motives (Goodale, Kuratko, Hornsby, & Covin, 2011), narratives (Garud & Giuliani, 2013), aspirations (Armstrong & Hird, 2009), actions (Townsend, 2012), imagination (Cornelissen, 2013), cognition (Mitchell *et al.,* 2002; Chuvikov, 2017), knowledge (Shane, 2000; Vlasov, & Demin, 2017; Vlasov, Juravleva, & Shakhnov, 2019), intuition (Mitchell, Friga, & Mitchell, 2005), and even the way of thinking (Haynie, Shepherd, Mosakowski, & Earley, 2010). At the same time, they attempt to explain the relationship between mental operations and a specific action or no-action in terms of entrepreneurship.

It is worth paying attention to the fact that setting off the personality against other psychotypes helps to attribute something as the entrepreneurship. In this context, we can use results of psychological and neuropsychophysiological research to design efficient groups of managers.

Conclusion

People have started to perceive the innovating entrepreneur as a structure-forming element in economic development. The growing number of papers on this subject clearly confirms this. Our research has made it possible to elaborate entrepreneurship theorization and make this phenomenon formal.

In the course of the research, we proposed the approach to understanding of entrepreneurship. The approach makes it possible to identify this activity as essentially distinct from other similar economic activities. We refer entrepreneurship and innovation to the subject's activity aimed at deriving economic benefits to create new goods. The introduction of new goods inevitably leads to the destruction of existing ones and an evolutionary change in socio-economic relations. In the framework of this approach, we have introduced the concept of anti-ideology in entrepreneurship. The concept mirrors the nature of innovating as a process of creative destruction. This methodological principle is a basis for the model of progressive materialization of the entrepreneurship anti-idea (PMAi). It makes it possible to evaluate the capacity of an entrepreneurial idea before time of its implementation.

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Annex. Overview of perception and entrepreneur's personality traits (second-order errors)

Source	Model/Key parameters
Timmons (1994)	Imposed obligations and determination, leadership, constant search for new opportunities, risk tolerance, ambiguity and uncertainty, creativity, self-confidence and ability to adapt, motivation for excellence
Gray (2002)	Based on the model proposed by J. Timmons, contributing the mandatory component: motivation and driving force
Holland (1997)	RIASEC model: Realistic (R), Investigative (I), Artistic (A), Social (S), Enterprising (E), Conventional (C).
David, & Edward (2011)	Striving for achievements and recognition + internal locus of control
Ahmetoglu (2011)	META-approach, presented as a 4-axis structure: sensitivity to emerging chances, creativity, opportunism, and farseeing
Shane & Nicolaou (2010)	Extrovert in nature, openness to new experience, friendliness, consciousness, emotional resilience
Singh, & Rahman (2013)	Creativity, innovation, dedication and hard work, good planning, sincerity and commitment, endurance, personal resourcefulness, self-efficacy, ability to take risks, ability to make decisions, flexibility, target orientation and internal locus of control
Desai (2001)	Emotional resilience, personal relationships, attention and tact
Ehigie, & Umoren (2003)	Self-concept, perceived managerial competence, operational pressure, duties at work
Acharya, Rajan, & Schoar (2004)	Self-efficacy, locus of control for the both states
Bulu (2005)	Success, hard work, good idea, money
Hui, Csete, & Raftery (2006)	Self-efficacy, locus of control, decision making, attitude towards risk
Nandram, & Samson (2007)	Attention to detail, ability to see chances, persuasiveness, target-orientation, self-confidence, creativity, courage, reliability, ambitiousness, tenacity, disposition toward empathy, locus of control
Papz, A., Zarafshani, K., Tavakoli, M., & Papzan, M. (2008)	Need in achievements, innovations, internal locus of control, marketing, no bureaucracy, entrepreneur's success
Abdullah, Hamali, Deen, Saban, & Abdurahman (2009)	Progress, decision-making and achievement-oriented thinking, risk management, tenacity, establishing of contacts, optimism
Man (2019)	Active experimenting, authenticity, social interaction, sense of ownership, support
Karabulut (2016)	Locus of control, need in achievements, risk tolerance, entrepreneurial vigilance, entrepreneurial intentions

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TRADE OPENNESS AND CO₂ EMISSIONS NEXUS IN OMAN

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Abstract. Trade Openness (TO) has a strong role in the development of an economy but its impact on the overall environmental profile of a country is debatable. This analysis is focused to test how trade openness affects CO_2 emissions in Oman. Unit root tests are conducted and ARDL model is employed using data from 1972-2014. The results of the study suggested that both Gross Domestic Product (GDP) per capita and trade openness seem to have the positive impact on CO_2 emissions. It means that a higher GDP per capita and trade openness destructs the environment in the country. The results leave space for Oman's government to consider the environment while devising its trade policies.

Keywords: trade openness; CO_2 emissions; per capita GDP

1. Introduction

Trade openness is one of the most influential determinants of economic growth of a country, and due to its widespread effects, countries tend to focus on improving it to achieve better financial results. With a large number of countries being a part of the World Trade Organization (WTO), a dominant sentiment across the global economy is to focus on more relaxed and even free trade policies. The purpose of these free trade policies is to reduce dependence on the local economy and attain benefits from strengthening trade relationships with other countries. Nevertheless, while delivering many benefits to the host and home countries, trade openness also seems to have some adverse impacts as well that cannot be ignored.

With strong trade-ties, countries rely on each other in many domains and their focus is on achieving an optimal production and trade position that gives maximum results. Eventually, trade openness does bring in higher

economic and production activity in the country, which is inevitable. Researchers argue that higher economic and trade business in a country means more usage of natural resources, that eventually puts adverse impact on the environment. Another discussion that enters the equation is how countries start emitting more CO_2 when their trade activity increases, but with time, they tend to tackle that challenge as their economic condition gets better (Mahmood et al. 2019).

According to Mahmood and Alkhateeb (2017), trade and environment are firmly connected, and in their study, they also proved that the environmental Kuznets curve (EKC) does prevail in Saudi Arabia while developed an idea of how to trade activities might affect the environment negatively. Chen et al. (2019) mentioned in their analysis that trade openness and export activity tends to produce higher emissions. Their study was conducted on China since the country is responsible for 28% of global emissions. Using a multiregional input-output model, the study used 2007 data, and the findings suggested that trade and outsourcing result in a partial increase in CO_2 emissions. Hence, structural reforms are required in this sector to ensure that higher economic and trade activities do not leave the environment ignored while devising policies.

Although the idea of the environment getting affected by trade is a debatable issue in the field of literature, many studies strongly argue about the existence of a profound relationship between both variables. Trade can lead to CO_2 emissions because to indulge in trade; countries produce more products, which require a higher exploitation rate of natural resources. It can be in the form of natural gas, coal and many more resources while the production process emits greenhouse gases in the environment that is destructive for the overall ecological profile of the country (Kim et al. 2019). Mahmood et al. (2018) talked about financial development and foreign investment affected environment in East Asia and argued that trade openness could lead to higher emissions in the host country and on top of that, there is also a spillover effect of these trade activities on the neighboring countries. Hence, trade openness does not only influence the countries involving in trade but can be destructive for the environment of the surrounding states as well. On the other hand, Shahbaz et al. (2013) argued that financial market carries encouraging environmental effects in Malaysia by reducing emissions.

For many countries, it is an on-going trade-off, and they have to make a rational and strategic decision as to what matters to them the most. If economic growth and open trade has more importance for a country and can help it meet its long-term economic needs, the idea of reducing emissions might go into the background with a possibility of neglect and vice versa. In those instances, countries can focus on the demand levels of both segments and see which one has a higher demand and need in the economy. No matter what they end up deciding, one section has to be given a priority over the other, and both goals of open trade and lower emissions cannot be met at the same time.

It is mentioned by Ren et al. (2020), production and consumption in a specific capacity do seem to have a strong influence on emissions and how taxes are being implemented in that domain. In some countries, e.g. Chile manufactures of products leading to emissions are taxed more than the customers while in Sweden, customers have to suffer that penalty. Either way, the purpose of these taxes is to tackle the higher emissions in the products sector, and the net outcome might be the same. For countries trying to avail open trade opportunities while keeping the emissions lower at the same time, there is a need to consider implementing emissions taxes that can help reduce the effects of a sudden emission shock that these trade activities can give to the economy. Nevertheless, it all depends on how much the government of a country wants to tackle that issue and which of the two segments make it to the top of their priority list. In some instances when a country is promoting open trade, they also want to encourage their local manufacturers and customers in the domain since they would be responsible for giving a boost to those trade activities and if anyone of the two is discouraged, the trade net might fall apart eventually.

The idea of trade liberalization has been a focus of attention for many years now and considering the fierce economic competition across the world; countries are focusing on optimizing their position in the global market. In a pursuit to achieve that, trade openness plays a vital role since it allows them to look out for each other and live on each other's expenses. The concept of comparative and absolute advantage also comes into play in this regard when countries consider if it is cheaper for them to produce something in their homeland or get it traded with another country. While trade liberalization can play a strong role in achieving a competitive stance in the global market, greenhouse gas emissions can go ignored. Talking about WTO countries specifically, emissions are not just specific to their production structures but can be imported from other countries as well through consumption of goods under trade treaties (Levitt et al. 2019). Considering the influential role of trade openness in higher emissions, not enough literature is available on the Middle Eastern region, specifically Oman. Being a major oil-producing country, Oman has a strong position in the global market, and it is crucial to understand how its economy is getting affected by trade openness. Through the past decade, the country's energy sector has gone through some significant structural reforms, and there is a scope to understand how the trade policies of the country need to be reconsidered that take the environment into consideration (Albadi 2017). Regardless of it eventually being a trade-off, there must be some actions that the government of Oman can consider to bridge the gap between the trade and the environmental sector so both can operate side by side.

2. Literature review

The literature available on trade openness and CO_2 emissions in Oman is minimal, and that is the gap this current study is focused on filling. Nevertheless, many other studies do analyze this relationship and suggest many results. Mahmood et al. (2019) mentioned in their analysis that there is a profound association between trade openness and CO_2 emissions. Their study was limited to Tunisia and using a structured model; they suggested that higher emissions are determined by many factors and trade openness is one of them. Financial development is also expected to lead to higher pollution rates. The data used for the study of Tunisia was from 1971-2014, and the analysis suggested a mixed model of integration with both short and long-term relationships between the variables. For the country, a turning point for the GDP was 292.335 billion constant US dollar. It indicates that when the country of Tunisia reaches this level of GDP, the effects of trade openness on environmental degradation and CO_2 emissions start to reverse (Mahmood et al. 2018). Trade openness leads to higher energy consumption, which eventually affects the environment in a negative way (Alkhateeb and Mahmood 2019). In their study on the East Asian region, Mahmood et al. (2019) used 1991-2014 data for six East Asian countries and suggested the relationship and spatial effect of foreign direct investment and trade openness on CO_2 emissions. In the findings, the factors seemed to have a spatial and spillover effects on the neighboring countries which indicates how destructive trade openness and FDI can be for the environment and how it affects the entire region and not just the host country. With local foreign direct investment inflows affecting the neighboring countries and their environmental profiles, it raises the need for better environmental policies for the industrial and manufacturing sector and how the investment is being intensified in these countries.

In their analysis of the GCC region, Bekhet et al. (2017) mentioned that financial development of a country and the environment has a strong relationship. Considering Saudi Arabia, Oman, Qatar and Bahrain, the study concluded that economic growth could lead to a higher rate of CO_2 emissions, which eventually destructs the environment. This interrelationship of variables is backed by a causal association between financial development, production activities, GDP growth and higher energy consumption. For a longer-term, the association between energy consumption and CO_2 emissions is unidirectional, and an increasing trend of energy consumption turns out to be harmful to the environment. Many other studies, including Kim et al. (2019), Mahmood et al. (2018), Huang et al. (2008), Akbostanci et al. (2009) support these results.

Kim et al. (2019) agreed to the fact that the relationship between trade and environmental degradation is a controversial issue and there is a massive space for improvement in the way research is conducted on this topic.

Using panel data in a North-North, Nort-South, South-South and South-South context, they controlled for endogeneity and explored how trade leads to an increase in CO_2 emissions in the North while this effect was even more significant in Southern context. The existence of environmental Kuznets curve was tested, and they mentioned that in the developed countries, the degrading impact of trade on the environment is not as destructive as it is in the developing countries which increases the need for the developing countries to be more careful while it comes to adopting trade liberty. Akbostanci et al. (2009) conducted an analysis on Turkey to analyze how income and the environment are related there and the extent to which EKC exists there. The study was unique since it analyzed the effects on a panel and time series basis as well to explore the impact of the independent variables from 1968-2003. In both models, the impact of the economic activities and higher income was seen to be harmful on the environment, and the authors suggested that strong policy implications are required to drive the economies in a sustainable way without having to ruin the environment.

The global trade network has a substantial role in the environmental conditions across the world, and many studies provide that argument. In their analysis, Aller et al. (2015) argued that trade networks have become very important for countries, and it is up to them to decide how they want it to affect their environmental qualities. For developed countries, there is a direct impact of trade networks on the quality of the environment and this effect is indirect for developing nations. Nevertheless, the relationship between environment and trade networks of countries cannot be ignored. The trade networks are seen to affect the environment negatively, but in the developing countries, the effect is not as destructive. There is a need to expand this study and analyze why the developing countries are not affected as much as the developed ones. In a broader perspective, trade networks and policies can be used as a medium for countries to re-evaluate their environmental policies and trade agreements signed with other nations can play a strong role in keeping the environment into perspective (MacDermott and Bang 2018).

Looking at CO_2 emissions from a general perspective, there are many determinants of these emissions mentioned in the literature. The idea of CO_2 emissions is not as simple and is developed through a complex network of perspectives. It is mentioned by Jiang et al. (2019) that there are many driving factors for carbon emissions and trade is one of them. In that context, developing countries can play a role in reducing carbon emissions by getting involved in more sustainable trade relations with other nations. The results of the study align with what was mentioned by Aller et al. (2015) that in developing countries, the role of trade is constructive for the environment. According to Alam and Murad (2020), economic growth, trade openess and technological progress with the environmental sector and this association is even strong in the renewable energy segment of the country. There is a dire need for organization to generate opporunities of cooperation between the economic and environmental sector. Especially in the deveoping countries, this issue has more significance because these nations are supposed to focus on economic growth and a sustainable environment at the same time, which is harder to achieve in their capacity. The technological growth that takes place as a result of trade openness and economic growth, countries can use that in the renewable sector to invest activities that make the industry more advanced and environmentally friendly. In that way, the renewable industry can be given the support it requires to grow in the developing world. If that sustainability is maintained for a longer-term, developing countries can make economic progress by leaps and bounds and a bi-directional association can be established between both segments that can ensure long-term growth.

In France, trade openness and CO_2 emissions seem to have a positive relationship through 1960-2010. It was argued by Mutascu (2018) that through the selected period, there is an existence of a two-way relationship between the two and while trade openness might lead to emissions, higher emissions are also supposed to lead to higher trade openness in a country. For gas emissions, trade openness does not lead to a higher frequency compared to other emissions. From a broader perspective, the existence of a business cycle between trade openness and emissions is suggested in the study, which is a unique concept to consider. For countries focusing on lower emissions and an optimal productivity level in the country, environmental policies also focus on trade

openness and friction since they seem to put an impact on emission leakages and environmental policies as well (Holladay et al. 2018).

For companies being involved in international trade, it is crucial to ensure that the export and import that they are conducting is on the cleaner side of the manufacturing domain. That is something that can help companies, and eventually, countries promote international trade while still keeping the environment into focus. It is so because no matter how much economic growth has been sustained through trade and related activities, the destructive effects of the emissions through them also have a value associated to them which might even be higher than the value of the open trade. It eventually means that the net impact of free trade in many countries might be zero or even harmful if a holistic view is not taken into consideration (Forslid et al. 2018).

Trade, income inequality, emissions and economic developed are strongly connected, and as a country become financially more stable, and income rises with less income inequality, emissions can tend to decline. Through a panel data study, Hubler (2017) narrated that income inequality and emissions have a negative relationship, and higher income inequality can also lead to higher emissions that degrade the environment. Trade openness and carbon emissions have a strong relationship, and there is a turning point in a trade that countries need to keep into account to explore where does it start to affect the environment negatively. Using data from 105 countries from various income groups including low, middle and high, Shahbaz et al. (2017) argued that there is a role of trade openness in impeding the environmental quality in a broader scale regardless of the income scale a country falls within.

3. Methodology

Following the theoretical model of trade openness affecting the environment, the following model is hypothesized:

$$LCO_t = \alpha_0 + \alpha_1 LGDPC_t + \alpha_2 LTO_t + \varepsilon_t \tag{1}$$

All the variables in equation 1 are taken with their natural log (L). LCO_t is showing per capita CO_2 emissions, $LGDPC_t$ is per capita GDP, and LTO_t is percentage of trade to GDP. Data is used from 1972-2014 for Oman and more recent is not used due to reporting limitations. Data used in the analysis is sourced from World Development Indicators. It is expected that trade openness has a destructive impact on the CO_2 emissions, which means that higher trade openness would increase CO_2 emissions and affect the environment in a negative way. GPD per capita is also expected to have a positive impact on CO_2 emissions, which is essentially because higher GDP means higher production activities led by natural resource exploitation and higher emissions. Augmented Dickey and Fuller (ADF) test of Dickey and Fuller (1979) is conducted to check the stationarity as follows:

$$\Delta y_t = \beta_0 + \beta_1 y_{t-1} + \sum_{i=0}^{n} \beta_{2i} \Delta y_{t-i} + \psi_t \tag{2}$$

Where, the unit root will be tested on a null hypothesis of $\beta_1 = 0$ and its rejection will ensure stationarity of y_t. After testing it, we will proceed for ARDL model of Pesaran et al. (2001) to do impact analyses in the following way:

$$\Delta LCO_t = \phi_0 + \phi_1 LCO_{t-1} + \phi_2 LGDPC_{t-1} + \phi_3 LTO_{t-1} + \sum_{j=0}^{m} \varphi_{1j} \Delta LCO_{t-j}$$
$$+ \sum_{j=0}^{m} \varphi_{2j} \Delta LGDPC_{t-j} + \sum_{j=0}^{m} \varphi_{3j} \Delta LTO_{t-i} + \xi_t \tag{3}$$

Where, cointegration may be claimed if H_0: $\phi_1 = \phi_2 = \phi_3 = 0$ is rejected and then we may discuss the long and short effects from equation 3.

4. Data Analyses

ADF test is shown in table 1 shows, and it is seen that all variables are non-stationary at the level. After differencing, variables become stationary, so the level of integration is one, and we proceed for cointegration analysis.

Table 1. Unit Root Test

	Intercept	Intercept and Trend
LCO_t	-1.9648	-2.8167
$LGDPC_t$	-1.6247	-1.2766
LTO_t	-1.2882	-1.0677
ΔLCO_t	-4.6613***	-4.6682***
$\Delta LGDPC_t$	-5.5878***	-6.1984***
ΔLTO_t	-5.9167***	-6.4454***

Note: *** shows stationary at 1% level of significance
Souce: Authors calculation

Before moving to the cointegration, figure 1 reflects the co-movement of the hypothesized variables. Figure 1 corroborates the positive relationship among CO_2 emissions per capita, Trade openness and GDP per capita as variables have the co-movements in the same direction in most of sample years (Raw data is provided in Appendix).
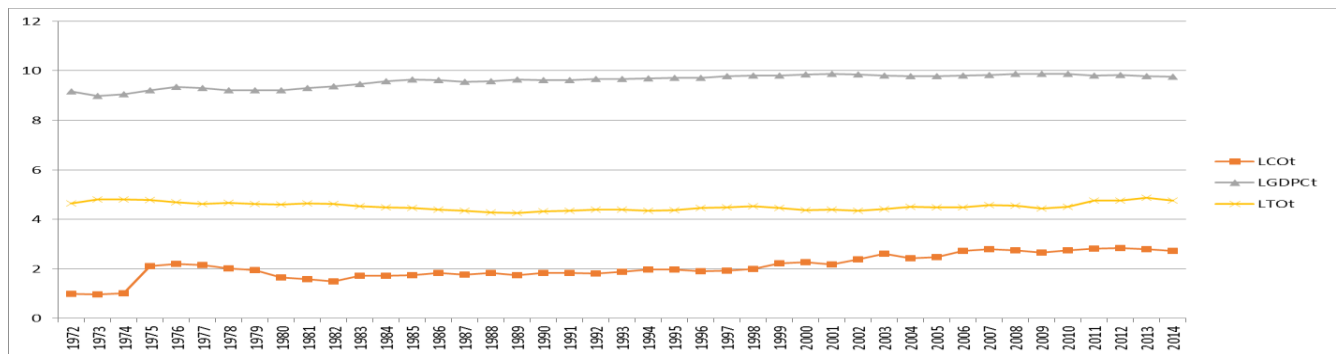
Figure 1. Trends of LCO_t, $LGDPC_t$ and LTO_t
Souce: World Bank (2019)

After the graphical analysis, table 2 shows the ARDL results with selected lag length (1,0,0). Diagnostic tests of heteroscedasticity, serial correlation and functional form show lower F-values along with reasonably high p-values and suggest that our estimated model is out of such econometric problems. The estimated F-value from the bound test is 3.6939, and it is larger than the critical value at 10% significance level. Therefore, it suggests that a long run relationship/cointegration exists in our estimated model.

Table 2. Nonlinear ARDL Estimates

Variable	Parameters	S.E.	t-Statistic	P-value
Long Run Results				

$LGDPC_t$	1.8031	0.3440	5.2407	0.0000
LTO_t	1.7038	0.5383	3.1652	0.0030
Intercept	-22.8525	4.9082	-4.6559	0.0000
Short Run Results				
$\Delta LGDPC_t$	0.6544	0.2145	3.0498	0.0042
ΔTO_t	0.6184	0.2371	2.6077	0.0130
ECT_{t-1}	-0.3629	0.0968	-3.7481	0.0006
Diagnostics				
Bound Test	Estimated F-value = 3.6939 Critical F-values At 5% 3.0836-3.8155 At 10% 2.6175-3.2969			
Heteroscedasticity	F-value = 0.0141		p-value = 0.9056	
Serial Correlation	F-value = 1.0287		p-value = 0.5979	
Functional Form	F-value = 0.0174		p-value = 0.8957	

Souce: Authors calculation

In the long-term results, there is a positive impact of GDP per capita on CO_2 emissions per capita. For CO2 emissions, income elasticity is found 1.8031, which greater than one. When GDP per capita increased by 1%, it has an accelerating effect of 1.8031 percent on CO_2 emissions. This result contradicts the insignificant effect found by Bekhat et al. (2017) for Oman. We conclude that increasing economic growth of Oman has negative environmental consequences by emitting the CO_2 emissions in the atmosphere. Further, there is a positive and significant effect of trade openness on CO_2 emissions. It means that increasing TO is responsible for environmental degradation and decreasing TO is helping in the protecting environment from CO_2 emissions. Further, estimated elasticity is found greater than one, and it suggests that one percent increase in TO is leading to increasing 1.7038 percent of CO_2 emissions. The effect of TO shows that increasing trade in Oman is responsible for higher CO_2 emissions in the atmosphere. Hence, both economic growth and TO lead to higher CO_2 emissions in the long-run, even CO_2 emissions are increasing at more than proportionate.

In the short-run results, coefficient of ECT_{t-1} suggests a short-run relationship in the estimated model with 0.3629 percent speed of convergence towards long run equilibrium. GDP per capita has again a positive effect on per capita CO_2 emissions in the short run though GDP per capita is positively contributing the CO_2 emissions with elasticity less than one. It indicates that even in the short-run, GDP per capita has a strong influence on the overall environment and its role in the development of the environmental profile of a country cannot be ignored. TO also has a positive and inelastic effect on the CO_2 emissions per capita in the short run. Though, the elasticity parameters suggest that CO_2 emissions are increasing less than proportionate but still both GDP per capita and TO lead to CO_2 emissions even in the short run. It puts light on the fact that even though the impact of both GDP per capita and trade openness is less than proportionate but it does not mean that the environment is not getting negatively affected and the impact is avoidable. In the longer-term, this effect will eventually hit the economy of Oman, and the results might even start to pile up against the financial and strategic strength of the country. Considering the global attention to the environment and reducing the carbon footprint, it is high time for this significant oil-exporting country to consider healthier and more sustainable options. More strategies can be developed to become environmentally more aware while being actively involved in open trade at the same time.

Conclusions

In the development of any country, TO plays a crucial part, but its environmental effect may not be ignored if the income of a country has been reached at a high point like the case of Oman. So, this present research investigates the impact of GDP per capita and TO on the CO_2 emissions per capita using ARDL methodology on a maximum available sample period of 1972-2014. Empirical findings suggest that GDP per capita and TO have a positive effect on per capita CO_2 emissions in the long run with an elasticity more significant than one. Therefore, increasing trade openness can have adverse environmental pressure due to higher CO_2 emissions and increasing economic growth has also negative environmental consequences. As a country becomes more advanced and its income increases, there is more focus on trade openness since the country is willing to achieve an optimal level of production and consumption as well. However, in that scenario, the destructive effects of this growth and especially trade openness cannot be ignored, and it should be kept into account that all the trade benefits come at a monetary and social price. With more trade growth, the negative impact on the CO2 emissions and the overall environment are more rigorous, which make the activities surrounding trade openness questionable.

Further, elasticities of both effects are found greater than one. Therefore, the increasing GDP per capita and TO have more than proportionate impact on CO_2 emissions. The same positive results of GDP per capita and TO are observed with elasticity lesser than one in the short run. Therefore, we suggest the government of Oman to draw the qualitative checks on the trade activities to support a clean environment in the country. At first glance, the monetary and diplomatic benefits that trade openness brings together are inevitable, but in a larger picture, its other social impacts of a qualitative must be taken into consideration as well since in the long-run, that is the most sustainable approach to development and prosperity. Many studies mentioned in the analysis suggest a more holistic view of the economy if a nation wants to achieve the goal of open trade and a sustainable environment at the same time. In a longer perspective, this idea puts together a better picture of the economy without exploiting one sector more than the other. In some studies, the existence of a spatial effect is also corroborated which indicates that higher income and trade openness is not only destructive for the environment of the host nation; it has destructive consequences for the neighboring countries as well which means that countries must try to be more inclusive when it comes to environmental policy formation since all nations share the same environment and air. Although the benefits of trade openness cannot be denied in an economic context of a country, the policies designed to improve it must be more inclusive of the entire economy, and all positive and negative externalities must be taken into consideration so that the net effect is positive.

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Apendix: Raw Data

Years	LCO_t	$LGDPC_t$	LTO_t
1972	0.990364	9.163808	4.635942
1973	0.962169	8.971383	4.812367
1974	1.020425	9.037821	4.79973
1975	2.107479	9.209899	4.772724
1976	2.194922	9.346526	4.684908
1977	2.163383	9.303662	4.628347
1978	2.021343	9.211311	4.673268
1979	1.956288	9.198114	4.622773
1980	1.65598	9.201031	4.608311
1981	1.595348	9.302668	4.632551
1982	1.491892	9.356752	4.622005
1983	1.710872	9.45734	4.518726
1984	1.728494	9.561739	4.475742
1985	1.754473	9.646849	4.46603
1986	1.844585	9.625637	4.384187
1987	1.765209	9.553726	4.356003
1988	1.84192	9.576326	4.267736
1989	1.754603	9.650602	4.248495
1990	1.837868	9.609328	4.315208
1991	1.827075	9.624245	4.354229
1992	1.806726	9.658851	4.385332
1993	1.870998	9.673708	4.395755
1994	1.963512	9.675565	4.353997
1995	1.975693	9.698659	4.376907
1996	1.909998	9.714079	4.449407
1997	1.92909	9.766821	4.484447
1998	1.995237	9.791968	4.518459
1999	2.217385	9.789369	4.457255
2000	2.267394	9.836193	4.376934
2001	2.179283	9.868297	4.394906
2002	2.389834	9.840164	4.344045
2003	2.608563	9.791512	4.413452

2004	2.437781	9.779713	4.502555
2005	2.476849	9.777467	4.492447
2006	2.729972	9.801635	4.47548
2007	2.797892	9.814783	4.569259
2008	2.739463	9.858082	4.560811
2009	2.65728	9.873473	4.445965
2010	2.746664	9.866875	4.497795
2011	2.814802	9.793334	4.753111
2012	2.837631	9.814679	4.761056
2013	2.805624	9.788655	4.863315
2014	2.737167	9.750747	4.748536

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PRODUCTION ACTIVITY CONTROL METHODS OF THE AGRICULTURAL ORGANIZATIONS[*]

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Abstract. At the present stage, the issues of information formation, its processing and use in management decision-making processes in the practice of commercial organizations are usually associated with the functioning of the controlling system. The subject of research is a system for controlling the production activities of organizations in the agricultural sector. In the economic literature, the management of production costs is called the main objective function of this system. The main scientific problem to solve is to study of methods of controlling production activities to improve the efficiency of managing the economic activities of the enterprise.The paper aims to suggest the application of regression analysis in relation to agricultural production in Russia as a whole, as well as in the framework of the crop and livestock industries. For the relevant indicators, taking into account the factors that influence them, the regression equations are compiled, its use is justified for analyzing the sensitivity of the resulting indicators to the dynamics of the factors taken into account, as well as for constructing economic forecasts, taking into account the dynamics of the development of factors that influence the studied indicator. The data obtained using such models can be used in the process of controlling the production activity of an agricultural enterprise for monitoring and analysis.

Keywords: controlling; production activity; regression analysis

1. Introduction

An urgent problem for entities operating within the framework of the modern economic system over the past decades is the need to deal with an ever-increasing flow of various data both on a quantitative and qualitative level, directly affecting the sphere of their interests. This trend is due to the development of material and production capacities, which open up more and more new opportunities for economic activity every year. Another

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reason for the growth of the information flow was the development of a market infrastructure that allows entrepreneurs to use the services of various counterparties and stakeholders in various fields at all stages of the life cycle and production activities of business entities from raising capital to bringing manufactured products to consumers. A significant role was also played by the appearance of ever new achievements in economic science and technology, allowing not only to take a fresh look at economic activity, but also to use new opportunities in the field of contractual relations. Finally, in recent years, the development of computing devices and interfaces, which completely changed both the possibilities in the field of information processing and the ways of working with information flows, the active introduction of which in everyday practice has been called digital transformation of the economy?

Business entities, on the one hand, are faced with the task of introducing the above-mentioned innovations into the practice of economics and management, since only in this way can they maintain their competitiveness in a changing world. On the other hand, this sets them the task of making or rejecting certain decisions and technologies, since errors along this path can lead to violations in the detail of enterprises and organizations, economic losses and even bankruptcy. An example of this is the incorrect definition of key success indicators (KPI), which can seriously complicate the fulfillment of the tasks set for the entrepreneurial structure or financial losses caused by the use of excessively risky investment strategies.

In the practice of managing commercial organizations at the present stage, the issues of the formation of information, its processing and use in management decision-making processes are connected with the functioning of the controlling system (Girdzijauskaite et al. 2019).

In contemporary scientific literature various facets of controlling are scrutinized (e.g. Bychkova et al. 2018; Nita 2018; Tengeh 2019; Masood et al. 2019).

2. Review of literature

In the course of the study of the controlling system, which was carried out as part of a non-systemic approach from the point of view of the theory of tetrads, an idea was formed of the controlling system as a combination of four types of subsystems:

1) the controlling environment in its various aspects: information, regulatory and organizational-technical, for which there are no spatial and temporal boundaries, that is, it exists throughout the existence of the organization, covering all aspects of its activities;

2) controlling processes, which include planning, monitoring, analysis, accounting and control processes - this subsystem is characterized by the presence of time boundaries in the absence of spatial boundaries, since each of the listed processes has a cyclic nature and must be completed in relation to each specific object, characterized by the achievement of definite results;

3) controlling objects covering various aspects of the organization's activities (having clear boundaries in its organizational structure): production, financial, investment, marketing activities, as well as activities in the field of personnel management, etc. These types of activities do not stop throughout the entire period of the organization's existence and, therefore, have no boundaries in time;

4) projects within the controlling system, which, as a rule, relate to a specific area of the organization's activity and have clear start and end dates and thus have boundaries both in space and in time.

The subject of this article is the subsystem for controlling the production activities of organizations in the agro-industrial complex sector. Within the framework of the classification of organization controlling subsystems under consideration, the production sphere should be identified as an object type system.

In the economic literature, production cost management is called the main objective function of this subsystem (Karminsky et al. 2013). Controlling tools in the manufacturing sector include deviation analysis, in which actual costs are compared with planned, as well as limiting deviations; analysis of capacity utilization, search for bottlenecks, as well as factor analysis, etc.

The Russian economic literature describes several different approaches to the processing and interpretation of data for the purpose of controlling the organization's production activities. V.V. Berdnikov in 2009 proposed the use of the distance method that allows one to take into account the degree of deviation of the absolute values of the indicators of an economic entity from the values of the best enterprise according to the estimated indicator.

The nature of the relationship between the cost of a unit of production and the cost of individual factors forming the costs of on-farm and external origin is interpreted in the form of an equation (Berdnikov 2009):

$$Cost = a_0 + \Sigma a_i * x_i + \Sigma b_i * y_i, \text{ where:}$$

Cost – production cost per unit of output

a_0 – free term of the correlation-regression equation

a_i – regression coefficients for factors of on-farm origin

x_i – factors whose value is formed within the enterprise

b_j – regression coefficients for factors of external (mainly industrial) origin;

y_i – factors of external origin.

Regression indicators are calculated by statistical processing of information arrays. It is proposed to use the obtained relationships for short-term forecasting of the movement in the cost of livestock production with changes in the cost of a unit of factors.

Similarly, the use of a composite multivariate regression model to determine performance indicators in a controlling system was proposed by M.N. Pavlenkov and illustrated him on the example of the study of planned and actual indicators of the cost of production activities. The use of this technique, according to the author, is able to solve problems in an interfunctional controlling system to increase the validity of plans, study the effectiveness of indicators, analyze deviations of planned and actual indicators, study the effectiveness of managerial decisions and forecast indicators (Pavlenkov 2007).

Similar methods in relation to the cost of agricultural products are offered by researchers of the Kuban State Agrarian University, studying promising mathematical and instrumental methods of controlling (Orlov et al. 2015; Shelyag, Lutsenko 2009, etc.). In the articles of these researchers, the use of controlling methods of automated structural and cognitive analysis, based on the Eidos universal cognitive analytical system developed by this group of scientists, is proposed. Using this system, all stages of this type of analysis are implemented: cognitive structuring of the subject area, its formalization by constructing classification and descriptive scales and gradations that connect factors with the resulting indicators and the preparation of a training sample, the synthesis

of a system of domain models, the assessment of reliability and improving the quality of the system domain models, solving problems of identification, forecasting and decision support, as well as the study of a simulated object that one.

The application of structural-cognitive analysis methods in controlling has been substantiated (Orlov et al. 2015), its application has been tested in relation to cost analysis in the production activities of agricultural enterprises (Krokhmal 2004, Shelyag, Lutsenko 2009). In studies on the management of production volumes in the agricultural sector based on the cost structure by the above authors, we also used the method of finding the regression equations of cognitive functions of the dependence of agricultural production on the share of costs of various kinds in the total cost structure. It should be noted that these studies were carried out on the basis of the region, however, in our opinion, it is possible to apply them to individual organizations or holdings.

3. Materials and methods

Thus, within the framework of all the approaches considered, the use of regression analysis as one of the methods of controlling production activity was justified. Speaking about the effectiveness of controlling in agricultural production, it is advisable to consider it from the standpoint of a certain system of indicators used in the monitoring of this type of activity. We illustrate the application of this method, operating with data at the macroeconomic level.

V.V. Berdnikov (2012) identifies performance indicators depending on the specialization of agricultural production. For livestock, he distinguishes:
- the productivity of farm animals, determined by the ratio of the mass of products to the average annual number of animals;
- feed conversion ratio, calculated as the ratio of product mass to the number of feed units;

For crop production V.V. Berdnikov highlights:
- crop yields per hectare of crops;
- the conversion rate of mineral fertilizers, defined as the ratio of the mass of crop production to the mass of the active substance.

Moreover, for both segments they are allocated such performance indicators as the ratio of sales to the average number of employees, return on sales and return on current assets.

In practice, access to these indicators for an individual enterprise or group of enterprises may be difficult, but it seems promising to consider these factors at the macro level. In the table 1 shows the relevant indicators characterizing various aspects of agricultural production in the Russian Federation. Based on the data presented in the table, it seems possible to conduct a regression analysis of agricultural production as a whole, as well as within the framework of crop and livestock industries, expressed in the value of the output.

During the regression analysis of the data presented, the following equations were compiled:
1) for agricultural production in general:

$$P_{ac} = 1297{,}15 + 3{,}66 * a_1 + 12{,}34 * a_2 + 8{,}91 * a_3,$$

where P_{ac} – agricultural production, billion rubles;
a_1 – the ratio of the volume of production to the average number of employees, thousand rubles for 1 person.;

a_2 – profitability of agricultural products sold, %;

a_3 – return on assets of agricultural organizations, %.

Table 1. Indicators characterizing the efficiency of agricultural productionin agricultural organizations of the Russian Federation

Indicator	Period, years								Growth rate 2018 г. to 2011 г., %
	2011	2012	2013	2014	2015	2016	2017	2018	
Agricultural production, billion rubles	3098,7	3160,3	3458,3	4031,1	4794,6	5112,3	5109,5	5119,8	165,22
Crop production, billion rubles	1566,7	1491,6	1730,2	1986,7	2487,3	2710,3	2599,7	2569,0	163,98
Livestock production, billion rubles	1532,0	1668,7	1728,1	2044,4	2307,3	2402,0	2509,8	2550,8	166,50
The ratio of the volume of production to the average number of employees, thousand rubles for 1 person	472,00	488,68	543,42	645,29	884,94	951,30	1006,90	-	-
Profitability of agricultural products sold, %	9,1	10,6	5,5	15,7	20,2	15,7	13,2	12,3	135,16
Return on assets of agricultural organizations, %	3,9	3,5	1,7	4,9	6,9	6,8	4,3	6,4	164,10
Milk yield per 1 cow, kg	4306	4521	4519	4841	5140	5370	5660	5945	138,06
Average egg production of 1 laying hen, pieces	308	306	305	308	310	308	311	305	99,03
Average shear of wool from 1 sheep, kg	2,2	2,3	2,3	2,4	2,3	2,2	2,2	2,6	118,18
Feed consumption for livestock and poultry per 1 conditional head of cattle, c	28,25	28,76	27,95	29,19	28,65	28,93	28,57	28,33	100,28
Productivity of grain and leguminous crops, c /ha	23,3	19,3	23,1	25,4	25	27,6	31	27,2	116,74
Potato yield, c/ha	196	181,7	197,5	207,4	233,5	226,2	258,3	255,6	130,41
Conversion rate of mineral fertilizers for grain and leguminous crops	0,555	0,483	0,578	0,605	0,556	0,541	0,534	0,4533	81,68
The conversion rate of mineral fertilizers for potatoes	0,703	0,745	0,737	0,678	0,712	0,694	0,73	0,652	92,75

Source: Federal state statistics service. 2019; Unified interdepartmental information and statistical system (EMISS). 2019

2) for livestock production:

$$P_a = 0{,}65*c_1+20{,}87*c_2-54{,}34*c_3+94{,}77*c_4-10162{,}67,$$

where P_a – livestock production, billion rubles.;

c_1 – milk yield per 1 cow, kg;

c_2 – average egg production of 1 laying hen, pieces;
c_3 – average shear of wool from 1 sheep, kg;

c_4 – feed consumption for cattle and poultry per 1 conditional head of cattle, c.

3) for crop production:

$$P_c = 21{,}36*b_1+13{,}58*b_2+587{,}27*b_3-878{,}93*b_4-1072{,}84,$$

where P_c – crop production, billion rubles;

b_1 – the yield of grain and leguminous crops, centners per hectare;

b_2 – yield of potatoes, centners per hectare;

b_3 – conversion rate of mineral fertilizers for grain and leguminous crops;

b_4 – the conversion rate of mineral fertilizers for potatoes.

At the same time, for the production of agricultural products, the correlation coefficient characterizing the level of connection is 0.9889 for this equation, which indicates a very high dependence of the data, while the high value of the Fisher test indicates the reliability of the relationship between the factors under consideration and the result. In relation to livestock products, the value of the correlation coefficient is 0.9711, indicating an even higher level of communication, and the value of the F-criterion allows us to conclude that the regression is significant.

For crop production, however, with a rather high correlation coefficient (0.8331), the value of the F-criterion does not allow us to conclude that the relationship is significant. It seems that this is due to the limited number of crop production sectors considered in the model: unfortunately, the available statistical data do not allow calculating the conversion rates of mineral fertilizers for some other crops.

The obtained equations can be used both for forecasting agricultural production volumes and for sensitivity analysis.

4. Results and discussion

Table 2 shows the data characterizing the sensitivity of agricultural production in relation to the selected factors. It is shown how ten percent growth of each of the considered factors will affect the resulting indicators: the volume of agricultural production in Russia as a whole, crop production and livestock production.As the data in the table show, agricultural production is most affected by the indicator of the ratio of the volume of production to the average annual number of employees, which characterizes, in fact, labor productivity. Profitability ratios for sales of agricultural products, and especially the return on assets of enterprises operating in the industry, have a significantly smaller impact. Among the factors considered as influencing the volume of livestock production, the most significant indicator is the efficiency in egg production, and the least significant is in wool production.

The data obtained in relation to the influence of selected factors in relation to crop production confirm the hypothesis of the unreliability of the regression model under consideration, since the assumption that growth in yield in potato production has a greater influence on crop production than growth in cereal and leguminous crops does not seem appropriate reality.

Table 2. Sensitivity analysis of agricultural production in the Russian Federation

With an increase of 10%:	Change in the volume of agricultural production,%
the ratio of the volume of production to the average number of employees, thousand rubles for 1 person	7,11
profitability of agricultural products sold,%	0,31
return on assets of agricultural organizations,%	0,07
With an increase of 10%:	Change in the volume of livestock production,%
milk yield per 1 cow, kg	14,85
medium egg laying 1 laying hens, pieces	24,62
average shear of wool from 1 sheep, kg	-0,55
feed consumption for livestock and poultry per 1 conditional head of cattle, c	10,39
With an increase of 10%:	The change in the volume of crop production,%
yields of grain and leguminous crops, kg / ha	2,17
yield of potatoes, c / ha	12,99
the conversion ratio of mineral fertilizers for grain and leguminous crops	1,00
the conversion rate of mineral fertilizers for potatoes	-2,14

Source: Authors' calculations

To forecast the value of production in the agricultural industry on the basis of the available data, it is possible, by calculating the forecast value for each factor, to determine the results, as shown in table. 3 and 4, which presents the corresponding forecast values for agricultural production and livestock production.

Table 3. Forecast of agricultural production in agricultural organizations of the Russian Federation

Indicator	Linear trend equation	Forecast value for 2019
The ratio of production to the average number of employees (A1), thousand rubles for 1 person	$y = 102{,}5521a_1 + 303{,}01$	1225,98
Profitability of agricultural products sold (a_2), %	$y = 1{,}3286a_2 + 7{,}5429$	19,50
Return on assets of agricultural organizations (a_3) %	$y = 0{,}4643a_3 + 2{,}7143$	6,89
Agricultural production (Pac), billion rubles.	$P_{ac} = 1297{,}15 + 3{,}66 \ast a_1 + 12{,}34 \ast a_2 + 8{,}91 \ast a_3$	6090,31
	$P_{ac} = 352{,}61t + 2648{,}83$	5822,32

Source: Authors' calculations

For crop production, due to the established inaccuracy of the calculated model, determining the forecast value does not seem to make sense.

The practical significance of the calculated forecast can be determined by comparing the forecast value calculated using the presented regression model with the forecast value calculated on the basis of the linear regression equation, calculated independently for the resulting indicator.

Table 4. Forecast of livestock production of agricultural organizations of the Russian Federation

Indicator	Linear trend equation	Forecast value for 2019
Milk yield per 1 cow (c_1), kg	$y = 238{,}3333c_1 + 3965{,}25$	6110,25
Average egg production of 1 laying hen (c_2), pieces	$y = 0{,}1786c_2 + 306{,}8214$	308,43
Medium wool cut with 1 sheep (c_3), kg	$y = 0{,}0226c_3 + 2{,}2107$	2,41
Feed consumption for livestock and poultry per 1 conditional head of cattle (c_4), c	$y = 0{,}0239c_4 + 28{,}4711$	28,69
Livestock Production (Pa), billion rubles	$P_a = 0{,}65{*}c1 + 20{,}87{*}c2 - 54{,}34{*}c3 + 94{,}77{*}c4 - 10162{,}67$	2806,94
	$P_a = 162{,}16t + 1363{,}15$	2822,62

Source: Authors' calculations

If in the forecast of livestock production between these values there was no significant difference, then for the production of agricultural products as a whole, such a difference seems noticeable. This difference is clearly illustrated in Fig. 1
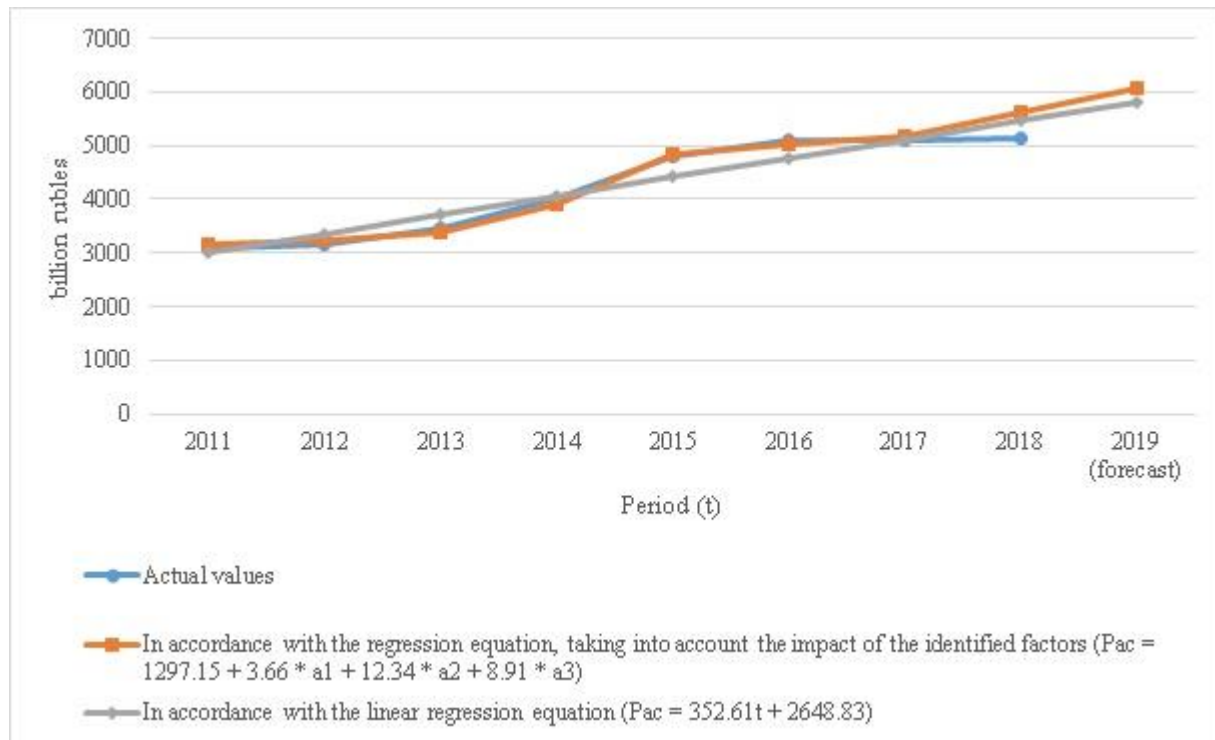
Fig.1. Agricultural production indicators
Source: Authors' calculations

In our opinion, the difference is due to the fact that a certain regression model allows you to take into account existing trends in the dynamics of factors that affect the resulting indicator. Thus, the more optimistic forecast

results for agricultural production obtained using the regression model take into account primarily the growth potential of production per employee.

Conclusions

Thus, a number of conclusions can be drawn from the results of the study. Within the four-link structure used to describe the system of controlling agricultural enterprises, the control of production activity is a subsystem of the object type that has limitations in space, but not in time.

A study of the works showed that a promising method for studying the production activities of enterprises engaged in agricultural production is the use of regression models. The data obtained using these models can be used in the process of controlling the production activity of an agricultural enterprise for monitoring and analysis, and as a result, for making informed management decisions.

In accordance with the existing ideas about the efficiency of agricultural production, an experiment was conducted to build regression models describing the production of agricultural products in general, as well as products of the livestock and crop production sectors, taking into account the impact on them of selected performance indicators characterizing the relevant industries. The study showed the effectiveness of using such models along with well-known limitations in their application regarding the need to identify factors that influence the resulting indicator and control the reliability of the identified relationships, both on the basis of statistical criteria and on the level of compliance of the results of applying the model to the real situation.

The use of regression models is justified for analyzing the sensitivity of the resulting indicators to the dynamics of the factors taken into account, allowing us to draw conclusions about the stability and risks in production, as well as to build economic forecasts that take into account the dynamics of the development of factors that influence the studied indicator.

The use of regression models is justified not only at the macro level. They can also be used at the level of individual enterprises or their associations, where their application is advisable primarily in relation to production costs as part of a system of controlling production activities. At the same time, at this level, their application requires a large amount of specific data on the activities of organizations, which sets the task of harmoniously building a monitoring system and internal management accounting of agricultural producers.

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METHODOLOGY OF COMPLEX ANALYSIS OF TANGIBLE FIXED ASSETS

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Abstract. Tangible fixed assets are used in production, provision of services, renting and for administrative purposes. Various internal and external information users are interested in this type of assets. With regards to the significance of such assets, it is very important to carry out their detailed analysis. The article recommends a methodology of complex analysis of tangible fixed assets that consists of the following stages: 1) compositional analysis; 2) structural and dynamic analysis; 3) change analysis; 4) technical condition analysis; 5) usage analysis; 6) profitability analysis. Application of this methodology allows one to objectively assess the condition of the tangible fixed assets and make management decisions in order to use them better and improve the enterprise's activity results.

Keywords: tangible fixed assets analysis; compositional analysis; structural and dynamic analysis; change analysis; technical condition analysis; usage analysis; profitability analysis

1. Introduction

Tangible fixed assets are one of the most important financial indicators describing the financial state and activity results of an enterprise. Other financial indicators, continuity of the enterprise's activity, perspectives and even a possibility of a bankruptcy depend on tangible fixed assets usage effectiveness. Therefore not only managers and employees, but also many external information users, especially investors, banks, insurance companies, tax authorities, economics experts, etc., are very interested in their composition, structure, technical condition. With regards to the significance of tangible fixed assets, it is very important to carry out its analysis. However, there is a lack of literature on the tangible fixed assets analysis. Many foreign and Lithuanian authors have analysed the issues of tangible fixed assets valuation and accounting in detail. Special emphasis is put on determination of the tangible fixed assets acquisition (production) cost, accounting policy development and application of depreciation methods (Juočiūnienė and Stončiuvienė, 2008; Lakis, et al., 2009; Black, 2004; Jackson, Rodger and Tuttler, 2010; Mykolaitienė, et al., 2010; Subačienė and Jakubauskaitė, 2012; Stungurienė and Christauskas, 2013; Kamarauskienė and Subačienė, 2013; Zinkevičienė and Vaišnoraitė, 2014; Liapis and Kantianis, 2015; Del

Giudice, Manganelli and De Paola, 2016; Legenzova, Gaigalienė and Vilkaitė, 2016; Matei, Țole and Stroe, 2017; Kanapickienė, Stankevičiūtė and Grebliunė, 2019; Hilkevics and Semakina, 2019 and others). Whereas a methodology of complex analysis of tangible fixed assets has not been analysed profoundly enough. Savickaja (Savickaja, 2005), Plenborg and Petersen (2011), Subačienė and Senkus (2012), Gibson, (2012), Mackevičius, Subačienė and Senkus (2012), Kovalev (Kovaliov, 2013), Mackevičius, Giriūnas and Valkauskas (2014), Kanapickienė and Grundienė (2015), Bragg (2017) have some specific suggestions on such an analysis. Yet the aforementioned authors usually limit themselves to studying only a certain aspect of a tangible fixed assets analysis. Whereas a consistent, complex methodology for tangible fixed assets analysis has not been created yet.

The object of the research is the complex analysis of tangible fixed assets in business enterprises'.

The aim of the article is to prepare a methodology of complex analysis of tangible fixed assets which would help managers to make right decisions, to use the assets effectively and bring economic benefit to the enterprise.

The research methods are the analysis of scientific literature, collection, comparison, classification and generalization of information, secondary statistical analysis.

The sources of the research are scientific publications by Lithuanian and foreign authors, Business accounting standards, data from the Statistics Lithuania.

2. Significance, characteristics and structure of tangible fixed assets

Tangible fixed assets are a type of assets aimed at producing goods, providing services, renting and for administrative purposes and are intended to be used for a period longer than one year, and the acquisition (production) cost of which is equal to at least the minimum cost of tangible fixed assets set by the entity (12th Business Accounting Standard, 2016). All enterprises, regardless of their size and activity type, have and use tangible fixed assets. Most authors studying the issues of the tangible fixed assets note that this type of assets is very significant for the financial state of an enterprise and its activity results and even in predicting bankruptcy (Păvăloaia, 2013; Bauer, 2014; Zinkevičienė, Stončiuvienė and Martirosianienė, 2016; Mert and Erkiran Dil, 2016 and others). Tangible fixed assets of different enterprises may vary significantly and their role in an enterprise may be active or passive. And some assets may be rented for other enterprises or not used at all, etc. However, most of tangible fixed assets have an active role in the creation of material wealth and have a direct impact on the enterprise's activity results.

Tangible fixed assets, compared with current assets, have certain unique characteristics: 1) acquirement of tangible fixed assets is always very significant since the price of a unit is usually high (it is very important to check acquirement of fixed assets, yet the larger a unit of this type of assets, the easier it is to check it); 2) an enterprise uses tangible fixed assets for several years and throughout this period they are registered in the enterprise's accounting documents (an error in the accounting documents and registers will remain for the future periods as well); 3) the turnover of tangible fixed assets is much slower than that of current assets (after checking the tangible fixed assets movement operations once, next time only some of the operations may need to be checked); 4) security systems of tangible fixed assets are not as strict as that of current assets (due to the physical characteristics, it is much more difficult or even impossible to steal fixed assets thus it is easier to check the presence of this type of assets); 5) estimation of the depreciation of tangible fixed assets using different methods influences the enterprise's activity results.

Tangible fixed assets usually represent the largest comparative part of all the assets of an enterprise. In 2017, tangible fixed assets of Lithuanian enterprises engaged in all economic activities (except for agriculture, financial

intermediation, public administration and defence) accounted for 29,033 million EUR and had increased by 2.53% compared with the year 2013 (see Table 1).

Table 1. The part of tangible fixed assets compared with all assets and fixed assets in the period from 2013 to 2017

Indicators	2013	2014	2015	2016	2017
1. Total number of enterprises	60,706	67,673	71,445	73,941	74,730
2. Assets, total (millions of EUR)	66,907	67,929	71,679	76,168	78,466
3. Fixed assets (millions of EUR)	42,785	42,701	44,720	47,371	46,819
4. Fixed tangible assets (millions of EUR)	28,317	27,735	28,997	30,188	29,033
5. The part of tangible fixed assets (%) compared to:					
a) all assets	42.3	40.8	40.5	39.6	37.0
b) fixed assets	66.2	65.0	64.8	63.7	62.0
6. The change rate of tangible fixed assets compared to 2013 (%)	0.0	-2.06	2.4	6.60	2.53
7. The average amount of tangible fixed assets for one enterprise (millions of EUR)	0.47	0.41	0.41	0.41	0.39

Source: compiled by the authors based on Verslo įmonių statistika 2017 [Business Statistics, 2017]. Vilnius: Statistics Lithuania, 2018, p. 18

Table 1 makes it clear that tangible fixed assets account for a rather large part of all assets (42.3% in 2013, 37.0% in 2017) and of fixed assets (respectively 66.2% and 62.0%). On average, every Lithuanian business enterprise has around 0.4 million EUR worth of tangible fixed assets.

Tangible fixed assets are registered and systematized in financial accounting based on the following categories: uncompleted construction, land, non-residential buildings, residential buildings, construction, machinery and equipment, vehicles and other means of transport, other equipment, instrumentation, tools and installations. In 2017, the following categories accounted for the largest comparative part: non-residential buildings (31.6%), construction (20.9%) as well as machinery and equipment (15.3%) (see Table 2). Yet it does not mean that other categories of tangible fixed assets are less significant: they also have an active role in the processes of production and service provision.

Table 2. Structure of tangible fixed assets, 2017

Types of tangible fixed assets	Percentage
1. Non-residential buildings	31.6
2. Construction	20.9
3. Machinery and equipment	15.3
4. Vehicles and other means of transport	11.5
5. Other equipment, instrumentation, tools and installations	7.6
6. Land	6.2
7. Uncompleted construction	5.3
8. Residential buildings	1.6
Total	100.0

Source: compiled by the authors based on Verslo įmonių statistika 2017 [Business Statistics, 2017]. Vilnius: Statistics Lithuania, 2018, p. 19

Tangible fixed assets are used in enterprises from all types of economic activities. In 2017, the largest part of this type of assets was used in real estate activities (6,538 million or 22.52%), transportation and storage (5,107 million or 17.59%) and manufacturing (4,535 million or 15.62%) (see Table 3). Even though tangible fixed assets accounted for a rather small part of such types of economic activities as education, repair of computers and personal and household goods, other personal service activities, arts, entertainment and recreation, human health

and social work activities, mining and quarrying, they were necessary for production of goods, provision of services, rent or administrative purposes.

Table 3. Tangible fixed assets by economic activity types, 2017

Economic activity	millions of EUR	Percentage
1. Real estate activities	6,538	22.5
2. Transportation and storage	5,107	17.6
3. Manufacturing	4,535	15.6
4. Electricity, gas, steam and air conditioning supply	3,564	12.3
5. Wholesale and retail trade, repair of motor vehicles and motorcycles	2,677	9.2
6. Water supply; sewerage, waste management and remediation activities	1,758	6.1
7. Administrative and support activities	1,099	3.8
8. Construction	1,068	3.7
9. Information and communication	673	2.3
10. Professional, scientific and technical activities	640	2.2
Other activities	1,374	4.7
Total	29,033	100.0

Source: compiled by the authors based on Verslo įmonių statistika 2017 [Business Statistics, 2017]. Vilnius: Statistics Lithuania, 2018, p. 19

In today's dynamic and very competitive business environment, managers raise reasonable concerns about how much and what type of tangible fixed assets they should have, what their technical condition should be, and how can they use these assets effectively in order to achieve good financial results for the enterprise, to continue its activities and to produce high-quality and competitive products. In order to answer these questions, a complex analysis of this type of assets is required. However, before carrying out a complex analysis of tangible fixed assets, first one needs to make sure whether certain assets were attribute to the category of tangible fixed assets reasonably.

Business Accounting Standard 12 on Tangible fixed assets lists five characteristics based on which tangible assets shall be attributed to the category of fixed assets: 1) the entity expects to use it for a period longer than a year; 2) the entity reasonably expects a flow of economic benefits from this type of assets in future periods; 3) the entity can reliably measure the acquisition (production) cost of the assets; 4) the acquisition (production) cost of the assets exceeds the minimum cost of a tangible fixed assets unit set by the entity for each category of assets; 5) the risk related to tangible assets has been transferred to the entity (12th Business Accounting Standard, 2016).

It must be noted that if an enterprise uses a unit of assets for more than a year yet its value is lower than the minimum threshold set by the enterprise for the category of assets or total amount of assets, then the assets should not be regarded as tangible fixed assets. Tangible assets that allow the enterprise to carry out its activities in future periods yet bring no direct economic benefits are regarded as fixed assets. After making sure that a certain type of assets has been reasonably assigned to the category of tangible assets, then the goals of the analysis have to be established, the right sources for the analysis have to be chosen and its consistency has to be ensured.

3. Recommended methodology for the tangible fixed assets complex analysis

The main sources of tangible fixed assets analysis are balance sheet, statement of profit and loss, other financial reports and information provided by the following ledger accounts: Land, Buildings and construction, Plant and machinery, Vehicles, etc. Also, when carrying out the analysis, the lists of tangible fixed assets based on their location, inventory descriptions, statements of depreciation estimation and primary and consolidated documents are used.

The complex analysis of tangible fixed assets has to be carried out consistently and in certain stages. However, before starting such an analysis, it is important to assess, whether certain assets were assigned to the category of tangible fixed assets correctly (see Fig. 1).
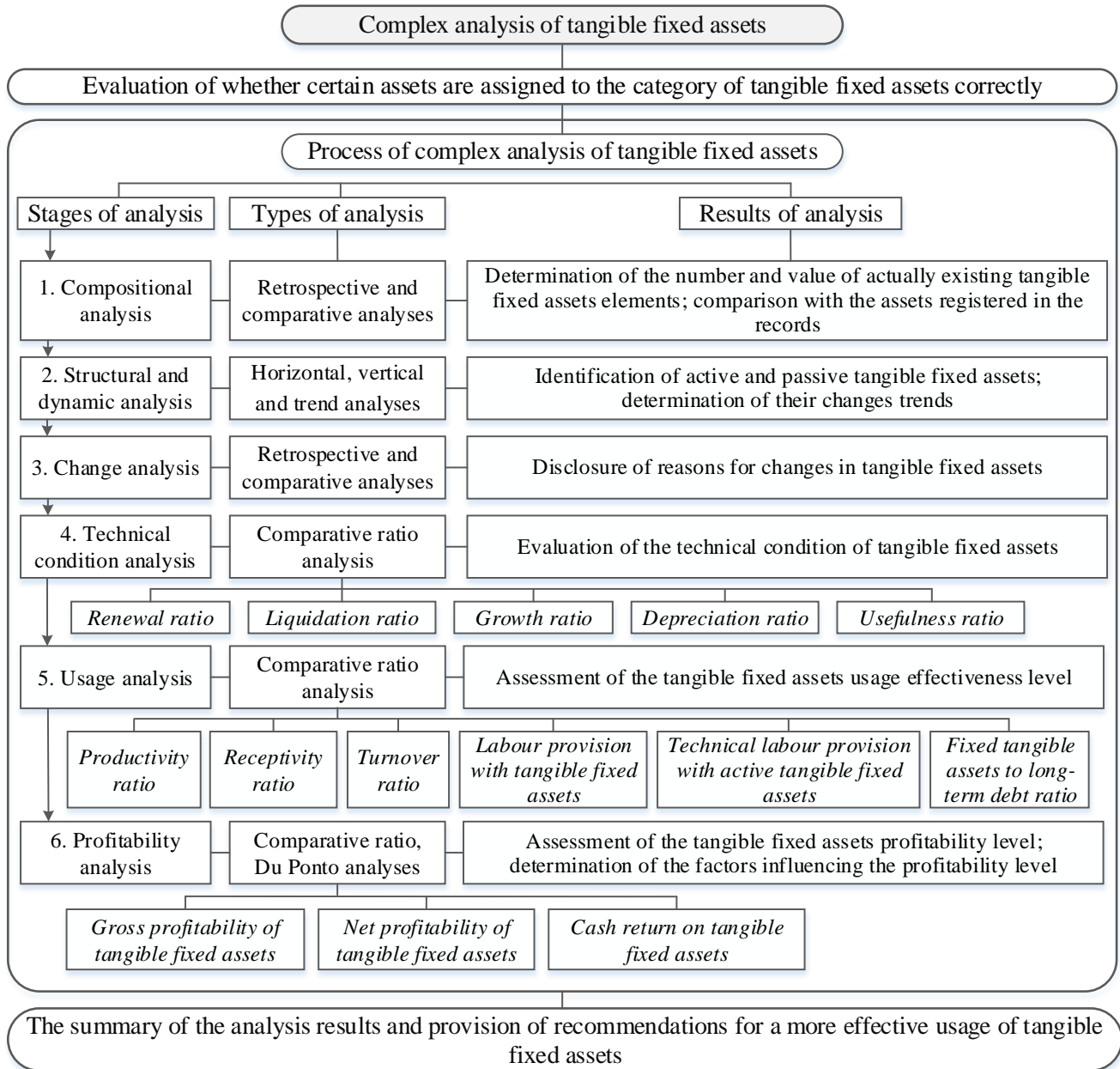
Figure 1. Methodology of complex analysis of tangible fixed assets

The Figure 1 makes it clear that 6 main stages of tangible fixed assets analysis are distinguished. It is important to choose the type of analysis at every stage of analysis and distinguish the most important things to focus on, i.e. to determine the results of analysis. The complex tangible fixed assets analysis is completed by summarizing the results and providing recommendations on how to use the assets more effectively.

Compositional analysis. When carrying out the compositional analysis of tangible fixed assets, it is important to establish whether the tangible assets with indicated composition actually exist and whether there are no unregistered assets. Accountants should apply the same classification for tangible fixed assets composition and not change it too often – this is very important. An analyst ought to make sure whether the enterprise owns the tangible fixed assets mentioned in the accounting documents and registers.

Tangible fixed assets may be very valuable, the price of a unit may be very high. Also, an enterprise might use the assets of this type for many years. Therefore it is important to determine whether management pays enough attention to maintain and protect such assets. An analyst, analysing the tangible fixed assets composition, must also analyse the enterprise's liabilities, i.e. to determine whether the enterprise is able to pay its debts for the bank and suppliers in tangible fixed assets.

Structural and dynamic analysis. When conducting a structural and dynamic analysis of tangible fixed assets, horizontal, vertical and trend analyses are used. During the analysis it is appropriate to estimate what part of all tangible fixed assets do active assets account for and to determine their development trends during a certain period. If in the presence of other constant factors the part of active assets is increasing, it can be concluded that the enterprise's production capacity is increasing as well. Yet it should be noted that the increase in the active part of the assets is not always an objective indicator of the increase in the enterprise's production capacity because of chosen assessment of such assets and depreciation methods. It is also important to determine whether the active part of the tangible fixed assets is technically advanced. Determination of the optimum ratio of the active and passive (that are not directly involved in the production and services provision process) assets is an important condition for using the assets effectively. Therefore all the elements of tangible fixed assets have to be estimated and reasons for their development have to be analysed.

Practice shows that the elements of tangible fixed assets vary differently. Thus it is important to conduct the analysis of not only all tangible fixed assets but of the dynamics of all its elements. The information of this analysis is especially significant if a longer period is analysed. It is related to the fact that some fixed assets are rarely renewed because they can be used for a long time. Active elements of tangible fixed assets should be renewed more often, however, as the practice shows, in some cases the passive part of the assets increases faster. When analysing the structure and dynamics of the tangible fixed assets, it is important to focus on one significant factor – the same elements have to be included into the active and passive parts of the assets every year. In other cases the data will be impossible to compare.

Change analysis. The change analysis of tangible fixed assets has to be related to the compositional, structural, and dynamic analyses since variation of any assets element has an impact on the general results of assets composition, structure and dynamics. During the tangible fixed assets change analysis the following things have to be determined: 1) how much and what type of assets there were at the beginning of the accounting year, what is the cost of acquirement (production) of such assets; 2) how much and what type of assets were acquired during the accounting year, what is the cost of acquirement of such assets; 3) how much and what type of assets were produced or constructed by the enterprise itself, how much of it was transferred to others, devaluated, revaluated or written-down; 4) how much and what type of assets there were left at the end of the accounting year.

Tangible fixed assets change analysis has to be conducted on the basis of the most important elements of such assets. It is important to determine the reasons due to which material changes in certain elements took place. Often the change of tangible fixed assets is influenced by the enterprise's reconstruction, division or merging, changes in organizational structure and management system, improvement of production processes and forms of work organisations; renewal of depreciated and obsolete assets; the level of production specialization and cooperation; changing of the enterprise's geographical location, etc.

Technical condition analysis. The enterprise's financial state and activity results are very dependant on the technical condition of tangible fixed assets. However there is an issue of evaluating the technical condition of such assets because tangible fixed assets can be very different depending on the types of enterprises' activities since their technical and usage characteristics, useful life, etc. are different. Therefore during the tangible fixed assets technical condition analysis, one must look for the most general indicators that can be compared in an enterprise during a longer period as well as with the indicators of related enterprises. The most general indicators describing the technical condition of tangible fixed assets are as follows: 1) renewal; 2) liquidation; 3) growth; 4) depreciation; 5) usefulness. Formulae for their calculations as well as their descriptions are provided in the Table 4. All these indicators may be calculated both for all tangible fixed assets in general and for the separate types of assets.

Table 4. Indicators describing the technical condition of tangible fixed assets

Indicators	Formulae for their calculation	Description of the indicators
1. Tangible fixed assets renewal ratio	$$\dfrac{\textit{Tangible fixed assets acquired during the year}}{\textit{Tangible fixed assets at the end of the year}}$$	This indicators shows what part do the newly acquired tangible fixed assets account for in the total acquisition value of all tangible fixed assets. The increase of active assets renewal ratio is considered favourable. It reveals the enterprise's potential in increasing the production capabilities and developing business
2. Tangible fixed assets liquidation ratio	$$\dfrac{\textit{Tangible fixed assets liquidated during the year}}{\textit{Tangible fixed assets at the beginning of the year}}$$	From this ratio one can make conclusions about the maintenance and usage of tangible fixed assets and even on production capacities. If the ratio has increased it can also mean that production capacities have decreased, that work is irregular, etc.
3. Tangible fixed assets growth ratio	$$\dfrac{\begin{array}{c}\textit{Tangible fixed assets at the end of the year}\\ -\textit{ Tangible fixed assets at the beginning of the year}\end{array}}{\textit{Tangible fixed assets at the beginning of the year}}$$	This indicator shows the trends of changes in tangible fixed assets. If the indicator increases, it is considered as positive thing because it shows that the enterprise takes care of production development, invests into tangible fixed assets
4. Tangible fixed assets depreciation ratio	a) depreciation ratio at the beginning of the year: $$\dfrac{\textit{Depreciation of tangible fixed assets at the beginning of the year}}{\textit{Tangible fixed assets at the beginning of the year}}$$ b) depreciation ratio at the end of the year: $$\dfrac{\textit{Depreciation of tangible fixed assets at the end of the year}}{\textit{Tangible fixed assets at the end of the year}}$$	The change in depreciation level is determined by comparing the depreciation ratios at the beginning and at the end of the year. The changes in the value of the assets, increases in depreciation rates, low rate of assets renewal, etc. have an impact on whether this ratio at the end of year increases or not. It is important to make sure that land is not included in the fixed assets value because land is not a depreciable asset
5. Usefulness (suitability) ratio	$$1-\textit{Depreciation rate}$$ or $$\dfrac{\textit{Book value of the tangible fixed assets}}{\textit{Acquisition value of the tangible fixed assets}}$$	The ratio shows whether the tangible fixed assets are useful for further usage. The lower this ratio, the less useful the assets are for production or services provision. As the ratio approaches zero, it is necessary to start the assets renewal procedures.

In order to improve the technical condition of certain tangible fixed assets, enterprises often try not only to improve but also change the technical condition of such assets – the assets are repaired, reconstructed or otherwise reorganized. During the analysis it is important to determine whether the repair or reconstruction works on

tangible fixed assets have improved their useful characteristics and whether the useful life of the assets has changed.

Usage analysis. It is very important to use the tangible fixed assets effectively, i.e. all their elements have to contribute to the production, increase of provided services or achievement of other enterprise's goals to a certain extent. In order to estimate the effectiveness of the tangible fixed assets, it is suggested to estimate and evaluate various comparative ratios (see Table 5).

Table 5. Indicators describing the usage effectiveness of tangible fixed assets

Indicators	Formulae for their calculation	Description of the indicators
1. Tangible fixed assets productivity ratio	$$\frac{Production\ value}{Tangible\ fixed\ assets}$$	This indicator shows the value of cost of goods manufactured per one euro of tangible fixed assets. Changes in the active part of the assets have the biggest influence on this indicator. This indicator can be estimated by not only calculating the value of the cost of goods manufactured, but also the standard hours allowed to production or standard direct labour costs
2. Tangible fixed assets receptivity ratio	$$\frac{Tangible\ fixed\ assets}{Production\ value}$$	This indicator shows how many tangible fixed assets does an enterprise have, and whether it is enough for the planned production volumes
3. Tangible fixed assets turnover ratio	a) in times: $$\frac{Sales\ revenue}{Tangible\ fixed\ assets}$$ b) in days: $$\frac{Tangible\ fixed\ assets \times 365}{Sales\ revenue}$$ or $$\frac{365}{Tangible\ fixed\ assets\ turnover\ ratio\ in\ time}$$ or $$\frac{Tangible\ fixed\ assets}{Sales\ revenue\ per\ day}$$	This indicator shows how effectively does an enterprise use its assets to earn the sales revenue and what is the sales revenue per one euro of the assets ratio This indicator shows how many days does the tangible fixed assets circulation process take during the accounting period
4. Labour provision with tangible fixed assets	$$\frac{Tangible\ fixed\ assets}{The\ number\ of\ workers\ during\ the\ busiest\ shift}$$	This indicator shows the tangible fixed assets per employee
5. Technical labour provision with active tangible fixed assets	$$\frac{Active\ tangible\ fixed\ assets}{The\ number\ of\ workers\ during\ the\ busiest\ shift}$$	This indicator shows whether employees have enough machines, equipment, devices and other active assets required for certain production operations
6. Tangible fixed assets to long-term debt ratio	$$\frac{Tangible\ fixed\ assets}{Long-term\ liabilities}$$	This indicator shows how many times the tangible fixed assets can be used to settle the long-term liabilities

Table 5 shows that the usage of tangible fixed assets is assessed based on the production levels or sales revenue that result from this type of assets; also, whether there are enough assets to settle the long-term liabilities.

Profitability analysis. When analysing the tangible fixed assets profitability, not only the financial, but also productive, commercial and investment activities of an enterprise can be assessed. Thus not only managers are interested in profitability indicators but many external information users as well. Various indicators may be used to assess the tangible fixed assets profitability (see Table 6).

Table 6. The tangible fixed assets profitability indicators

Indicators	Formulae for their calculation	Description of the indicators
1. Gross profitability of tangible fixed assets	$$\frac{Gross\ profit}{Tangible\ fixed\ assets}$$	This indicator shows how much euros of gross profit go to one tangible fixed assets euro
2. Net profitability of tangible fixed assets	$$\frac{Net\ profit}{Tangible\ fixed\ assets}$$	This indicator shows how much euros of net profit go to one tangible fixed assets euro
Factors influencing a level of net profitability of tangible fixed assets	$$Net\ profitability\ of\ sales$$ $$\times Tangible\ fixed\ assets\ turnover$$ $$ratio\ (in\ times)$$ $$=$$ $$\frac{Net\ profit}{Sales\ revenue} \times \frac{Sales\ revenue}{Tangible\ fixed\ assets}$$	Identification of the factors creates a possibility to estimate the potential to increase the activity results. The main factors are the indicators of the changes in net profitability of sales and tangible fixed assets turnarounds. These indicators can be further divided into smaller indicators
3. Cash return on tangible fixed assets	$$\frac{Cash\ flows\ from\ operating\ activities}{Tangible\ fixed\ assets}$$	This indicator shows the role of the assets when generating cash from the main activity. It is a substitute for the assets profitability indicator

In practice, enterprises usually estimate the net profitability of the tangible fixed assets. Its level may be assessed by comparing the enterprise's profitability levels of several periods, by comparing it to the profitability levels of enterprises from the same industry or by comparing the profitability levels of different departments or responsibility centres of the enterprise.

However, it is not enough to conduct a comparative analysis of the tangible fixed assets profitability. It is important to examine the factors that had an influence on the profitability ratio. As the Table 6 shows, two factors have an influence on the tangible fixed assets profitability: net profitability of sales and tangible fixed assets turnover ratio. These factors can be further divided into the component elements by using the DuPont pyramid analysis method. Different authors provide different types of the DuPont assets profitability analysis. The prepared structure of the DuPont pyramid analysis does not matter, what matters is division of these indicators into elements as small as possible. Division of the aforementioned indicators into the sales revenue, net profit and tangible fixed assets has the largest practical significance. The influence of net profit and changes in assets for the tangible fixed assets profitability is of crucial significance. There is a direct relation between the tangible fixed assets profitability and net profit. As the amount of net profit increases or decreases, the net profitability of the assets increases or decreases accordingly. Whereas the relation between the profitability and tangible fixed assets value is inverse. As the value of the assets decreases, the net profitability of tangible fixed assets increases and vice-versa – as the assets value increases, the profitability decreases.

When conducting a more in-depth analysis of the factors influencing the tangible fixed assets profitability, is appropriate to divide the sales revenue, net profit and fixed assets indicators even further. For instance, the tangible fixed assets could be appropriately divided into active and passive assets; net profit can be divided into sales revenue, cost of goods sold, cost of services provided, selling expenses, general and administrative expenses; sales revenue into revenue from operating activities and revenue from untypical activities. Any of these elements can be divided further: active assets into machines, equipment, devices and other active assets required for certain production operations; cost of goods sold into raw materials cost, labour cost, overhead costs, etc.; revenue from operating activities into revenue of goods sold and revenue of services provided, etc. Such division helps to determine which component element of tangible fixed assets had the biggest or smallest influence for the tangible fixed assets profitability. It is important to analyse the factors determining the tangible fixed assets

profitability when predicting the enterprise's expansion possibilities. The analysis of the influence of these factors during several accounting periods can help to manage the tangible fixed assets profitability and for the managers to select the strategy – whether to increase the assets turnaround or sales profitability.

The complex tangible fixed assets analysis is completed by summarizing the results of all the mentioned stages. This part of the complex analysis is very important because the results underline the problems of the usage of tangible fixed assets, reveals the reservas as well as the unexploited possibilities to use all the elements of the assets. Suggestions on the composition, structure, dynamics, changes, technical condition, profitability and better usage of the tangible fixed assets have to be prepared as well.

Conclusions

Tangible fixed assets are very significant for the financial state of an enterprise and its activity results. They are used in production, provision of services, sale of goods, for administrative purposes; in other words, they provide specific economic benefits for the enterprise.

In 2017, the tangible fixed assets in Lithuanian business enterprises accounted for 29,033 million EUR and it increased by 2.53 compared to 2013. In 2017, they accounted for 37.0% of all assets and for 62.01% of fixed assets. The following categories accounted for the largest part: non-residential buildings (31.6%), construction (20.9%) and machinery and equipment (15.3%). Tangible fixed assets are used in enterprises from all types of economic activities. In 2017, the largest part of this type of assets was used in real estate activities (22.52%), transportation and storage (17.59%) and manufacturing (15.62%).

Not only managers, but also many external information users, such as investors, banks, insurance companies, tax authorities, economics experts, etc., are interested in the composition, structure, technical condition of the tangible fixed assets. With regards to the significance of this type assets, it is very important to carry out their complex analysis; no such analysis has been prepared so far. Recommended methodology for the tangible fixed assets complex analysis consists of the following stages: 1) compositional analysis; 2) structural and dynamic analysis; 3) change analysis; 4) technical condition analysis; 5) usage analysis; 6) profitability analysis. The results from specific stages of the analysis are used for the management decisions in order to use the assets more effectively, improve enterprise's activity results, its activity continuity and competitiveness in the market. This methodology of the analysis can be successfully applied in the enterprises of various sizes and economic activities.

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SUSTAINABLE DEVELOPMENT OF ORGANIZATIONS BASED ON THE COMBINATORIAL MODEL OF ARTIFICIAL INTELLIGENCE

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Abstract. The article specifies the organizational capabilities of application of artificial intelligence technologies in the model of sustainable development of the organization. Also, the article provided the theoretical and methodological background of the organizational changes and development, as well as determined the possibilities of application of artificial intelligence technologies in the functionality of the organization. It was proposed to use the methodological approach to application of neural networks in maintaining of the intelligent management of organizational development. There was developed the combinatorial model of artificial intelligence for decision making about the organizational development.

Keywords: artificial intelligence; sustainable development; organization; neural networks; fuzzy sets; real parameters; expert surveys

1. Introduction

The relevance of the study on organization development, the principles and methods of managing the process of changes in organizations is determined by their critical significance for achievement of the goals of social and economic development, ensuring the strategy of modernization of the economy, and increasing of the gross domestic product of the country. For several recent years, the practical aspects of economic management in the world faced the major changes, enterprises and organizations started

operating in new economic conditions, due to the increased competition rates, and the continually changing external environment. The global competition and the need for efficient use of such key success factors as innovativeness, expenses, product quality, require all organizations to increase the organizational flexibility and adaptive capacities (Repenning, 2002). The latter feature is mainly provided at the expense of the tools of artificial intelligence, organizational changes and development. At the same time, in many similar studies the methods of organizational changes based on artificial intelligence are considered without regard for their integrated impact and relationship with the organization's strategy.

The great variety of available approaches to the problem of formation and realization of the direction of stable development in general and organizational changes in particular, conditioned the need for conducting the study on examination and generalization of research and methodological tools for the usage of artificial intelligence, in order to receive the sustainable dynamics of the organization development.

2. Literature Survey

The research methodology of organizational development and changes, based on artificial intelligence technologies and the intelligent assistance systems, are presented in the following forms: intelligent expert systems; inductive systems; semantic networks, neural networks, genetic algorithms.

1) The intelligent expert systems contain the knowledge database and inference engine. Some researchers (Brynjolfsson, McAfee, 2012; Carley and Gasser, 2000; Sampson et. al. 2002) demonstrated that the user interface, which is required for the correct transmission of user responses to the knowledge base, is the important component of the expert system. Also, the other researchers (Fuchs et. al. 2016; Bilan, Y., Lyeonov, S., Luylyov, O., Pimonenko T., 2019) noted that the ability of the system to explain on demand the train of its thought, providing comments to various stages of its intelligent decisions, is the important characteristic of expert systems.

2) Inductive systems. The inductive systems in the development process of organizations allow passing many difficulties in acquiring of knowledges from the source data, as well as reduce the time and computing costs, due to the fact that the reporting systems are able to manipulate the crude model of the knowledge area (see Jarrahi, 2018; Lucas et. al. 1990; Schmidhuber, 2015; Tsang & Kwan, 1999). The expert has to provide the learning inductive system with the examples of observable signs and the corresponding diagnoses. The inductive systems use artificial intelligence predicates for testing the membership of some pattern to the certain category or class. The conceptual language includes the rules, predicate formulas, automata (accepting or rejecting the decisions).

3) The semantic networks are the system of knowledge, which have the certain sense in view of the holistic image of the network. In particular, the nodes of such system correspond to the concepts and objects, and arcs — object relationships. Usually, the semantic network interpretation is realized through the procedures using the method. There are several types of semantic network processing procedures; the most typical of them is matching of parts of the network architecture, depth and width search procedures, which interpret the semantic network as the weighted graph, as well as subnetworks

construction and matching them to the network database (Moody et. al. 2003; Nagar & Malone 2011; Wang, 2016; Vasylieva, T., Lyeonov, S., Lyulyov, O., & Kyrychenko, K., 2018).

4) Neural networks. The systems, which have the neural networks (neuronets) for solution of a problem(s), are called the neural network systems. The set of neurons connected by axons is called the neural network. The neuron shall be understood to mean rather conditional neuron model of the artificial intelligence model, which performs a number of transformations over the input signals (Ramchurn et. al. (2012). In the certain scientific works (Dirican, 2015; Gibson et. al. 2015; Lin, 2002), it is stressed that the independence of approximation accuracy from the dimensions of inputs serves as the significant advantage of neural network approximation in comparison with the traditional approximation methods. Therewith, the problem of the maximum acceptable dimension and the largest number of independent variables is completely compensated, which makes the traditional methods of approximation as unusable. The reporting factors make the neural network approach as universal and indispensable for representing the complicated Boolean and other functions from a large number of arguments. To date, there are actively developed new methods to estimate the approximation accuracy depending on the number of neurons, and neural networks construction with the specified approximation accuracy, in terms of the additional conditions and constraint on the learning rates of the neural network, the neural network layout and topology, the type of neuron activation function.

5) Genetic algorithms and evolutionary modeling. The evolutionary design of the artificial (technical) system shall be understood to mean the goal-directed development of its development processes, and changes, based on the analogies with models of natural evolution. The evolutionary design is located at the intersection of the theory and methodology of computer-aided designing, development of the theoretical foundations of information science and biological sciences on evolution (Etzioni & Etzioni 2017; Tkachenko, V., Kwilinski, A., Klymchuk, M., & Tkachenko, I., 2019). The evolutionary design is suggested to use the lines of computer evolution models (in particular, genetic and evolutionary algorithms) and building of hybrid evolutionary models (Gonzalez et. al. 2016; Grossmann, 2007), in terms of solution of the design problems and system optimization. Thus, we generate the concept that sustainable development of the organization can be represented in the complex of elements of the application methodologies of artificial intelligence, and the advantages of those ones, which form the organizational development based on the current economic situation.

3. Methods

Various concepts and models of organizational development are realized into practice through the methods of organizational changes. To date, there is no generally recognized definition of the organizational development methods. First of all, they have the practice-oriented focus, and the authors usually developed them, based on their ideas about realization of the effective changes. The system research considers the analysis of the system and environment interaction.

4. Results

4.1. Theoretical and methodological background of the organizational changes and development

Within frames of the study, the borderlines between the system and environment can significantly change. It appears that the organization (enterprise) is often considered as the system consisting of two main subsystems – the management and managed subsystems (Fig. 1).

External environment
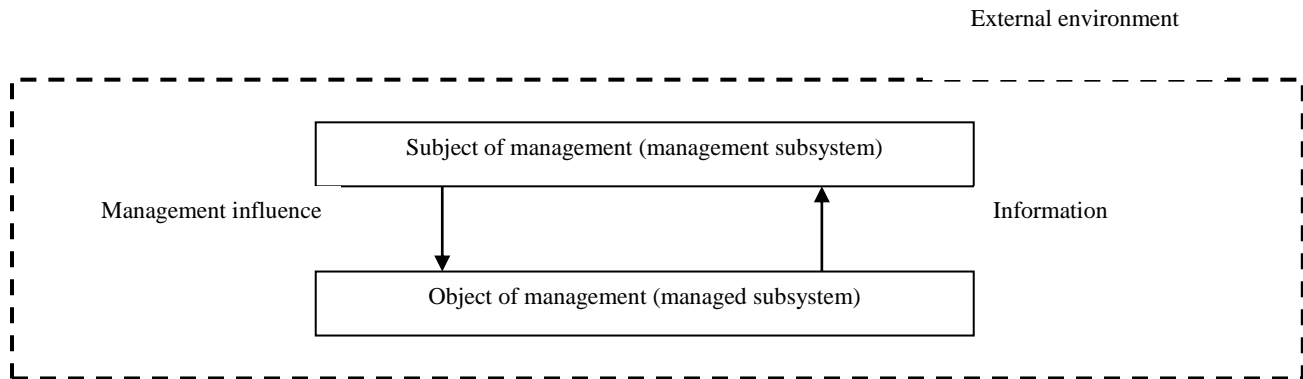
Figure 1. Cybernetic representation of the system within frames of organizational development (see Sastry, 1997)

The reporting classification allows diversifying the methods of organizational development, and provides guidance on the relationship between them. At the same time, it does not provide any answers on the issue of cause-and-effect communication between the methods. These aspects indicate the complexity of usage of the traditional technologies of economic development and econometric modeling, and put the issue of moving to the artificial intelligence technology in formation of the model of sustainable development of the organization. In the middle of modern thinking on the management of the organization development, there is the issue of adaptability and intellectualization to the constant changes of the external environment, which form the vector of sustainable development of the organization (Figure 2).
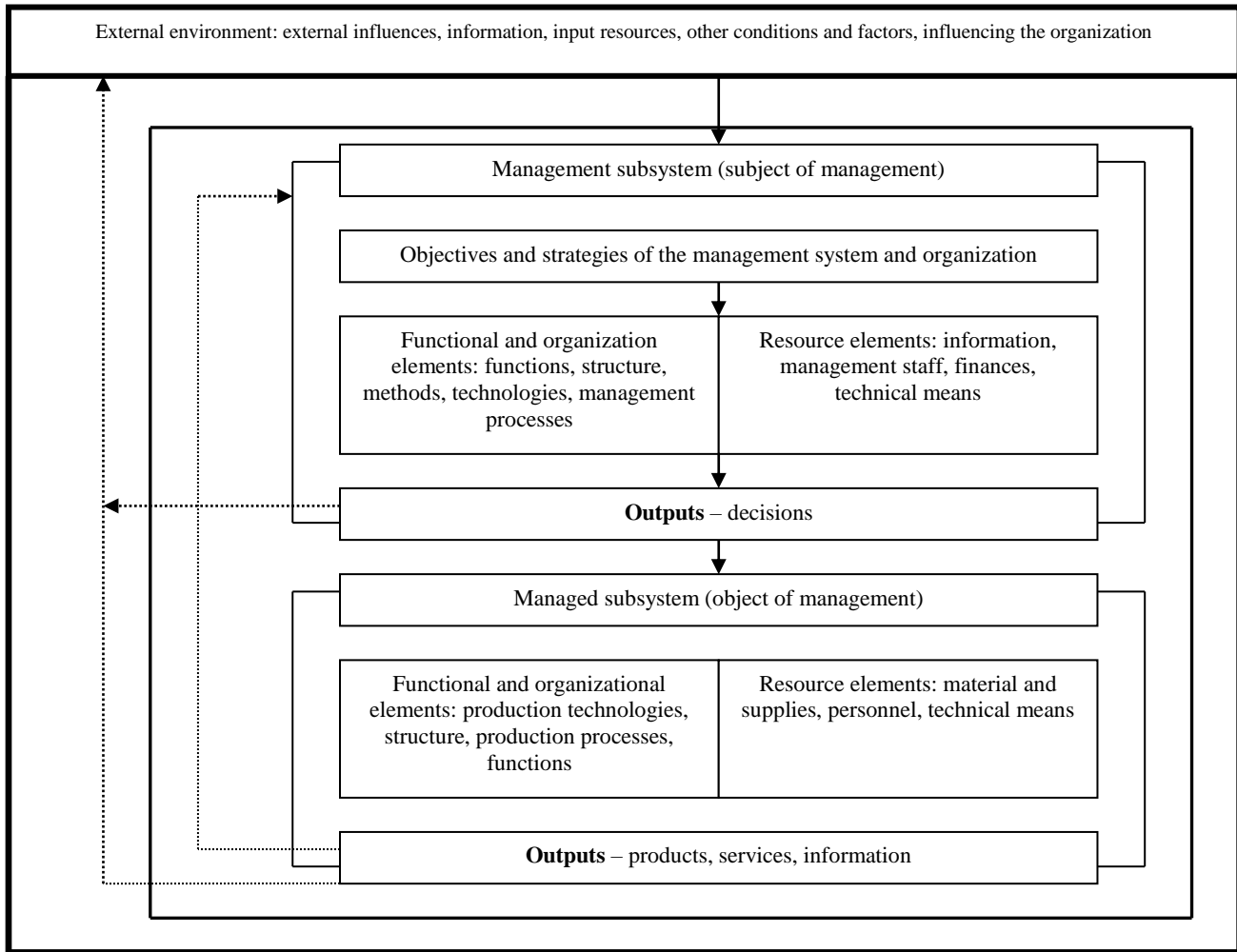
Figure 2. System view on the components of the organization development

Therefore, we shall define the method of organizational development as the set of different methodologies with the uniform nature, which application has impact on one or more subsystems of the organization, as well as changes its qualitative characteristics. All measures, taken to ensure the further achieving of the outlined objectives, are interrelated. Thus, in terms of making a decision to change the form of the organization existence, it always ultimately leads to changes in the management system - structure, processes, methods, etc. Technology variations certainly lead to formation of a new production and labour management, and contribute to provide the appropriate measures for the human resource management (Saunders et. al. 2006; Kwilinski, A. 2019).

We can maintain that application of the system approach in management issues facilitates the task of considering the organizations as open-ended systems in the unity of their components and inextricable connection with the outside world. The following definition accepted in Cybernetics serves as the generalization of ideas about management: the management shall be understood to mean the processes of information perception, processing, storage and transmission.

Thus, any organization, which plans to develop or survive in the dynamic environment, has to work in the process of persistent changes, because its capacities of continued functioning are endangered. In such cases, the current economic environment for most organizations has such format that introduction of changes turned from emergency situation into the usual systematic process. The enterprises are forced to become flexible, constantly respond to changes in the external environment, develop and realize various local and global projects of changes in their business activities, which should develop without loss of control.

4.2. Usage of artificial intelligence technologies in the functionality of the organization

For realization of the effective performance of support systems of sustainable development of the organizations, it makes sense to apply the systems with artificial intelligence elements. It will allow making decisions based on the work of artificial intelligence models, which describe the processes of functioning at the level of qualitative concepts in formal manner. Application of artificial intelligence does not mean refusal of the traditional recommendations, methods based on the probability-theoretic view of the managerial processes of economic activities of the certain organization. Artificial intelligence models complement the traditional approaches to modeling and allow the creating of hybrid intelligence models (Staub et. al. (2015). The reporting approach somewhat simplifies decision-making and simultaneously reduces the risks.

Application of the artificial intelligence models requires the corresponding collection and processing of expert information: definition of the linguistic variables, characterizing the parameters of the management system of economic activities; formalization of decision-making rules. Expert estimations allow combining the experience and knowledge of specialists with statistical estimations, therefore they give more realistic figures. Also, the benefit of the reporting approach to modeling is that it allows estimating those situations, which would not appear in the commercial activities of the organization yet, therefore they have not been formalized at all.

In the information systems based on expert knowledge, the rules (or heuristics), which are used to make decisions in the certain subject areas, are stored in the knowledge database. The artificial intelligence system receives the tasks in the form of a set of facts, covering the certain situation, and the system uses the facts and draws the reporting conclusion aided by the knowledge database (Wixom & Todd 2005). The general structure of the artificial intelligence system based on information management is presented in the Figure 3.
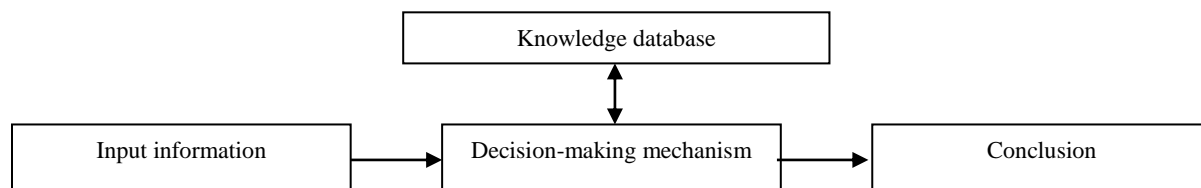
Figure 3. Model of knowledge representation, inference engine, and decision-making rules in the intelligent system

The provided model of knowledge representation, inference mechanism and decision-making rules defines the quality of expert estimations. The sizes and quality of the knowledge database (rules or heuristics) establish the following quality of expert estimations. The system operates in the following repetitive mode: selection (request) of data or research results, monitoring, interpretation of the results, uptake of new information, formation of temporal hypotheses by means of the rules, and then selection of the next amount of data or research results. The reporting process continues developing until coming of the information sufficient for providing the final conclusion on the vector of organizational development.

In the knowledge database of the intelligent system of information management, there are three types of knowledge:

1. structured knowledge – static knowledge about the subject area (once the knowledge is revealed, it does not change);
2. structured dynamic knowledge – changeable knowledge about the subject area (they start updating after new information becomes available);
3. working knowledge – knowledge applied for solution of the specific task or making consultations (Barro and Sala-i-Martin 2004).

Building of the knowledge database requires interviewing of specialists, who are the experts in sustainable development, and then systematizing, organizing, and providing of the knowledge with the specific pointers, in order to easily extract information from the knowledge database in the future.At user request, the decision-making systems should provide any advices in the situation, described by infinity of the input factors and parameters of the management system of economic activities *X1, X2 .... Xn*.

Any rule-based recommender system does not replace the person making the decisions, but only gives recommendations. The recommendations in form of the set of some decisions should most authentically correspond to the situation in the sustainable development system. Thus, the decision-making model for the management system of economic activity with fuzzy description of parameters is based on formalization of the subjective knowledge of specialists - experts.

Formation of the results of the models performance develops in the following manner (Epstein, 2015). In terms of the infinity of *X1, X2 ... Xn* for the elements *x1, x2 ... xn* which are the parts of the corresponding base sets $x_i \in = XI$, the experts specify the membership degree of the values of fuzzy variables to the base sets. The experts formulate the rules of decision making. Then, for the time moment of t_0 the experts form decision making as the parameters of the corresponding models, and the current coordinates values of the input factors total $(x_{1,}^0 x_{2,}^0 .... x_{m,}^0) \in X1, X2 .... Xn = X$. The model performance develops in accordance with the diagram from the Figure 4.

The decision-making model produces the decision y, and the user receives the output document with explanations about features of the made decision.

X1, X2 ..... Xn   *X1, X2 ..... Xm*
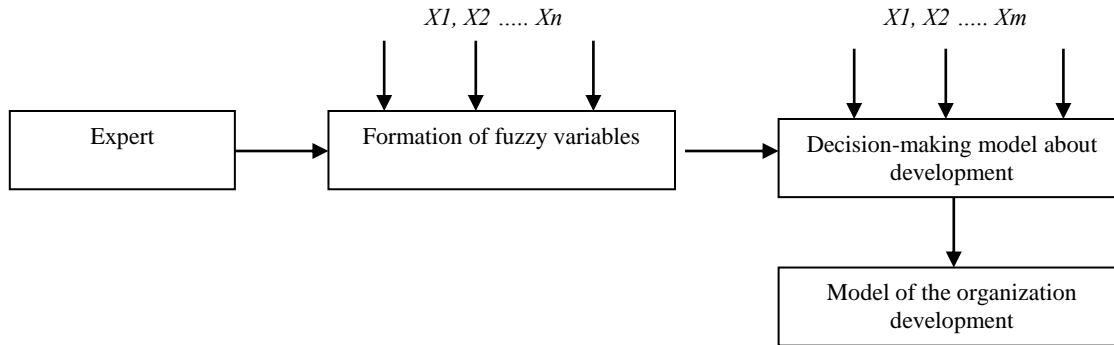
Figure 4. Decision-making model for the organizational development based on artificial intelligence technologies

In terms of making a decision, the decision maker should consider rather large number of factors, which are characterized as linguistic variables with the given term of sets (Smith, (2005). Therefore, the information management and recommendation system should consider all necessary factors as the input variables. In such case, there should be established the basic sets, syntactic and semantic rules for formation of the linguistic variable and its terms of application.

4.3. Application of neural networks in provision of the intelligent management of organizational development

Each artificial neuron forms its current state in the similar manner to the nerve cells of the brain, which can be either excited or inhibited. It has a group of synapses - unidirectional input connections, linked to the outputs of other neurons, and also has the axon - output connection of the reporting neuron, from which the signal (excitation or inhibition) enters the synapses of the following neurons. The general view of the artificial neuron is demonstrated in Figure 5.

At the first approximation, the artificial neuron simulates the features of biological neuron. Therefore, many input signals, specified as $x_{1,}^{0} x_{2,}^{0} .... x_{m,}^{0}$, come to the artificial neuron. The reporting input signals, which are collectively referred as the vector *X*, correspond to the signals coming to the synapses of the biological neuron. Every synapse is characterized with the value of synaptic connection or its weight W_j.

Each signal is multiplied by the corresponding weight *w1, w2 ... wn*, and enters the summation unit. Each weight corresponds to "the force" of one synaptic connection. (Infinity of weights is collectively referred as the vector *W*). The summation unit corresponds to the body of biological element, algebraically summarizes the weighted inputs, and forms the value *S*.
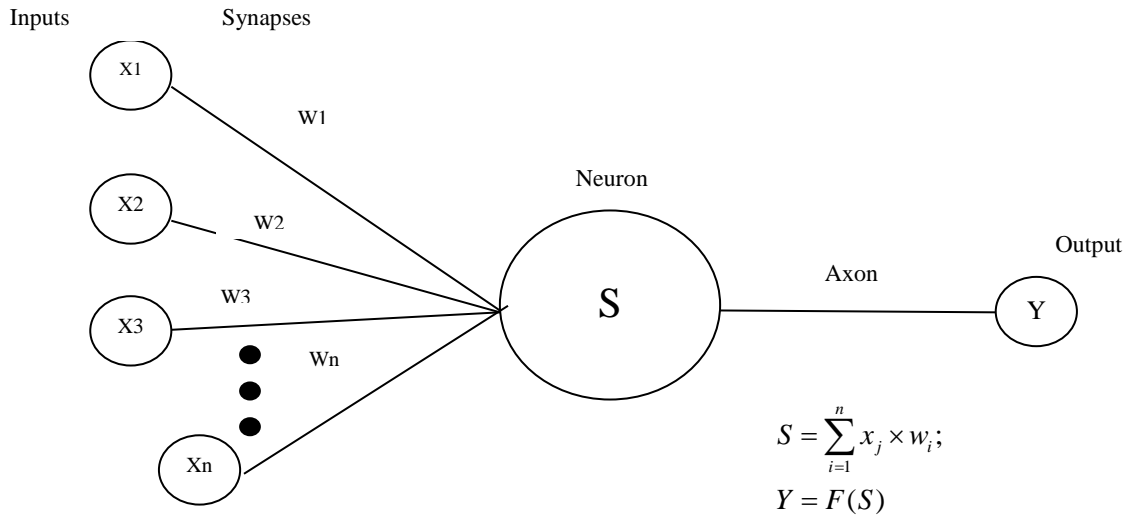
Figure 5. Model of the artificial neuron

Thus, the current state of neuron is defined as the weighted sum of its inputs:

$$S = \sum_{i=1}^{n} x_j \times w_i;$$

$$(1)$$

The output of neuron is the function of its state: *Y=F(S)*, where *F* is the activation function that provides more accurately simulation of the nonlinear transfer characteristic of the biological neuron, and provides great opportunities to the neural network. Although, one single neuron is able to realize the simple recognition procedures, the power of neural computations arises from the neuron connection in networks.

Large and more complex neural networks usually have the large-scale computational capabilities. Although, there were created the networks of every imaginable configuration, the layer-by-layer organization of neurons copies the layered structures of the certain parts of the brain. It turned out that such multilayer networks have more significant capabilities than single-layer networks, and for several recent years there were developed various algorithms to train them. Also, the multilayer networks can be formed in view of the cascades of layers. The output of one layer is the input for the following layer (Carley, 2003).

The neural network with backpropagation algorithm consists of several layers of neurons, moreover each neuron of the previous layer is connected to each neuron of the next layer. In most practical applications, it is sufficient to consider the two-layer neural network, which has the input (hidden) layer of neurons and the output layer (Figure 6).
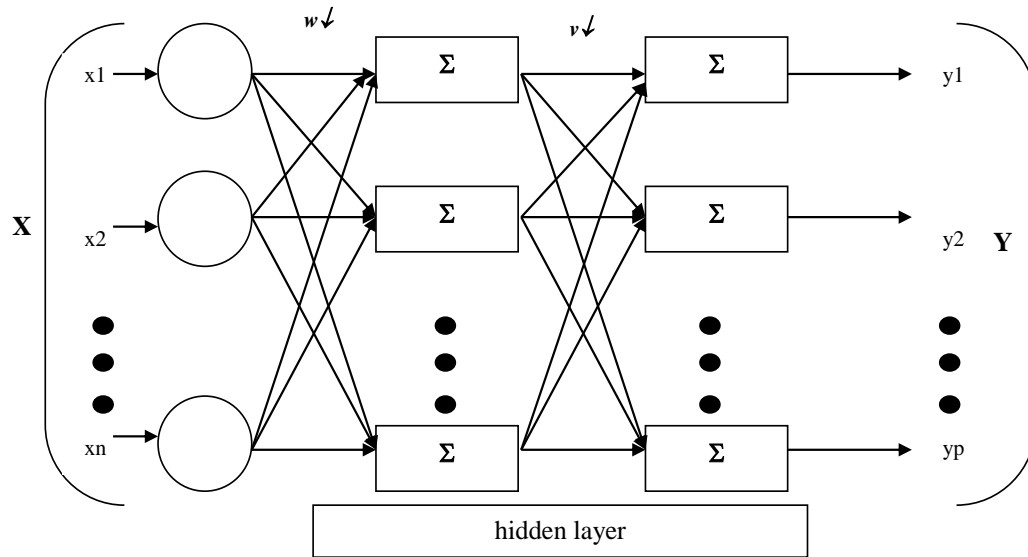
Figure 6. Neural network with backpropagation algorithm

The matrix of weight coefficients from the inputs to the hidden layer shall be denoted by *W*, and the matrix of weights connecting the hidden and the output layers – by *V*. As for indexes, we shall accept the following notations: the inputs are numbered by the index *i* only, the elements of the hidden layer – by the index *j*, and the outputs – by the index *k*. The number of network inputs is set to *n*, the number of neurons in the hidden layer – *m*, the number of neurons in the output layer – *p*. Let the network train towards the following sample $(X^t, D^t), t = \overline{1, T}$.

In terms of neural network learning, the objective is to minimize the target error function, which is located by the least square adjustment method (Chiang, (1992):

$$E(W,V) = \frac{1}{2} \sum_{k=1}^{p} (y_k - d_k)^2,$$

(2)

where y_k is set to the obtained real value of the *k* output of the neural network, when one of the input patterns of the sample is supplied to it;

d_k – the required (target) value of the *k* output for the reporting pattern.

The neural network learning process is done through the well-known optimization method of gradient descent, that means at each iteration step, the weight change is estimated according to the formula:

$$w_{i,j}^{N+1} = w_{i,j}^{N} - \alpha \frac{\partial E}{\partial w_{i,j}},$$

$$v_{i,k}^{N+1} = v_{i,k}^{N} - \alpha \frac{\partial E}{\partial v_{i,k}}.$$

(3)

where α is set to the parameter, determining the learning rate.

Since the systems of information support of decision-making processes usually function on the basis of the analysis of expert subjective knowledge, then the important task of selection of experts shall be resolved, as well as the equally important task of the procedure of acquiring and formalizing of their knowledge within frames of the organizational development concept.

In the system of information support of decision-making processes, there can be applied different models of fuzzy inference. Among the reporting models, we shall specify the following ones, which are the subjects for study. The fuzzy inference model can be constructed on the basis of matching in form of the accurate correspondence to sets of the fuzzy situations (described by tuples of fuzzy variables), as well as the made decisions. Also, the fuzzy inference model can be constructed as fuzzy relation on the direct product of the infinity of fuzzy inference rules and the fuzzy infinity of made decisions.

It is possible to determine the so-called fuzzy pattern situations by expertise, which will be corresponded to the certain decisions. The work of the fuzzy inference model consists in identifying of some real fuzzy situations (which appeared on the object under study) for the specific point in time, finding of the most "convenient" fuzzy pattern situation for the reporting real fuzzy situation, and then form the relevant decision.

4.4. Model of the combinatorial artificial intelligence

It is well-known the decision-making model on the basis of describing of the input variables as linguistic variables, and matching process between the sets of fuzzy variables (from the terms of linguistic variables) and elements of the infinity of decisions. The reporting model is called the combinatorial model, because it defines the classes of sets of fuzzy variables corresponding to the certain decisions. The current paragraph considers the main points of the model and its application features in tasks of the fuzzy choice in the management of economic activities, and determining the growth rates of the organization (Crouhy et. al. (2006).

The input variables (factors) that determine the primary data for decision-making processes, in ensuring sustainable development, are usually given in the form of linguistic variables. The model operates in accordance with the following rules. At first, they measure (determine) the physical component value of the point $(x_{1,}^{0} x_{2,}^{0} .... x_{n,}^{0}) \in X$, and then substitute these values in the membership function μ_{Li} of the pattern classes L_j. Then they calculate the values $\mu_{Li}(x_{1,}^{0} x_{2,}^{0} .... x_{n,}^{0}), j = 1, |H|$. Among all values of μ_{Li}, they

find the maximum value $\mu_{LS} = \max_j(x_1^0 x_2^0 .... x_{n,}^0)$, and make the decision h_s, with the membership degree of μ_{LS}.

The further consideration of all features of building the model of sustainable development based on the combinatorial model of artificial intelligence will be realized through the example.

Let the infinity of parameters of the directions of strategic development of the organization to be determined by three components only *x1, x2 and x3*, defined on the infinity of *XI, X2, and X3*, respectively. Also, we shall define the linguistic variables describing the state changes to the infinity of *XI, X2 and X3*, as α, β, γ, respectively (Hofacker and Vetschera, (2001). Let suppose the term sets of the reporting linguistic variables:

$$T(\alpha) = \left\{\alpha_1, \alpha_2 .... \alpha_r\right\}; T(\beta) = \left\{\beta_1, \beta_2 .... \beta_w\right\}; T(\gamma) = \left\{\gamma_1, \gamma_2 .... \gamma_d\right\}$$

(5)

On base of the infinity of decisions *X4*, which determines the monitored range of made decisions (for example, the sum of investment in the monetary terms), we shall define the linguistic variable δ, which term infinity has the following form:

$$T(\delta) = \left\{\delta_1, \delta_2 .... \delta_m\right\}$$

(6)

The experts usually specify the following fuzzy sets:

$$C(\alpha_i) = \left\{ \prec \mu_{c(\alpha i)} \times \frac{x_1}{x_1} \succ \right\}, x_1 \in X1, i = \overline{1, r};$$

$$C(\beta_i) = \left\{ \prec \mu_{c(\beta i)} \times \frac{x_2}{x_2} \succ \right\}, x_2 \in X2, i = \overline{1, w};$$

$$C(\gamma_i) = \left\{ \prec \mu_{c(\gamma i)} \times \frac{x_3}{x_3} \succ \right\}, x_3 \in X4, i = \overline{1, d};$$

$$C(\delta_i) = \left\{ \prec \mu_{c(\delta i)} \times \frac{x_4}{x_4} \succ \right\}, x_4 \in X4, i = \overline{1, m}.$$

(7)

where:

$\mu_{c(\alpha i)}, \mu_{c(\beta i)}, \mu_{c(\gamma i)}, \mu_{c(\delta i)}$ are membership functions, which are formed by the expert survey method. For the classification model, the space of parameters for ensuring the organizational development is considered as three-dimensional space, which specifies the states in form of the situations defined by the sets of elements of the linguistic variables term sets α, β, γ (Wauters, Vanhoucke, (2015). The made decisions on the direction of development of the organization from the term set $T(\delta) = \left\{\delta_1, \delta_2 .... \delta_m\right\}$ of

the linguistic variable δ, are corresponded to the required situations. As a result, the model will be presented in form of the situation-decision table, which general view is presented in the Table 1.

Table 1. Table of compliance "situation - decision"

α	β	γ	δ
$\alpha 1$	$\beta 1$	$\gamma 1$	$\delta 1$
$\alpha 1$	$\beta 1$	$\gamma 1$	$\delta 1$
$\alpha 1$	$\beta 1$	$\gamma 1$	δk
$\alpha 1$	$\beta 1$	$\gamma 2$	$\delta 1$
$\alpha 1$	$\beta 1$	$\gamma 2$	$\delta 3$
$\alpha 1$	$\beta 1$	$\gamma 2$	δp
αr	βw	$\gamma d - 1$	$\delta 3$
αr	βw	$\gamma d - 1$	$\delta 4$
αr	βw	$\gamma d - 1$	δm
αr	βw	γd	δk
αr	βw	γd	δn
αr	βw	γd	δm

Thus, after determining parameters of the vector of organizational development and presenting these parameters in view of the point $(x_1^0, x_2^0, ... x_n^0) \in X$, then we obtain the numeric values of the membership degrees $\mu_{c(\alpha i)}, \mu_{c(\beta i)}, \mu_{c(\gamma i)}, \mu_{c(\delta i)}$.

The reporting values of the membership degrees $\mu_{c(\alpha i)}, \mu_{c(\beta i)}, \mu_{c(\gamma i)}, \mu_{c(\delta i)}$ are substituted into the following formula:

$$\mu_{Lj}(\Psi) = \underset{i=1,ni}{V} \mu_{\alpha 1}(x_1) \& \mu_{\alpha 2}(x_2) \& ... \mu_{\alpha n}(x_n),$$

$$x_i \in = XI, = i = \overline{1, nm} j = \overline{1, |H|}$$

(8)

where:

n_i is set to the number of sets $\alpha_i^1......\alpha_n^1$, belonging to the *j-y* splitting class.

Then there should be determined the splitting class *Ls*, which has the highest value of the function μ_{LS}. After that, there is formed the recommendation on decision making h_s about beginning of development of the organization (Jin & Levitt, (1996). Also, the classification model can be realized taking into account the measures of preferential choice of the development decision.

In terms of the reporting approach, each of the possible variants S_j of combining of the organizational development parameters and possible development decisions, is matched with the advantage degree p_j, specified by the experts.

Then the table of compliance "situation - action" will take the view of the Table 2.

Table 2. Table of compliance "situation - action"

S	α	β	γ	δ	P
S1	α_1	β_1	γ_1	δ_1	P1
S2	α_1	β_1	γ_1	δ_1	P2
Sk	α_1	β_1	γ_1	δ_k	Pk
Sk+1	α_1	β_1	γ_2	δ_1	Pk+1
Sk+2	α_1	β_1	γ_2	δ_3	Pk+2
St	α_1	β_1	γ_2	δ_p	Pt
Sp	α_r	β_w	$\gamma_d - 1$	δ_3	Pp
Sp+1	α_r	β_w	$\gamma_d - 1$	δ_4	Pp+1
Sn	α_r	β_w	$\gamma_d - 1$	δ_m	Pn
Sg	α_r	β_w	γ_d	δ_k	Pg
Sg+1	α_r	β_w	γ_d	δ_n	Pg+1
Sm	α_r	β_w	γ_d	δ_m	Pm

Decision making on the direction of organizational development is realized as follows. For the takt time t_0, there are specified the parameters of the organizational development vector in form of the point $(x_{1,}^0 x_{2,}^0....x_{n,}^0) \in X$, and determined the numeric values of the membership degrees $\mu_{c(\alpha i)}, \mu_{c(\beta i)}, \mu_{c(\gamma i)}, \mu_{c(\delta i)}$. The values of the membership degrees are substituted into the formula (8), and then the splitting class *Ls* is determined, which has the highest value of the function μ_{LS}. The decisions and advantage degrees are matched to the received splitting class *Ls*. Then, there are determined the certain decision in accordance with the adopted rules. The rules can develop as follows:
1. the decision is made, based on the highest value of the degree of preferential choice:

$$\delta_j : j = \max_l \_ p_l^i \qquad (9)$$

2. the decision is chosen in a random manner from the subset of decisions, formed by the splitting class *Ls*. The subset is determined by the task of the acceptable level of values of the degrees of preferential choice, so the fixed pl^i_{dop} is specified by the subset P_i^*, according to the conditions:

$$p_l^i \in P_i^*, \_ if \_ p_l^i \geq P_{l\_dop}^i \qquad (10)$$

then the uniformly distributed number is generated within the range [0,1], and according to the scheme of random events there is chosen the single one from the infinity of decisions, which has the degree of preferential choice belonging to the subset P_i^*.

In terms of building of the decision-making systems for the management of economic activities, the advantage of the classification model consists in the ability to establish rather full compliance between the sets of fuzzy variables, characterizing the system state (the organization itself), and elements of the infinity *H* of decision making about the development parameters.

4.5. Combinatorial model of artificial intelligence for decision making about the organizational development

It is well-known the method of building of the decision-making models based on choice of decisions, taking into account the real fuzzy situations which developed on the studied object, as well as their matching with the fuzzy pattern situations. The experts specify the list of fuzzy pattern situations. Also, the experts match the combinatorial decision for each fuzzy pattern situation. The task of making a decision on development comes down to matching of the real state of the organization with the pattern states. It is necessary to specify the most convenient pattern situation of the real situation, and then in accordance with the reporting fuzzy pattern situation, there is made the combinatorial decision on the development parameters (Muggleton, (2014). The Figure 7 demonstrates the main point in work of the combinatorial model of artificial intelligence decision-making on development of the organization.

Real development parameters
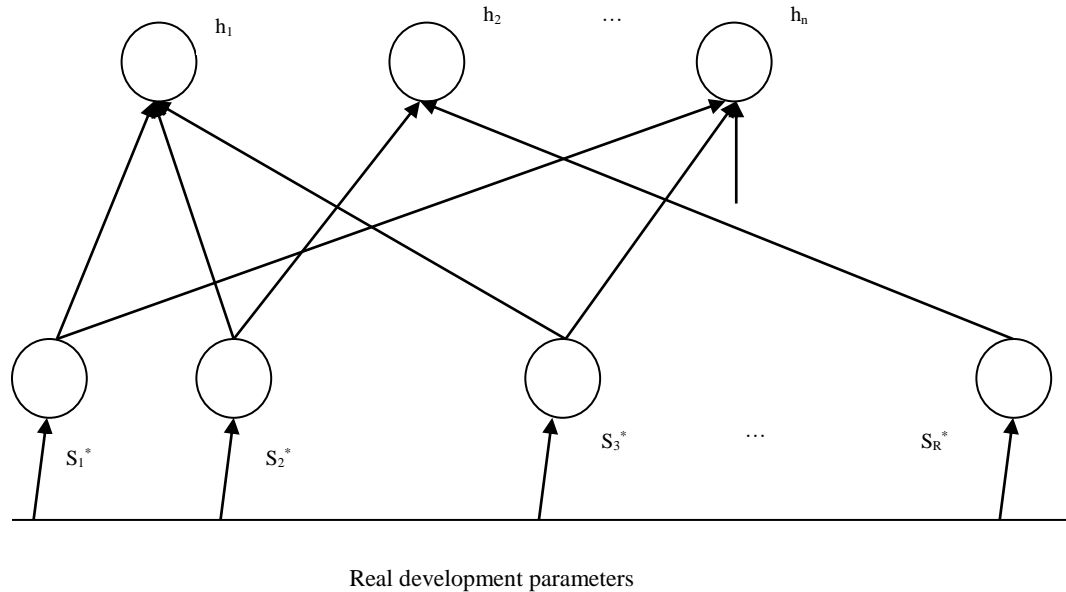
Figure 7. Real development parameters in the model of decision making artificial intelligence ((Muggleton, (2014)

The pattern situations about possible states of the organizational development are specified in form of elements of the large set $S^* = \left\{ S_1^*, S_1^* ... S_R^* \right\}$, the infinity of decisions and parameters of the organizational development consists of elements $h1, h2, .., h_m$.

Let consider the basic foundations of fuzzy logics, which are applied to build the combinatorial model of variations of the organization development. The fuzzy situation S is called as the second level fuzzy set:

$$S = \left\{ \prec \mu_s \frac{\alpha_i}{\alpha_i} \succ \right\}, \alpha_i \in A$$

(11)

where $\left\{ \alpha_1, \alpha_2 .... \alpha_r \right\}$ is set to be the i linguistic variable, characterizing the i component of the fuzzy state S. The set A has the following form:

$$A = \left\{ \alpha_1, \alpha_2 .... \alpha_n \right\}$$

(12)

We can use the following fuzzy situation as the example, which determines the development prospects for organization: {"0.1/"large">, <0.8/"medium">, <0.4/"small"> /"guarantee of sustainable development">, "0.2/"large">, <0.6/"small">, <1.0/"medium">, <0.6/"small"> /"annual income level">, "0.3/"large">, <0.6/"medium">, <0.1/"small"> /"money saving ">}.

The state of development prospects for the organization is characterized with some real fuzzy situation S_i. The experts specify the fuzzy pattern situations S_j for the further decision making. In order to determine the proximity degree of real and fuzzy pattern situations, we apply such operations of the fuzzy logics as specifying the degree of inclusion, determining the degree of fuzzy alignment, determining the degree of fuzzy equivalence. The degree of inclusion $S_i \rightarrow S_j$, $S_i \subset S_i^*$ is determined according to the formula:

$$v(S_i, \ S_i^*) = \underset{y \in Y}{\&} \, v(\mu_{Si}(y), \mu_{Sj}(y)),$$
$$v(A, B) = \underset{x \in X}{\&} \, (\mu_A(x) \rightarrow (\mu_B(x)), A \rightarrow B = max(1-A, B).$$

(13)

The degree of fuzzy alignment of two fuzzy infinities S_i. and S_j^* is determined according to the formula:

$$\mu(S_i, \ S_j^*) = \underset{y \in Y}{\&} \, v(\mu_{Si}(y), \mu_{S*i}(y)), \mu(S_i, \ S^*_j) = v(S_i, \ S_j^*) \, \& \, v(S_i, \ S_j^*)$$

(14)

The degree of fuzzy alignment $\mu(S_i, \ S_j^*)$ is determined by:

$$\mu(S_i, \ S_j^*) = \underset{y \in Y}{\&} \, v(\mu_{Si}(y), \mu_{S*i}(y)), \mu(S_i, \ S^*_j) = v(S_i, \ S_j^*) \, \& \, v(S_i, \ S_j^*)$$
$$\mu(S_i, \ S_j^*) = \underset{y \in Y}{\&} \, \mu(\mu_{Si}(y_i), \mu_{S_i^*}(y_i^*)),$$
$$C(\mu_{\mu_{Si}(y_i)}(T_k^i), (\mu_{\mu_{S*i}(y_i)}(T_k^i) = (\mu_{\mu_{Si}(y_i)}(T_k^i) \longleftrightarrow (\mu_{\mu_{S*i}(y_i)}(T_k^i),$$
$$C(\mu_{\mu_{S1}(y_1)}(T_k^i), (\mu_{\mu_{S*1}(y_1)}(T_k^i) = (\mu_{\mu_{S1}(y_1)}(T_k^i) \longleftrightarrow (\mu_{\mu_{S*1}(y_1)}(T_k^i),$$
$$then \_ \mu_{\mu_{Si}(y_i)}(T_k^i) \, \bigcup (1-t, t) \_ \, and \_ \mu_{\mu_{S*1}(y_1)}(T_k^i) \, \bigcup (1-t, t),$$
$$C(\mu_{\mu_{Si}(y_i)}(T_k^i), (\mu_{\mu_{S*i}(y_i)}(T_k^i) = 1, \_ then \_ \mu_{\mu_{Si}(y_i)}(T_k^i) \in (1-t, t),$$
$$or \_ (\mu_{\mu_{S*i}(y_i)}(T_k^i) \in (1-t, t).$$

(15)

The fuzzy equivalence operations are determined according to the formula:

$$A \rightarrow B = \min \{[\max(1-A, B)], [\max(1-B, A)]\}.$$

(16)

Let consider the description of various fuzzy situations. In such case, the real parameters of the object shall be given as the set $X = [X1, X2...Xn]$.

For each parameter X_i, there is the given definition area $X(I) = [di_{min}, di_{max}]$, where di_{min} is set to be the minimum limit of the definition area, and di_{max} – the maximum limit of the definition area of the fuzzy variables from the term set of the linguistic variable, specified on the base infinity X_i.

According to the definition (11), the fuzzy pattern situations S_j are specified as follows. The fuzzy pattern situations have the symbol "*" located at the top right, and the symbol is not used to indicate the real fuzzy situations. The experts specify the number of fuzzy pattern situations for development of the organization $R = |S^*|$, where $S^* = \{S_1^*, S_1^* ... S_R^*\}$ is the infinity of fuzzy pattern situations, and for every fuzzy situation S_k the experts formed the values of the membership degrees of fuzzy large quantities

$\mu_{Sk(\alpha i)}$, defined for the corresponding linguistic variables (Ran Gilad-Bachrach et. al. 2016).
Following the provided expert surveys, we shall receive:

a) n is set to be the number of linguistic variables, characterizing the direction of organizational development;

b)   infinity of the linguistic variables:

$$\{\prec \alpha_i, T(\alpha_i), XI, G_i, M_i \succ\}, i = \overline{1, n} \tag{17}$$

c)   given fuzzy sets:

$$\overset{\square}{C}(\alpha_j^i) = \left[\prec \mu_{\alpha_j^i} \times \frac{x_1}{x_1} \succ\right], x_i \in = XI \tag{18}$$

d)   given fuzzy sets of the second level:

$$S^* = \left\{\overset{\square}{S}_{k=}^* \left\{\prec \mu_{Sk^*} \frac{\alpha_i}{\alpha_i} \succ\right\}\right\}, i = \overline{1, n}, k = \overline{1, R} \tag{19}$$

Let consider the example of the task of the infinity S^* of the fuzzy pattern situations.   In such case, the experts determined that the number $R=3$, in other words $S^* = \{S_1^*, S_1^* ... S_R^*\}$, and the number of linguistic variables $N=5$. The experts determine the values of the membership degrees:

$$\mu_{Sk^*}(\alpha_i), k = \overline{1, 5}; i = \overline{1, 3} \tag{20}$$

For example, let consider that the infinity of the fuzzy pattern situations of the organization development has the form as follows: S*{{"0.9/ "unsatisfactory">, <0.5/ "satisfactory">, <0.1/ "good" >/ "first parameter of the state">,
"0.7 / "unsatisfactory">, <0.6/"satisfactory">, <0.15 / "good" > / "second parameter of the state">, "0.6 /"unsatisfactory">, <0.7/"satisfactory">, <0.3/"good"> / "third parameter of the state"> ,
"0.4/ "unsatisfactory">, <0.8/ "satisfactory">, <0.5/"good">/"fourth parameter of the state">, "0.2/"unsatisfactory> <0.9/ "satisfactory">, <0.6 / "good"> / "fifth parameter of the state">}, {"0.5/"unsatisfactory">, <0.5/ "satisfactory">, <0.5/"good">/"first parameter of the state">, "0.4/"unsatisfactory">, <0.55/"satisfactory> <0.6/"good">/"second parameter of the state">, "0.7/"unsatisfactory">, <0.6/"satisfactory">, <0.05/"good">/"third parameter of the state">, "0.2/"unsatisfactory">, <0.75/ "satisfactory">, <0.3/"good">/"fourth parameter the state">, <<0.1

/"unsatisfactory) ", <0.9/ "satisfactory">, <0.25/"good>/"fifth parameter of the state">},
{"0.1/"unsatisfactory">, <0.9/ "satisfactory">, <0.5/"good">/"first parameter of the state">,
"0.2/"unsatisfactory">, <0.85/ "satisfactory">, <0.45/"good">/"second parameter of the state) ",
"0.3/"unsatisfactory">, <0.8/ "satisfactory">, <0.4/"good">/"third parameter of the state">,
"0.4/"unsatisfactory">, <0.7/ "satisfactory">, <0.35/"good">/"fourth parameter of the state">,
"0.5/"unsatisfactory">, <0.6/"satisfactory">, <0.5/"good">/"fifth parameter of the state">}}.

The Figure 8 demonstrates the variant of the task of some hypothetical membership functions within frames of determining the parameters of the organization development.
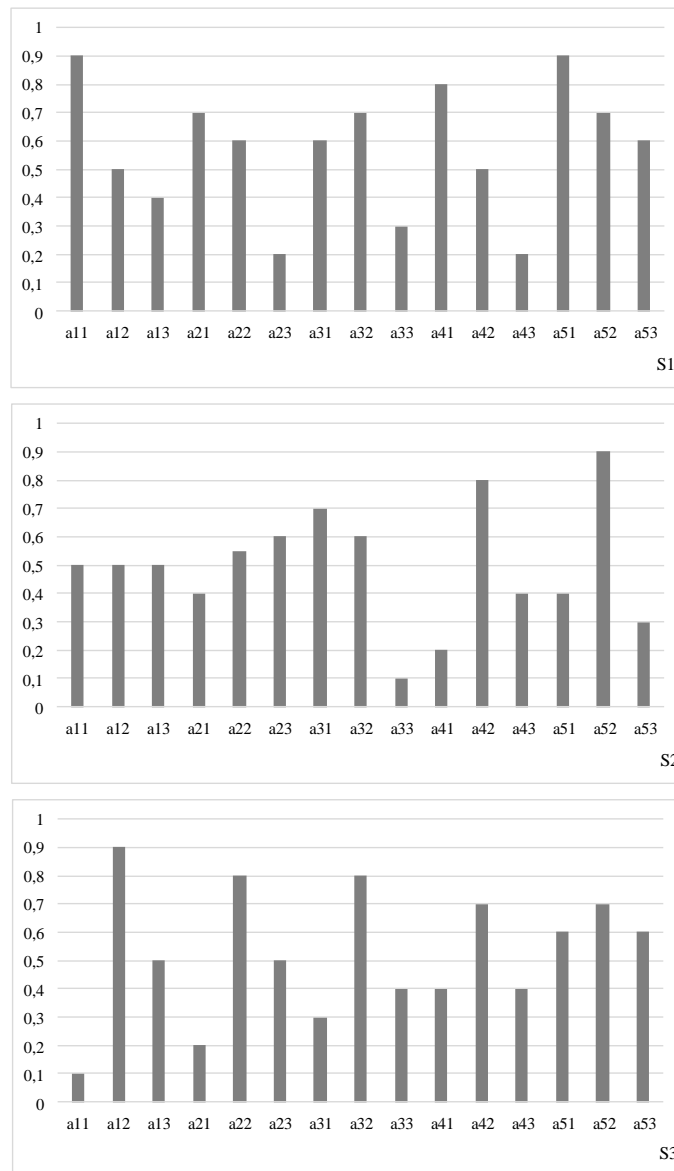
Figure 8. Variants of hypothetical membership functions within frames of determining the parameters of the organization development

It should be noted that in the general case, the membership functions have the continuous appearance. In the Figure 8 the functions have the discrete splitting, due to the fact that within frames of development

of the program of the decision making system, the information-managing membership functions can not be applied in the analog form (Siau and Wang, (2018).

There can be such event, which has the given real fuzzy situation $\overset{\square}{S}$ is not fuzzy equal to any of the fuzzy pattern situations $\overset{\square}{S_i}{}^{*}$. In such case, the proximity of the real and fuzzy situations is determined using the concept of fuzzy entirety of the situation.

The fuzzy (p - q) entirety of the situation is set to be such similarity of situations, when the fuzzy values of all features in the situations are fuzzy equal, except for the fuzzy values of no more than q features (p – the number of linguistic variables).

The degree (p-q) – entireties $\chi_{p-q} = (\overset{\square}{S}_i, \overset{\square}{S}_j{}^{*})$ of the situations $\overset{\square}{S}_{i,}$ and $\overset{\square}{S}_j{}^{*}$, which are determined as follows:

$$\chi_{p-q} = (\overset{\square}{S}_{i,} \overset{\square}{S}_j{}^{*}) = \underset{y \in Y/Yd}{\&}\ \mu(\mu_{si}(x), \mu_{si^*}(x)), \left|X_q\right| \prec q, \tag{21}$$

the feature x_k belongs to $Xq,$ if $\mu(\mu_{si}(x), \mu_{si^*}(x)) \prec t$.

The fuzzy matching on elements of the infinity S^* of the fuzzy pattern situations and elements of the set H of decision making is given as the threesome of large quantities, including F as the fuzzy set in $S^* x H$.

We believe that allocation of the pattern situations in the system ensures the further sustainable development of the organization, because they are used for matching in form of the fuzzy compliance of the made decisions. It is the major advantage of the model, because in such case there is no need to specify the rules of decision making, which simplifies the adjusting procedure of the information-managing and decision making system, built with application of the model. There are possible to apply some variants of simplification of the model, which are connected, for example, with the task of the accurate correspondence between elements of the infinity of pattern situations and elements of the infinity of the made decisions on the development parameters.

5. Discussion

The recommendations of such studies can be formed in direction of the formal definition of the fuzzy selection methods in the modified selection based on the Pareto criterion, the fuzzy lexicographic selection method, the fuzzy selection by weighted criterion, the fuzzy majority selection method. New models of artificial intelligence of fuzzy cumulative-extreme selection can be built in direction of the formal definition of the fuzzy choice rules in terms of fuzzy formulation of the selection criteria for the methods of sustainable development of the organizations.

The new models of fuzzy selection allow considering the results of fuzzy selection as enclosure of fuzzy relation in the criteria space – the set of fuzzy univariate criteria that will characterize the state of the

system of sustainable development. There can be formed new mechanisms of fuzzy selection, which selection function is formed from the selection functions by individual fuzzy relationships, and the selection process can take several stages. There was formally defined the mechanism of sequence fuzzy selection, and the mechanism of parallel fuzzy selection.

Conclusions

The article covered the conditions of application of the artificial intelligence technologies to build the decision making models on the directions and benchmark parameters of the organization development. It was stated that the fuzzy selection is determined by the fuzzy selection rules, which structure includes the fuzzy relations, involved in the selection process and subject to processing by the artificial intelligence model.

There were determined the variants of fuzzy inference models that can be applied in the management information system to ensure the organization development. There was developed the methodological approach for subjective decision making in form of the multidimensional model based on the combinatorial model of artificial intelligence for decision making on the organizational development. There were developed the classification model, the calculation model of the truth degree of fuzzy inference rules, the situational model of decision making, the model of fuzzy selection of decision making variants. Also, the article compared the models and described the methods of formalization of parameters in management of the organizational development.

The article developed the general requirements to simulation methods and the structure of decision making system for the systems of development management. Thus, the decision-making model for the management system of economic activity with fuzzy description of parameters is based on formalization of the subjective knowledge of specialists - experts (heads of the organization).

There was formally defined the fuzzy selection method based on the set-theoretic approach, with usage of capacities of the analysis of the fuzzy initial parameters and the fuzzy assignment of decision-making rules. The fuzzy selection method is mainly determined by the fuzzy selection rules, which logic meaning, qualitative and quantitative characteristics (components) are determined by experts.

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MECHANISM TO ENSURE SUSTAINABLE DEVELOPMENT OF ENTERPRISES IN THE INFORMATION SPACE[*]

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Abstract. There was developed the conceptual framework of information support of the management mechanism of sustainable development of enterprises, in order realize the continuous exchange of information between the controlling and controlled systems of the mechanism, provide the comparative analysis of variants of its improvement, as well as support the selection of effective management decision-making. The solution of the burning problem of ensuring sustainable development of enterprises, the scientific-theoretical justification and practical approaches to formation of the management mechanism of sustainable development, create the significant basis for keeping and expansion of the business activities of enterprises in terms of their transformational changes. Management of the sustainable development is reasonable to realize by the use of the appropriate mechanism as the bunch of successive and coordinated management methods and tools, applied by the management entities for the targeted development of enterprises. In accordance with the consistent characteristics of the object, criteria, principles in the work, the study estimated formation of the management mechanism of sustainable development of the enterprise. In contrast with the current mechanisms, the reporting one gives the enterprise the possibility of more content-related definition and justification of the directions of development; provides the high efficiency, flexibility and adaptability of the management system of the enterprise; guarantees the timeliness of identification of significant changes and development of the corresponding procedures; contributes to the continual improvement of the management processes of sustainable development of the enterprise, taking into account the variability of the market environment.

Key words: sustainable development; management mechanism; enterprise information system; information flows; information support

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1. Introduction

The traditional methods of enterprise management are not effective enough in terms of the fast-paced competitive business environment. Sustainable development is one of the key factors ensuring the competitive ability for the enterprise, which operates in terms of the increasing uncertainty and dynamic-response of the environment. Therewith, management of sustainable development is the basic requirement for the efficiency of enterprises progress. Therefore, looking for ways to ensure the management process of sustainable development of enterprises, which should be adequate to the new economic conditions, is one of the burning issues of economic research.

It is the mechanism of management that is designed to influence the factors, which condition specify the performance results of the enterprise. Establishment of the perfect economic mechanism of regulation of business development of the enterprise is the objective condition for ensuring its effective functioning in terms of the contemporary transformations.

Functioning of the management mechanism of sustainable development of enterprises is contingent upon the appropriate information support, which, in our opinion, is a functional complex, covering the process of the continuous targeted selection of the corresponding information indicators, required for the analysis and preparation of the operating management decisions on all components of the enterprise management process. Therefore, the management of sustainable development of the enterprise comes down to the continuous process of information treatment, its analysis for the further development and managerial decision-making. As a result, on the one hand, information is the basis of sustainable development management, and on the other hand, it is the uncertainty factor.

In such case, solution of the issues of ensuring sustainable development of enterprises requires the periodic adjustment of the management methods as way to improve the management mechanism of sustainable development of the enterprise.

The purpose of the article is formation of the theoretical and application-oriented foundations of the management mechanism of sustainable development of enterprises to improve their performance efficiency.

2. Literature Survey

In present-day conditions, development of the economic entity is usually connected with the level of globalization and internationalization of the economic relations, intensification of the competitive activity both at the international and national levels, risks of the macroeconomic stability of the country, dynamics of parameters of the business environment, regional and industry characteristics of the economic functioning mechanism of enterprises.

The analysis of the listed versions of development allowed specifying the common features concerning the points of view on identification of the studied item, and uniting them into groups.

The first group of scientists related such development with the progress of the system and changes of the constructive character (Álvarez Jaramillo, J., Zartha Sossa, J. W., & Orozco Mendoza, G. L. (2019), Liu, Z., Adams, M., Cote, R. P., Geng, Y., & Li, Y. (2018)). It should be noted that development does not always contribute to the progress and structural changes (Voegtlin, C., & Scherer, A. G. (2017)). Also, the reverse

processes can become the results of development — regression, in other words such development that has destructive nature (Drobyazko, S., et al. (2019)).

At the same time, in our opinion, highlighting of the neutral course of development comes in conflict with definition of the development process. Movement is the integral part of development, which means the constant change of the status, and the concept of "development" is considered as the result of a range of transformations, which recently happened (Bombiak, E., & Marciniuk-Kluska, A. (2018)). Therefore, the selection of the neutral course of development is possible in theory only (Kolk, A., Kourula, A., & Pisani, N. (2017), Baltgailis, J. (2019)).

The second group of scientists characterized the development process as quantitative and qualitative character changes in the system structure (Garbowski, M., et al. (2019), Liao, S. H., et al. (2017)). However, in addition to changes, there is the concept of the system performance (Van Zanten, J. A., & Van Tulder, R. (2018)).

On the one hand, functioning is driven by the support of the common vital functions (Jansson, J., Nilsson, J., Modig, F., & Hed Vall, G. (2017)), and on the other hand, it is the basis for new transformations, which will definitely determine the nature and direction of development (Johnson, M. P. (2017), Wu, G. C. (2017)).

The third group of researchers believed that development is the process of adaptation to changes of the external environment Vázquez Maguirre, M., Portales, L., & Velásquez Bellido, I. (2018)). Such adaptability of the system is required for its functioning and development, but it is not good enough (Hilorme, T., et al. (2019a), Hilorme, T., et al. (2019b)).
In order to ensure sustainable development, the enterprises need to form the more improved management system, which would better register the uncertainty of the external environment (Zhang, Y., et al. (2017)).

The issues related to formation of the management mechanism of sustainable development of enterprises still remained unattended by scientists. At the same time, it is important to look for more effective methods of organization and management in terms of the constantly changing macroeconomic factors. It will ensure achievement of the certain strategic goal of enterprises development in terms of the innovation-driven development.

3. Methods

The clauses of the classical and present-day theories of management and development of enterprises, as well as scientific works of scientists on sustainable development, form the methodological basis of the study.

In terms of the study realization we used the following methods: critical analysis and generalization of the theoretical studies (for determination of the trends in sustainable development of the enterprise); economic and statistical (analysis the enterprises performance and formation of the valuation methods of sustainable development of enterprises); factor analysis (identification of the most effective impact factors on sustainable development); mathematical modeling; graphic approach (for visualization of the study findings).

4. Results

The concept of the management mechanism of sustainable development of enterprises and the critical estimation of the management mechanism of sustainable development require some focusing on working out of the specific action-oriented recommendations for its improvement. We believe that the management methods of sustainable development of enterprises are the basis of action-oriented recommendations.

On the basis of the exceptional importance of information as the interconnection foundation between the constituent elements of the management mechanism, we propose to consider the management of information flows in terms of the management mechanism of sustainable development of enterprises.

In addition, it is quite necessary to have the required information on the methods of effective combination of the physical and intangible resources, which contributes to formation of the sustainable competitive advantages. However, the issue of information support of the management mechanism of sustainable development of the enterprise received little attention. The functions of information provision formed into the independent industry, but quite insufficiently structured and integrated into the management system.

Table 1. Classification of the information flows, circulating in the management mechanism of sustainable development of the enterprise (original development)

Classification features	Types of flows	Characteristics of information flows
By the enterprise	Input flows	Market information (prices, product range, number of competitors) Information from suppliers, counterparties (contracts) Customer-related information (demographic, social information, customer satisfaction level) Information from the authorities (civil, labour, tax legislation, tenders for participation in the government programs) Information from the superior management entities (owners of the management company)
	Output flows	Information for suppliers, counterparties (commercial offers, contracts) Customer information (advertising, technical support) Information for the authorities (tax, statistical reporting) Information for the superior management entities
By the management system levels	Horizontal Vertical	Have the coordination nature Depend on the management hierarchy levels
By the management process organization	Motivating Explanatory	Determine the choice of the targeted impact Contain information about the presence, condition and functioning of the system Provide the targeted impact on the controlled object
By the formality level	Formal Informal	Official Informal
By the flow carriers	Verbal Documentary Electronic	Oral In the view of paper documents In the view of electronic documents, messages, transactions

There are many software products on the market of information services, which mainly contribute in closing the gaps in the information technologies of enterprises. At the same time, establishment of software support does not provide any long-running results without the preliminary preparations and adjustment of the organizational system of information support, its coordination with the configuration of the operating and business performance and structure of the enterprise.

Taking into account the urgent need for special technologies of accounting, registration, storage and mobilization of information resources, we propose to highlight the following elements, which form "the structure" of information support for the management mechanism of sustainable development of enterprises.
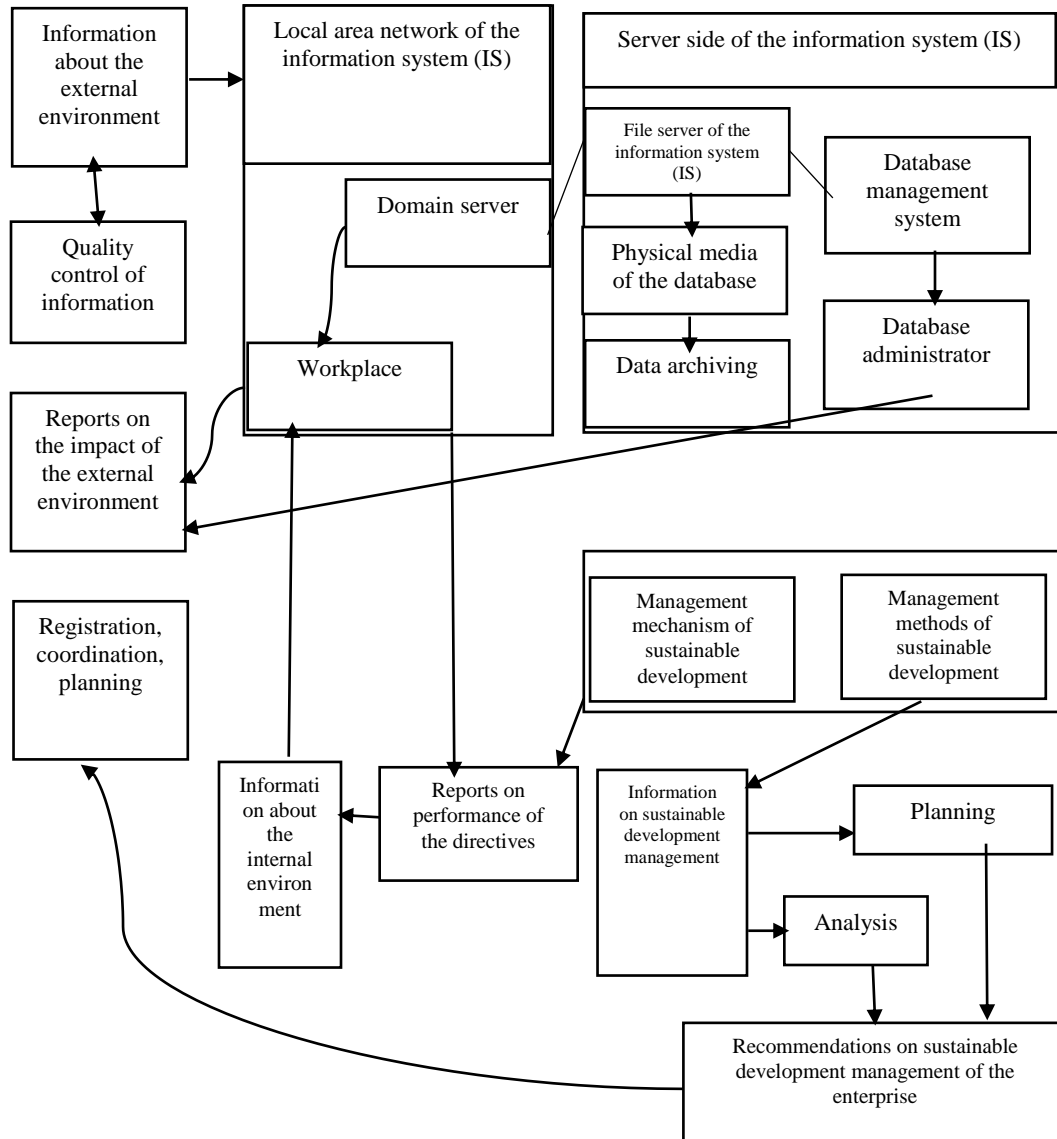
Figure 1. Information system for ensuring the management mechanism of sustainable development of the enterprise
(original development)

In the reporting terms, the information support is designed to synchronize the business objectives and the growing information needs of the enterprise to optimize the IT infrastructure parameters, in order to prevent the structural and managerial crises.

Information assessment is the mechanism that keeps the information support in the updated form. Among the general bunch of information flows in the management mechanism of sustainable development of enterprises, we should highlight two main types (two parameters of the system, which provides management functions), namely: information received from the internal environment of the enterprise, and information received from the external environment of the enterprise.

Therefore, the information flows of the enterprise have both quantitative and qualitative characteristics, which we used for making the classification for improvement of the management mechanism of sustainable development of enterprises (Table 1).

The diagram of the information system for ensuring sustainable development of the management mechanism of the enterprise is illustrated in the Figure 1.

The hardware and software of the enterprise information system is proposed as the basis of the reporting system, which combines into the local area network of the information system. The network consists of the server and front-end sides. The capabilities of the server side of the information system support the functions of the database management system, work with files of the information system, service functions that are associated with data backup, recovery, and archiving.

The front-end capabilities support the operation of application-oriented software, which covers the functions of the enterprise management automation.
The front-end side of the information system consists of workplaces — computers, which have the installed front-end side of the application-oriented software of the information system. There is given a communication between the reporting workplaces (workstations) and the server side of the information system, on the basis of the "client-server" technology.

Also, the information system software installed in the workplaces supports the functions related to sustainable development of the management mechanism. Actually, it is the calculation of all indicators required for the analysis and management of sustainable development, preparation of information and making recommendations in accordance with the methods of sustainable development management.

Workstations software is directly linked to the management mechanism of sustainable development. The reporting connection resides in the fact that the information flow about the condition of environment passes through the application-oriented software of the management automation. The capabilities of such ensuring are usually used for the quality control of information on the external environment, and forming of the reports about influence of the external environment on the enterprise.

5. Discussion

Recognition of the internal actions on sustainable development of the enterprise is usually associated with data that are formed on the basis of the use of the management methods of sustainable development that are applied to real reporting information on the business activities of the enterprise for many previous periods, as well as realization of the directives.

On the other hand, information on the management results of sustainable development is subject to economic analysis. All further work of the enterprise is planned on its basis. The results of the analysis and planning became the basis for development of recommendations for the management of sustainable development of the enterprise. The developed recommendations for the management of sustainable development of the enterprise are subject to registration, they should be taken into account in terms of the coordination and planning of the enterprise for a period ahead. In such case, there is developed the cycle (recursive) closure of the enterprise work: the input information about the past activities of the enterprise and past external influences through its processing in the information system of ensuring the management mechanism of sustainable development, contributes to development of the further recommendations on the business activities of the enterprise. In such recursive closure, working out of the sustainable development management, its realization, monitoring of compliance, analysis of results, and again development of the management recommendations, are actively rotated.

Finally, information about the internal environment, received from the reporting data and through the analysis and planning, enters the information system through the appropriate application-oriented software. In addition, it is subject to registration and coordination with the relevant information regarding the external environment. Thereupon, they produce the revised plans that take into account the external and internal influence on sustainable development of the enterprise.

Thus, ensuring the information support of sustainable development is the functional add-in over the information system of the enterprise. The information support performs the functions of accumulation, analysis, coordination of received data for the automated drawing up of recommendations for the management of sustainable development of the enterprise.

Conclusions

Information receiving and transferring provides the enterprise with the opportunity to obtain the additional value from the internal dissemination of information, the faster access to information and common standards of information exchange. The information infrastructure synchronizes the business objectives and the growing information needs of the enterprise to optimize the IT infrastructure parameters, in order to prevent the structural and managerial crises. Information assessment is the mechanism, which keeps the information support in the updated form.

The study covers the information flows, representing the preparation, realization and control of sustainable development management, and specifies the structure of the system of its information support. As a result, it provided the basis for development of action-oriented recommendations for establishment of the worked out management mechanism of sustainable development in the enterprise information systems.

There was developed the conceptual framework of information support of the management mechanism of sustainable development of enterprises, which allowed ensuring the well-coordinated work of all levers of the structural configuration of the mechanism, as well as understand who manages the mechanism, when they make control, and what levers are used to manage.

On the basis of the complex management methods of sustainable development, modeling of sustainable development, information support of sustainable development, there was improved the management mechanism of sustainable development of the enterprises. The defined management mechanism was proposed to construct as the open management system, which is able to expand and supplement, as well as integrate into the existing information systems.

The information support of sustainable development of the enterprises is the key element of improving the management mechanism of sustainable development of the enterprises. Because without the support, there will be the complete deficit of well-coordinated work of all levers of the structural configuration of the mechanism, or it will not be obvious who manages the mechanism, as well as when and what levers are used to manage.

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HOW ENTERPRISE RISK MANAGEMENT (ERM) CAN AFFECT ON SHORT-TERM AND LONG-TERM FIRM PERFORMANCE: EVIDENCE FROM THE IRANIAN BANKING SYSTEM

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Abstract. Enterprise risk management (ERM) has emerged as a more integrated risk management (IRM) framework in recent years. Many studies have been conducted in recent years to determine the effects of ERM implementation on other parts of an organization. The purpose of this research was to explore the relationship between ERM implementation and organizational performance. The research sample consisted of Iranian banks that either had a license from the central bank of Iran (CBI) or were active in the stock market. A novel measure of ERM implementation was employed in this study. Furthermore, the return on equity (ROE) and Tobin's Q ratio were used as two measures of organizational performance. The results showed that there was a positive and significant relationship between ERM implementation and Tobin's Q ratio, whereas such a significant relationship was not observed between ERM implementation and ROE. The study findings suggested that the adoption of an ERM strategy influences the long-term performance of a firm, not its short-term performance.

Keywords: Enterprise risk management; Organizational risk management; Integrated risk management system; Iranian banking system; Firm performance; Return on equity; Tobin's Q ratio

1. Introduction

Risk management has gained more attention in recent years. Many firms have started to invest a large sum of money in the implementation of IRM programs. Despite the increasing rate of implementing such systems, there

is little information on whether ERM will add further value to firms. Risk management is an important issue for organizations in a dynamic business environment. In recent years, there has been a shift in attitudes toward risk management from addressing it in isolation to a more holistic and system-based view. Although this is a novel approach in Iran, many organizations have attempted to adopt it. Many researches argue that the adoption of ERM improves organizational performance (Barton, Shenkir, & Walker, 2002; Lam, 2014; Lang & Stulz, 1994; Nocco & Stulz, 2006; Gordon, Loeb, & Tseng, 2009; Hoyt & Liebenberg, 2011; Jing, Brockett, & Wang, 2017; Jing, Brockett, Cooper, & Golden, 2012). Many organizations have implemented ERM systems based on the assumption that such systems will enhance their organizational performance. Although empirical pieces of evidence confirm this relationship, the result of previous studies should be interpreted cautiously because of the lack of robust measures of ERM (Hoyt & Liebenberg, 2011).

This research aims to explore the relationship between organizational performance and ERM implementation. To recognize ERM implementation, the first year of implementation and the degree of implementation in each of the studied banks were investigated. The data were collected from pieces of evidence related to 20 active banks in Iran that had implemented an ERM system. These banks had reported the implementation of relevant activities in line with risk management, whereas other banks had not mentioned anything about risk management in their reports. However, there were arguable signs that these banks were implementing some dimensions of ERM .

A novel measure of ERM was employed in this study, in which the ERM-related words in the annual report are identified (Lundqvist & Vilhelmsson, 2018). Although most current accounting studies focus on rigorous data analysis, recent studies have started to realize the significance of unstructured data and eliciting hidden information from them, as a complement to the analysis and interpretation of structured data (Rong, Yang, Manlu, & Kean, 2018).

The degree of ERM implementation varies from time to time and from bank to bank. Therefore, the last two annual reports were used for ERM measurement in each bank. There are too many measures of organizational performance, two of which were employed in this study: ROE as a short-term measure of organizational performance and Tobin's Q ratio as a long-term measure of organizational performance.

2. Literature reviews and hypothesis development

ERM information contained in annual reports helps investors with their investment decisions. ERM is part of a firm's risk management system that provides investors with decision signals. ERM and financial performance cause the transfer of signs and information from well-informed managers to poorly-informed stockholders in order to reduce information asymmetry between them. Positive signals of financial performance and ERM, in turn, may increase the value of a firm. As part of the existing corporate governance mechanism, ERM provides certainty upon the risk undertaken by the management that is referred to as operational certainty in the future, and the agents who deserve to be appreciated for their performance in providing certainty for the future (Agustina & Baroroh, 2016) .

Enterprise risk management (ERM)
Derived from the corporate risk management theory, ERM is defined as a process in which corporate risks (e.g. financial risks, interest rate risks, legal risks, credit risks, etc.) are evaluated and managed in a coordinated and strategic framework. ERM is a fundamental and comprehensive model that has changed from a traditional risk management system into a holistic and more integrated one. Empirical studies on ERM are limited and can be classified into three groups; ERM description, analysis of factors that lead to ERM adoption, and evaluating the consequences of ERM (Eckles, Hoyt, & Miller, 2014).

The present study was mainly focused on two groups of the three ones mentioned above. The dimensions used to measure the degree of ERM implementation were identified. Moreover, the consequences of ERM implementation and its relationship with organizational performance was investigated.

Firm performance
Evidence suggests that enhancing organizational performance will lead to more value creation in organizations (Daley, Mehrotra, & Sivakumar, 1997). Therefore, most studies employ the measures related to value creation to investigate organizational performance. Several studies have used different approaches to the selection of performance variables. Some of them selected the measures of value creation. ROE (Hoyt & Trieschmann, 1991), Tobin's Q ratio, various accounting tools such as return on assets (ROA) and ROE are examples of such measures (Jing, Bajtelsmit, & Wang, 2018) .

Separate management of different risk units can greatly reduce system efficiency due to problems with coordination. Nevertheless, many believe that the organizations where an ERM system is implemented can effectively prevent risk management costs in different departments, due to its holistic and general outlook. Hence, ERM implementation can be synonymous with value creation. In this study, two measures of organizational performance were employed. ROE comes from dividing net profit by book value of stocks. This measure is a short-term indicator of organizational performance and is not able to well represent the organization's long-term performance (Damodaran, 2007) On the other hand, Tobin's Q ratio, proposed by a Nobel prize winner in economics named James Tobin from Yale University, is an indicator of how well an organization's assets are valued at the market. If a firm's market value exceeds its asset value, it indicates that the firm's assets are effectively used. In this case, the stock value surpasses the current value. This occurs whenever Tobin's Q ratio is greater than 1. If a firm's market value is lower than its asset value- that is to say Tobin's Q ratio is smaller than 1- then the firm has fared badly in the matter of effective use of assets .

Unlike ROE, which is focused on a firm's annual performance, this measure deals with a firm's value creation in the long run (Hoyt & Liebenberg, 2011). ROE and ROA are often used as two accounting tools to measure the internal financial performance of a firm. However, Tobin's Q ratio is used to measure the external financial performance of a firm.

ERM and firm performance
When annual reports of a firm show good ERM implementation, it can be stated that the firm is able to manage multiple risks. As a non-financial information package, ERM provides investors with signals related to the security of invested capital. A more obvious presentation of ERM in annual reports of a firm makes investors feel more confident about the security of their capital. Therefore, investors will compete to obtain proper certificates and higher shares of the purchase price. This is consistent with the findings of Liebenberg and Hoyt (2003) who reported that ERM positively and significantly influences a firm's value. Based on their results, ERM accounts for 3.6% of a firm's total value .

On the other hand, investors are willing to both take a lower risk and gain higher return. Batubara et al. (2018) state that firm analysis is one of the crucial steps in making investment decisions. In the firm analysis, investors will evaluate a firm's conditions and performance as a decision criterion. Financial performance provides a firm's true profile information and evidence of management efficiency in managing the available capital as the third party. Financial performance is an important signal in making investment decisions. Profitability is a reflection of a firm's operational activities and its ability to generate profits. Based on the owned capital, asset is a measure of assessing a firm's performance in a certain period. Then the assumption is that profitability positively influences a firm's value .

So far, we have reasoned that ERM implementation will positively influence a firm's value, and a firm's value is increased by its profitability. Then our hypothesis is that there is a positive relationship between ERM implementation and a firm's financial performance. Although several studies have investigated this relationship, their contradictory results have not led a unanimous conclusion. This difference can be partially attributed to the fact that previous studies did not make a distinction between the short-term and long-term performance of a firm. Our study will add to previous studies by exploring this relationship in the Iranian banking system, considering the paucity of studies conducted on this subject and their contradictory results. In addition, our study will make a distinction between the short-term and long-term performance of a firm. The first step to test the hypothesis is to specify the best measures of firm performance. To this end, we make a distinction between a firm's short-term and long-term performance. ROE is equivalent to the annual net income of shareholders divided by shareholder value. This index will measure the short-term performance of a firm. Agustina and Baroroh (2016) investigated the relationship between ERM and firm performance in Indonesian 53 banks from 2011 to 2013. They employed ROE to measure firm performance. Their results indicated that there is no relationship between ERM and ROE. However, we will measure this relationship in the Iranian banking system in order to determine whether there is a positive relationship between a firm's short-term performance and ERM implementation.

H1: There is a positive relationship between ERM implementation and a firm's short-term financial performance measured by ROE.
In the next step, we represent Tobin's Q ratio as a measure of long-term performance. Tobin's Q ratio equals the sum of the market value of equity and book value of liabilities by the book value of total assets. Pagach and Warr (2010) studied the effect of ERM principles on a firm's long-term performance and found that the firms adopting an ERM system undergo a reduction in stock price volatility. In another study, Hoyt and Liebenberg (2011) measured the relationship between ERM implementation and firm performance in the US insurance market by using Tobin's Q ratio as a standard measure of firm performance. Their results indicated that there is a positive relationship between ERM and Tobin's Q ratio. Based on what discussed above, the next research hypothesis is as follows:
H2: There is a positive relationship between ERM implementation and a firm's long-term financial performance measured by Tobin's Q ratio.
In addition to making a contrast between a firm's short-term and long-term performance, a novel approach to the measurement of ERM implementation (Lundqvist and Vilhelmsson, 2018) was employed in the present study. To measure the degree of ERM implementation, the words related to ERM implementation were searched on annual reports of the studied banks.

3. Sample and measurement

In the first step, all licensed banks in Iran were recognized. There were 37 licensed banks in Iran, 31 of which were Iranian banks. Of these 31 banks, 8 were public, 21 were private, and 2 were no-profit. In addition, annual reports of 24 for two fiscal years of 2014 and 2015 were available. Based on these reports, the degree of ERM implementation was measured .

To gain access to annual reports of banks, the websites of all studied banks as well as www.codal.ir were searched. In cases where there was no annual report of a bank on the website, the annual report was directly requested from them by email or telephone .

Tobin's Q ratio and ROE were used as two discrete and separate measures of firm performance. The value created by a firm is needed when measuring Tobin's Q ratio. Hence, this was calculated for the banks that were a public company and were priced in the exchange market. Of the 24 banks whose annual reports were available, 4 banks were not a public company and therefore could not be included in the sample. Therefore, the final sample size was

equal to 20. The average market value of a firm in a year was used in the numerator of Tobin's Q ratio formula to analyze firm performance .

Measuring the degree of ERM implementation
The results showed that public disclosure of financial, strategic, and operational risks has a positive and significant relationship with financial statements (Rong et al., 2018). Hoyt and Liebenberg (2011) argue that firms generally do not disclose if they are managing risks in an integrated manner and the majority of risk management disclosure is related to specific risks. Therefore, it is difficult to maintain if a firm is implementing ERM. Therefore, to measure the degree of ERM implementation, we ought to employ an approach that makes use of information that organizations had disclosed. The tool used to measure the degree of ERM implementation in this study takes into account different dimensions of ERM: from the most basic risks to the organization to the control of the risk management system.

A comprehensive list of the dimensions of ERM implementation was extracted from the findings of Lundqvist and Vilhelmsson (2018), Desender (2011), and Lundqvist (2014). Such a list is assumed to be necessary for the correct assessment of the degree of ERM implementation. The dimensions used in this study reflect COSO's eight components of ERM implementation. This framework states that when all of the eight components are present and functioning properly, an entity of any size can run an effective ERM system. Lundqvist and Vilhelmsson (2018) employed identical dimensions in a survey to develop the pillars of ERM. They also state that all four pillars should be represented when attempting to measure the ERM implementation level. All dimensions proposed by Lundqvist and Vilhelmsson (2018) are given equal weight .

In this study, we searched the bank's annual reports for each of the 83 dimensions of ERM implementation. As a single word hardly represents an ERM dimension, we searched for word combinations. Additionally, some dimensions may be represented by more than one set of word combinations. For example, some dimensions in this study were represented by more than one set of word combinations. In these cases, the existence of any of those combinations indicates the presence of those dimensions. Therefore, it could be said that there exists "OR" between the set of word combinations in one dimension (Lundqvist & Vilhelmsson, 2018) .

Because of the difference between English and Persian languages and as sometimes there may exist many translations for a single word in Persian, the number of word combinations in some dimensions differs from those of English. However, these words were chosen meticulously by reviewing the risk-related annual reports of the studied organizations. There exist many examples of such translations and different sets of word combinations. Another point considered in using this approach is that the words searched for in annual reports were regarded as a dimension of ERM only when they were part of the bank's main programs and activities .

The total number of dimensions existing in annual reports indicates the degree of ERM implementation in a bank in a fiscal year. When the number of the set of word combinations considered, then one dimension is given more weight than others. That is not because the word or the word combination is more important, but it is just more prevalent. As previously mentioned, all dimensions were given equal weight, therefore the presence of any of the word combinations in an annual report gives that dimension a score of 1 and, reasonably, 0 if there are not any of such word combinations. Consequently, the degree of ERM implementation varies from 0 to 83 (Lundqvist and Vilhelmsson, 2018) .

It is arguably reasonable and expected that banks will be gradually more and more familiar with ERM and, as a result, the degree of ERM implementation increases over time. In this research, the mean degree of ERM implementation was 22.6 for 2014 and 24.7 for 2015. The mean degree of ERM implementation for Iranian banks is much lower than that of the major banks around the world, which has been estimated at 47.5 for the period 2005-2011 (Lundqvist and Vilhelmsson, 2018) .

Some of the ERM implementation dimensions were found in annual reports of none of the studied banks. These dimensions included chief risk operator (CRO), access to capital market, criteria accepted for results evaluation, compensation policies for aligning share of managers and stockholders, physical control, foreign transfer rate, response to risk program, internal auditing budget, acquisition threat, centralized technology for risk information, compliance with voluntary protocols, alternative response to risk, customer information privacy, and centralization of production location. Some dimensions were present in all banks in both years. These dimensions were protection and health issues, training, leadership and training programs, and liquidity .

The lowest and the highest degrees of ERM implementation in this study were 11 and 34, respectively.

Measuring the depth of ERM implementation
Because firms do not disclose the exact level of their risk management activities, according to Hoyt and Liebenberg (2011) and Pagach and Warr (2011), we searched for a specific set of words or synonyms of enterprise risk management, strategic risk management, and IRM system. Any encounter with these words was reported with one extra variable (depth) and then it was coded. For example, when Firm A begins to implement an ERM system in the first year, the depth of ERM will be 1 for that year. On the other hand, for the firms that have not yet begun to implement ERM, the depth will be zero. Reasonably, this figure for firms that have begun to implement ERM for the first year will be 2 in the second year (Lechner and Gatzert, 2018) .

Firm performance
We sought the answer to two questions in this approach: first, whether ERM is a function of ROE for Iranian banks? And second, whether ERM is a function of Tobin's Q ratio for Iranian banks? If we just explore these two questions without considering other variables that could affect ERM, we might answer these questions erroneously. Then, we ought to control other factors that could affect ERM and has a relationship with ROE or Tobin's Q ratio. For this reason, we controlled 5 factors that will be later discussed in detail.

Return on equity
To calculate the ROE of firms in each fiscal year, financial statements of the studied banks were reviewed and analyzed using the online Bourse View application. ROE is equivalent to the net income of shareholders in a year divided by shareholder value. In other words, this index measures a firm's efficiency in gaining profit from shareholder's money.

Tobin's Q ratio
Financial statements of banks and www.codal.ir were reached to find Tobin's Q ratio of studied banks in each fiscal year. Tobin's Q ratio is achieved by dividing the sum of the market value of equity and book value of liabilities by book value of total assets.

ERM determinants
Size
Since larger firms are more complex, they may face a wider range of risks. In addition, those have the institutional size to support the administrative cost of an ERM program are more likely to engage in the ERM program. This is corroborated by research evidence. The natural log of the book value of assets was employed in this study as an index of firm size. On the other hand, Lang and Stulz (1994) and Allayannis and Weston (2001) have found the negative relationship between firm value and firm size. Based on the evidence, it is promising to include firm size as a control variable in our relationship .

Leverage
Leverage is defined as the ratio of the book value of assets to the book value of liabilities. High leverage greatly increases firm value and decreases the free flow of liquidity, unless it is invested in promising projects. On the other hand, extreme degrees of leverage might lead to bankruptcy or greatly increase its probability. The firms implementing ERM may have lower financial leverage if they decide to lower the probability of financial distress by decreasing financial risk. However, those firms that make such a decision may assume greater financial risk. These arguments justify the use of firm leverage as a control variable in the relationship (Jensen, 1986).
Return on assets (ROA)

Profitable firms are rewarding more than others (Allayannis and Weston, 2001). ROA is used as a measure of firm profit and is defined as a ratio of net profit to total assets. It is expected that there is a positive relationship between ROA and Tobin's Q ratio.

Opacity
According to Pagach and Warr (2011), opacity refers to the ratio of intangible assets to the book value of total assets. Hoyt and Liebenberg (2011) argue that the relatively opaque firms should gain greater benefit from ERM programs that communicate the objectives of risk management and strategies with outsiders. Pottier and Sommer (2006) state that more opaque firms are those that are more default for outsiders to evaluate them. Pagach and Warr (2011) hypothesized that ERM implementation is related to the opacity of the firm's assets because relatively opaque assets are more difficult to liquidate to avert financial distress .

Value Change
Value Change is measured as the one-year percentage change in a firm's market value. In addition, market value is calculated by multiplying the year-end shares of outstanding and closing stock price. Pagach and Warr (2011) showed that ERM implementation may be related to a sharp decline in shareholder value in firms that feel pressure to convey to shareholders that they are taking corrective steps to prevent continued value reduction .
As previously mentioned in this paper, firms should gradually implement an ERM system over time. Finally, the dummy variable of the year is included in the regression to control time variation to adopt ERM (Hoyt & Liebenberg, 2011).

4. Models and results

When we specify ROE as a dependent variable, the degree of ERM implementation, size, leverage, opacity, ROA, and value change, and depth are considered the control variables. Additionally, year dummy controlled variations in time. In other words, our model is as follows:

ROE = f (ERM, Size, Leverage, Opacity, ROA, Valuechange, Depth)   (1)

On the other hand, when regressing Tobin's Q ratio on ERM, size, leverage, Opacity, ROA, and value change are controlled for. Besides, the year dummy controlled for variations in time .

Q = f (ERM, Size, Leverage, Opacity, ROA, Valuechange, Depth)   (2)

Summary statistics for year 2014 and year 2015 is provided in Table 1 and Table 2 respectively.

Table 1. Summary Statistics for year 2014

	Banks Implemented ERM (6 banks)			Banks not implemented ERM (14 banks)		
	Mean	Median	*Standard error*	Mean	Median	Standard error
ERM	*23.6667*	24	*3.141*	21.7143	21.5	6.402
ROE	*0.167*	0.217	*0.170*	0.023	0.146	0.351
Q	*1.008*	1.007	*0.048*	1.024	1.011	0.027
Size	*33.278*	32.971	*0.817*	32.545	32.377	1.211
Leverage	*12.669*	13.314	*5.458*	21.248	13.624	24.910
Opacity	*0.947*	1.056	*0.671*	1.137	0.566	1.258
ROA	*1.052*	0.989	*1.248*	0.724	0.750	1.645
ValueChange	*0.263*	0.222	*0.450*	-0.047	0.000	0.354

Table 2. Summary Statistics for year 2015

	Banks Implemented ERM (9banks)			Banks not implemented ERM (11 banks)		
	Mean	Median	Standard error	Mean	Median	Standard error
ERM	25.4444	26	4.733	24	23	6.542
ROE	0.105	0.133	0.113	0.031	0.077	0.284
Q	1.008	1.003	0.021	1.024	1.006	0.036
Size	33.502	33.046	0.924	32.685	32.455	1.088
Leverage	21.331	13.934	15.249	34.635	16.336	48.002
Opacity	0.800	0.957	0.555	1.277	1.486	1.129
ROA	0.688	0.400	0.993	0.825	0.407	1.156
ValueChange	-0.363	0.078	0.646	-0.721	-0.789	0.236

Correlation between variables and checking assumptions
As shown in Table 3, the correlation between variables was calculated. The results indicated that ROE and ROA had a positive and significant relationship with the degree of ERM implementation and firm size. In addition, the degree of ERM implementation strongly and positively correlated with Tobin's Q ratio, opacity, and ROA. Tobin's Q ratio also had a positive correlation with ERM and highly correlated with opacity. Table 3 shows the correlation between all research variables.

Table 3. Variable Correlations

Correlation	ROE	ERM	Depth	Q	Size	Leverage	Opacity	ROA	ValueChange
ROE	1								
ERM	0.285	1							
Depth	0.229	0.122	1						
Q	0.086	0.428	-0.166	1					
Size	0.277	-0.038	0.272	-0.456	1				
Leverage	-0.270	-0.307	-0.183	-0.355	-0.010	1			
Opacity	0.0998	0.392	-0.074	0.533	-0.220	-0.431	1		
ROA	0.631	0.435	0.182	0.271	0.138	-0.335	0.350	1	
ValueChange	0.190	-0.090	0.213	0.017	0.370	-0.260	0.061	0.257	1

Also, we check for assumption of normality of reseduals and it is supported by Kolmogorov-Smirnov (Pvalue=0.123>0.05) and Shapiro-Wilk (Pvalue=0.462>0.05).

ROE and the degree of ERM implementation

Table 4 is an OLS regression to estimate the relationship between ROE, as a short-term measure of firm performance, and the degree of ERM implementation. In this study, we estimated the bootstrapped standard errors with 1000 repetitions to compensate partially for the lack of sufficient data, resulting from the low number of Iranian banks that are licensed by CBI or are active in the stock market. All data related to 2014 and 2015, shown in columns 1, 2, and 3, were used to estimate the regression. Columns 4, 5, and 6 present the data of 2014 and the last three columns show the data of 2015. Specifications 1, 4, and 7 show the estimates of ROE as the sole function of the degree of ERM implementation. In columns 2, 5, and 8, we added all control variables except ROA and the depth of ERM implementation. Finally, in 3, 6, and 9, all control variables were added to the regression. When we regarded ERM as a sole determinant of ROE and employed the whole dataset (Column 1), the relationship was statically significant. In other columns, there was no significant relationship between the degree of ERM implementation and ROE. Therefore, the first hypothesis is not confirmed and it cannot be stated that there is a positive and significant relationship between the degree of ERM implementation and ROE.

The heteroscedasticity of the regression model was also tested in this study. Thre conventional tests, namely the Breusch-Pagan test (Pvalue=000<0.05), the White test(Pvalue=0.381>0.05) and modifed Breusch-Pagan test(Pvalue=0.191>0.05), produced contradictory and mix results about the existence of heteroscedasticity. The results of the Breusch-Pagan test suggested significant heteroscedasticity in our model, whereas the White test showed the opposite. In cases that the heteroscedasticity is established, standard errors are estimated higher than the reality, and this causes downward bias in estimating t-values. We needed to find robust standard errors to address the problem. Since there were signs of strong heteroscedasticity- which violates one of OLS assumptions- based on the results of the White test, we included OLS regression with robust standard errors in Table 5. The results did not vary significantly from our results in Table 4, except for the fact that standard errors in Table 5 were lower than that of Table 4.

Table 4. ROE Sample- OLS Regression Results

Explanatory Variable	All data			Year 2014			Year 2015		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ERM	*.01309	.01265	.00156	.01665	-.00272	-.01400	.01090	.01380	.00860
	(.0067)	(.0102)	(.06302)	(.011)	(.0174)	(.0656)	(.0881)	(.0147)	(.0122)
Size		.06744	.04676		.11386	.06341		-.00482	.06602
		(.0678)	(.0630)		(.0869)	(.3329)		(.1023)	(.111)
Leverage		-.00162	-.00106		-.01012	-.010275		.00067	.00072
		(.00352)	(.0034)		(.00795)	(.01674)		(.0059)	(.0068)
Opacity		-.00789	-.03567		-.00015	-.02341		-.03506	-.09602
		(.05811)	(.1314)		(.0883)	(.1715)		(.111)	(.1123)
ValueChange		.03818	-.03059		.23010	.13870		.03468	-.19839
		(.13084)	(.1314)		(.1723)	(1.847)		(.333)	(.3879)
ROA			*** .1314			. 10217			.17464
			(.0328)			(.2428)			(.1429)
Depth			.00756			-.01090			.01612
			(0.170)			(.1608)			(.0599)
R^2	0.0787	0.2033	0.4578	0.0900	0.7803	0.8870	0.0792	0.1211	0.5533
Adjusted R^2	0.0545	0.0748	0.3269	0.0395	0.6805	0.7991	0.0280	-0.1928	0.2928
Number of observations	40	37	37	20	17	17	20	20	20

Note: Numbers in the parentheses are standard errors of coefficients. The dependent variable is return on equity. ERM is the degree of enterprise risk management implementation. Control variables are explained in detail in previous parts of the paper. *Denotes significance at the 10% levels, **5% level and *** 1% level based on bootstrapped standard errors.

Table 5. ROE Sample- OLS Regression Results (Robust standard errors)

Explanatory Variable	All data			Year 2014			Year 2015		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ERM	*.01309	.01265	.00156	.01665	-.00272	-.01400	.01090	.01380	.00860
	(.0066)	(.0097)	(.0069)	(.010)	(.0129)	(.0136)	(.0852)	(.0145)	(.0085)
Size		.06744	.04676		.11386	.06341		-.00482	.06602
		(.0666)	(.0602)		(.0611)	(.0436)		(.0457)	(.062)
Leverage		-.00162	-.00106		***-.01012	***-.01027		.00067	.00072
		(.00265)	(.0024)		(.002693)	(.00252)		(.00069)	(.00069)
Opacity		-.00789	-.03567		-.00015	-.02341		-.03506	-.09602
		(.05702)	(.0456)		(.0726)	(.0349)		(.095)	(.0905)
ValueChange		.03818	-.03059		***.23010	**.1387		.03468	-.19839
		(.1326)	(.1275)		(.0787)	(.0506)		(.119)	(.1106)
ROA			*** .1314			.10217			.17464
			(.0275)			(.2354)			(.0879)
Depth			.00756			-.01090			.01612
			(.144)			(.021)			(.02197)
R^2	0.0787	0.2033	0.4578	0.0900	0.7803	0.8870	0.0792	0.1211	0.5533
Number of observations	40	37	37	20	17	17	20	20	20

Note: Numbers in the parentheses are standard errors of coefficients. The dependent variable is return on equity. ERM is the degree of enterprise risk management implementation. Control variables are explained in detail in previous parts of the paper. Standard errors are calculated using robust inference. *Denotes significance at the 10% levels, **5% level and *** 1% level based on bootstrapped standard errors.

Tobin's Q ratio and the degree of ERM implementation

Table-5 is an OLS regression to estimate the relationship between Tobin's Q as long term performance metrics and the degree of ERM implementation. In this table, we estimated the bootstrapped standard errors with 1000 repetitions to compensate partially for the lack of sufficient data, resulting from the low number of Iranian banks that are licensed by CBI or are active in the stock market. All data related to 2014 and 2015, shown in columns 1, 2, and 3, were used to estimate the regression. Columns 4, 5, and 6 present the data of 2014 and the last three columns show the data of 2015. Specifications 1, 4, and 7 show the estimates of ROE as the sole function of the degree of ERM implementation. In columns 2, 5, and 8, we added all control variables except ROA and the depth of ERM implementation. Finally, in 3, 6, and 9, all control variables were added to the regression. All three datasets indicated that there was a positive and significant relationship between the degree of ERM implementation and Tobin's Q ratio without control variables. When we added control variables, shown in columns 2 and 3, the results were still statistically significant. Although the results were not as strong as claimed, the regression results approved the positive relationship between the degree of ERM implementation and Tobin's Q ratio. Furthermore, we examined the possibility of heteroscedasticity. We tested the null hypothesis, indicating that there is no heteroscedasticity, using the Breusch-Pagan test (Pvalue=0.798>0.05) , the White test(Pvalue=0.522>0.05) and the Modified the Breusch-Pagan test (Pvalue=0.472>0.05) . The results of both tests do not rejected the null hypothesis. Therefore, there was no need to calculate robust standard errors for this regression.

Table 6. Tobin's Q ratio Sample- OLS Regression Results

Explanatory Variable	All data			Year 2014			Year 2015		
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*
ERM	***.00242	*.00141	*.00141	***.0027	.00095	.00158	**.00257	.00132	.00134
	(.00077)	(.0008)	(.00085)	(.0008)	(.0016)	(.00088)	(.0013)	(.001)	(.0017)
Size		***-.01207	***-.01154		-.00717	-.00587		-.01867	-.01827
		(.0041)	(.0043)		(.0094)	(.0437)		(.115)	(.0175)
Leverage		-.00010	-.00012		-.000030	-.00036		.00003	9.14e-06
		(.00019)	(.00023)		(.00117)	(.0028)		(.0006)	(.00078)
Opacity		*.00718	.00618		.00396	.00287		*.01246	-.01201
		(.0037)	(.0045)		(.00896)	(.0241)		(.0067)	(.0128)
ValueChange		.0082	.00836		.2254	.0303		.01289	.01385
		(.00065)	(.0074)		(.0262)	(.2413)		(.0255)	(.0436)
ROA			.00139			-.00277			-.00044
			(.0040)			(.0321)			(.014)
Depth			-.0022			-.00351			-.00136
			(0.0022)			(.0212)			(.0045)
Year dummy is added	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
R²	0.2364	0.5109	0.5293	0.3239	0.5069	0.5671	0.2305	0.6656	0.6719
Adjusted R²	0.2158	0.4320	0.4156	0.2842	0.2828	0.2304	0.1878	0.5462	0.4806
Prob > chi2	0.0017	0.0001	0.0007	0.0012	0.4803	0.9873	0.0444	0.0104	0.5567
Number of observations	39	37	*37*	19	17	17	20	20	20

Note: Numbers in the parentheses standard errors of coefficients. The dependent variable Tobin's Q ratio. ERM is the degree of enterprise risk management implementation. Control variables are explained in detail in previous parts of the paper. *Denotes significance at the 10% levels, **5% level and *** 1% level based on bootstrapped standard errors.

Conclusion

The study findings provide some evidence of the effect of ERM implementation on firm performance in the Iranian banking system. The degree of ERM implementation was measured by a novel method, in which 83 dimensions of ERM implementation were searched for in annual reports of banks. In addition to the degree of ERM implementation, the depth of ERM implementation, which is the number of years elapsed from the beginning of ERM implementation in a bank, was calculated in this study. However, there was a significant relationship between this measure and none of the important variables .

The firm performance was measured by using two measure. ROE is an internal measure of a firm's financial performance and an indicator of short-term performance. On the other hand, Tobin's Q ratio is an indicator of long-term performance and an external measure of a firm's financial performance .

To measure the effect of ERM implementation on Iranian banks, we employed OLS regression from the data related to two consecutive years. The data were analyzed in STATA. The results indicated there was no significant relationship between the degree of ERM implementation and ROE. In addition, there was a significant relationship between the degree of ERM implementation and Tobin's Q ratio when we measured Tobin's Q ratio separately as a function of ERM. This significant relationship was also true when we added the control variables.
The results regarding the effects of the degree of ERM implementation on two measures of firm performance were contradictory. When the banks were assigned to two groups based on ERM implementation, there was a significant relationship between the degree of ERM implementation and Tobin's Q ratio in none of the groups. Furthermore, when we defined a dummy variable indicating ERM implementation in firms, there was no significant difference between the two groups in terms of in Tobin's Q ratio and ROE, regardless of other variables such as firm size, leverage, etc. Based on the results, it was concluded that the degree of ERM implementation determines Tobin's Q ratio, not merely ERM adoption. The other fact is that the depth of ERM implementation in none of the banks in that sample was not more than 5 years. This can justify our results indicating that ERM implementation and the depth of ERM implementation had no relationship with Tobin's Q ratio .

Previous studies did not make a distinction between the short-term and long-term performance of a firm in exploring the relationship between ERM and firm performance. Although some studies have reported a positive relationship between the degree of ERM implementation and long-term performance of a firm-which is limitedly corroborated by our findings- no significant relationship has been observed between the degree of ERM implementation and short-term performance of a firm. The study findings do not prove such a relationship. The results of this study are consistent with previous findings about the effect of the degree of ERM implementation on long-term performance of a firm, while the relationship between short-term performance of a firm and the degree of ERM implementation has not been fully proved yet .

In addition to the main results, the means and the median of banks in both groups were measured for each fiscal year. The results are consistent with the findings of previous studies. ROE, the degree of ERM implementation, firm size, and value change all are greater for banks that had begun to implement an ERM system.

Limitations and recommendations

Since ERM implementation in Iranian banks does not follow a random process, there are confounding variables that differentiate between treatment and control groups (banks that implemented ERM and those did not). It is hence necessary to control these confounding variables. If the banks were randomly selected to implement ERM, it would be much easier to determine causal inference of the effect of ERM implementation on firm performance and there would be no need to control other variables in the model. However, conducting such a study is impossible, given the fact that adopting ERM is part of a firm's strategic decisions. Although some control variables were employed in this study to correctly measure the relationship between ERM and firm performance, we could add some other variables to the regression model. For example, Lundqvist and Vilhelmsson (2018) controlled total assets, tier 1 ratio, nonperforming loans, provision for loan losses, audit committee independence, corporate governance score, and single best owner in their study to measure the relationship between the degree of ERM implementation and credit default swap (CDS). Hoyt and Liebenberg (2011) employed firm size, leverage, ROA, percentage of outstanding shares owned by insiders, percentage of shares owned by institutions, sales growth, slack, opacity, value change, CV (EBIT), and beta as control variables. Although we did not add some of these variables to our regression model, the low correlation between these variables and the degree of ERM implementation, ROE, and Tobin's Q ratio, respectively, suggest that omission of these variables from our model would not be a remarkable source of bias .

Another source of bias in our results was related to the measurement error. Measurement error results in attenuation bias that will lead to the calculation of undervalued coefficients. The best possible way to address the problem is to use another measure of the degree of ERM implementation as an instrument variable. Therefore, future studies are recommended to use another measure of the degree of ERM implementation and compare the results with this study to obtain a clearer picture of the situation .Some other measures of ERM is ERMI (Gordon, Loeb&Tseng, 2009) and ERM rating (McShane, Nair&Rostambekov, 2011).

The other possible and important source of bias in our results was the reverse causality. We argued that both ROE and Tobin's Q ratio are the function of the degree of ERM implementation. In other words, implementing an ERM system will lead to higher levels of both ROE and Tobin's Q ratio. However, a reverse argument in this regard could be that the degree of ERM implementation is a function of both ROE and Tobin's Q ratio. Speaking loosely, this might be the case when firms with better performance -evidenced by higher degrees of ROE and Tobin's Q ratio as two measures of firm performance- implement an ERM system more readily and likely than those with poorer financial performance. The existence of simultaneity would bias the coefficient upward and against finding the correct relationship. Finding a suitable instrument variable in order to correct such endogeneity problem helps to alleviate the problem in the future, although is difficult and might have some disadvantages .

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OUTSOURCING OPTIMIZATION MODEL IN THE RUSSIAN CAR INSURANCE MARKET

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Abstract. Outsourcing is a popular management strategy aimed at optimizing the operation of various organizations, including insurance companies all over the world. However, the involvement of an intermediary between insurance parties does not only serve to improve the efficiency of the insurer's business operations, but also poses extra risks. This article proposes a risk optimization model regarding the insurer's risks when outsourcing certain operations. The model was analyzed on the example of car insurance using the Russian insurance market data (the Ingosstrakh Insurance Company). To our opinion, the presented optimization model is capable of bridging the gap in the insurance theory and lay a foundation for further economic studies of insurance intermediaries. The model was tested with the data of Russian insurers and showed that outsourcing in the current insurance market of comprehensive car insurance cover is unprofitable due to a high concentration of fraud. We calculated the optimal threshold for fraudulent payouts in car insurance, which should be as low as 0.64%. The proposed hypothesis for further research consists in the following: In terms of the ratio of profitability and risk, selling insurance policies through intermediaries can be profitable for insurance companies with respect to inexpensive insurance products only.

Keywords: insurance; outsourcing; risks; optimization model; insurance intermediary; fraud; Markov analysis

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JEL Classifications: G22, G32.

1. Introduction

The effective management of the insurance company is creating an effective insurance organization and adjusting it in accordance with the changing tasks and circumstances of the insurance market. Unpredictability of a possible result, i.e. its risky nature is a characteristic feature of the insurance market. In the international market, entrepreneurs are constantly looking for ways to save money, improve the quality of their products and services, and improving their business performance in order to keep business and to compete successfully (Hilkevics, Semakina 2019; Prodani et al., 2019).

The theory of business management suggests that the majority of companies, both large and small ones, can enjoy significant competitive advantages through outsourcing (Heywood 2002, p. 37). Outsourcing is a business paradigm in which an organisation transfers part of its business processes to a service provider (Zitkiene, Dude 2018; Corrigan 2019). Outsourcing enables the insurance companies to perform their daily functions by forming a solid basis of profitability and growth (MOS Team 2019). It means that the outsourcing of various functions that are not directly related to the formation of the insurance product is used as an important factor in reducing the costs of the insurance company. In order to increase the return on capital employed, managerial accounting prefers to increase inventory turns and reduce working capital. This may, however, be achieved at a higher total direct cost where the labor is the most significant cost differentiator between the local manufacture and outsourcing to low-labor-cost regions (Newlands, AL-Husan 2019).

In reality, the insurance companies delegate some operations to other companies in pursuit of improving their operating efficiency. This delegation of some operations, the outsourcing, allows providing continuity, trancperancy and quality of the business processes. While the banking and telecommunication sectors pioneered this area, the insurance sector companies rather unwillingly consider and implement outsourcing under the market pressure, in order to improve their efficiency or even "restructure their value chains" (Vagadia 2012). Insurance coverage is a critical service that companies offer to consumers to safeguard against financial loss in the event of unforeseen circumstances such as illness, natural calamity and vehicular accidents. Property and casualty insurance (P&C) outsourcing involves providing outsourcing services such as consulting, technology enablement and managed services across areas like auto, theft, property and natural calamities (Vones et al. 2019).

A vivid example of outsourcing in the insurance sector is selling insurance products through non-salaried insurance salesmen and persons fulfilling their function. However, this poses the question whether it is reasonable to outsource elements of the main activity, but not some secondary operations, such as accounting or IT services, which is particularly relevant for SMEs (Grama, Păvăloaia 2014).

In this study, we proposed a tool for insurers to calculate the benefits of outsourcing certain operations based on the ratio of profitability of the operation and the risk posed by the intermediary involvement. The common advantages and disadvantages of the outsourcing are given in the table below (see Table 1).

Table 1. The advantages and disadvantages of the outsorcing

Advantages	Disadvantages
The financial benefit: there are no payments related to dismissal, compensation for unused vacation, maternity, sick leave, etc. Also, the contractor uses its own equipment, office etc.	The information leakage risk. It is quite hard to to control the safety of the confidential information in the other company (To reduce this risk the inssurance company should put it into the agreement or contract and to underline the responsibility for sharing the confidential information)
The reducing the workload of the human resources department	The reliability of the partner. If the partner will not be reliable or will go broke it wqill influene negatively on the insurance company reputation and the clients
The company is insured against suspension of services due to illness or the sudden dismissal of employees.	
It is easier to dismiss an employee who does not work fror the company directly and it is easier to find a new employee	

Source: compiled by the author

2. Literature review

The efficiency of business operations of insurance companies and methods of their improvement are the subjects of study for researchers in various countries (Chen et al., 2011; Biener et al., 2016; Hsieh et al., 2014). They consider outsourcing as one of the methods for improving operating efficiency, cost reduction, and for risk

mitigation, as well as a tool for "ensuring viability, building a system of long-term and mutually beneficial relationships in a business..." (Veretnov 2009, p. 67). Some studies deal with risk management from the quality (Mao et al. 2018) and quantity (Zou, Cadenillas 2014) points of view. It should be realized that involvement of intermediaries in the insurance business adds extra risks that require being studied additionally. Reducing the risks means the reduction of the extent of the possible damage or the possibilities of the adverse events.

Previously, Russian academic economists mostly studied outsourcing-related opportunities and risks in the insurance market by the dialectical and general scientific methods of cognition (Gukova et al. 2016), as well as surveyed the statistical data of insurance companies by the econometric approach (Trifonov 2015). This article suggests using the quantitative methods for assessing insurer's risks that arise when certain operations are outsourced to intermediaries.

3. Methodology

Considering that the market of the insurance service for the clients is developing and growing (see Table 2), the companies need the trustful instrument of growing the profits and lowering the risks.

Table 2. The profit of the insurance companies in Russia (from 2013 to 2018)

Year	Billion of rubles
2013	31.2
2014	59.7
2015	91.2
2016	82
2017	84
2018	165

Source: Central Bank, 2019

The risk management involves its identification, assessment and development of measures to reduce the likelihood of its implementation and the amount of damage that will arise in case of its implementation. We have already proposed to use Markov chain method to assess the risks arising when certain operations are outsourced by the insurer (Markov 1924; Kozminykh 2017; Troffaes et al. 2019). The method of the risk assessment, based on the usage of Markov chain, looks like the traditional analysis of the reliability, described by Terje Aven in his work: "Risk assessment and risk management: Review of recent advances on their foundation" (Aven 2016). Our analysis based on the data on the development of the Russian insurance market, as well as insurance-related fraud data on the example of the Ingosstrakh Insurance Company showed that outsourcing insurance policies is currently unprofitable in terms of revenues and risks. This is due to the high level of fraud in the insurance market (Churilov 2014; Krawczyk 2009). The quantitative (mathematical and statistical) methods of fraud detection in car insurance have been a relevant subject for research for the recent years (Nian et al. 2016; Subudhi, Panigrahi 2017).

The purpose of our study is to propose a model for optimizing profitability and risk when outsourcing certain insurers' operations. As the main indicators, we chose the ratio of profitability and risk, expressed with the coefficient of variation. The model can be formulated as follows (1):

$$|V1| <= |V2|$$ (1)

where V1 is the coefficient of variation for outsourcing an operation,
V2 is the coefficient of variation or the accomplishment of the operation by the insurer.

The coefficient of variation shows what share of the average value of this magnitude is comprised by its average range of variation. The coefficient of variation is found as the ratio of the standard deviation and average expected value, and can be formulated as follows (2):

$$\sigma 1 \,/\, |\bar{X}1| <= \sigma 2 \,/\, |\bar{X}2| \tag{2}$$

where $\sigma 1$ is the standard deviation for outsourcing the insurer's operation;
$\bar{X}1$ is the average expected value for outsourcing the insurer's operation;
$\sigma 2$ is the standard deviation for the accomplishment of the operation by the insurer;
$\bar{X}2$ is the average expected value for accomplishment of the operation by the insurer.

After basic mathematical transformations, the optimization model takes on the form of the following equation (3):

$$\sigma 1 * |\bar{X}2| - \sigma 2 * |\bar{X}1| <= 0 \tag{3}$$

The average expected value $\bar{X}$ is calculated with the following formula (4):

$$\bar{X} = \sum X_i \cdot p_i \tag{4}$$

where $\bar{X}$ is the average expected profit in each case under study;
X_i is the expected profit of the ith outcome, $i = 1; 2; \ldots; k$;
p_i is the probability of the ith outcome.

The standard deviation is calculated by the following formula (5):

$$\sigma = \sqrt{\left(\left[\sum ((X_i - \bar{X})) \right]^2 \cdot p_i \right)} \tag{5}$$

where σ is the standard deviation,
X_i is the profit of the its outcome,
$\bar{X}$ is the average expected profit in the situation under study,
p_i is the probability of the ith outcome.

Further, we consider a specific case of the model application.

4. Research results

The insurance company decides whether to outsource the operation of selling comprehensive car insurance to an insurance intermediary or to perform it in-house. Based on the Markov analysis data, the insurer finds the probability of certain scenarios for the case of outsourced and in-house performance of the operation. The data on the possible scenarios, required for executive decision-making are provided in Table 3.

The rounded calculations performed based on Table 3 data and formulas (4) and (5) demonstrate the following:
- the average expected value for outsourcing $\bar{X}1$ is equal to (-28.064);
- the average expected value for in-house sale of a comprehensive car insurance policy $\bar{X}2$ is equal to 19.701;
- the standard deviation for outsourcing $\sigma 1$ is equal to 346.973;
- the standard deviation for in-house sales $\sigma 2$ is equal to 39.705;

Consequently, $\bar{X}1 < \bar{X}2$, $\sigma 1 > \sigma 2$. The coefficient of variation for outsourcing V1 is equal to (-12.36). The coefficient of variation for in-house fulfillment of the operation by the insurer V2 is equal to 2.02. Consequently,

|V1| > |V2|. This is inconsistent with the original proposal (see Formula 1). Using the above optimization model, we calculated the level, to which the element of fraud in car insurance should be reduced in order to make insurance policy outsourcing profitable. An essential condition for this is to ensure that the absolute value of the coefficient of variation for outsourcing (V1) does not exceed the absolute value of the coefficient of variation for in-house accomplishment of the operation by the insurer (V2). The value of V2 is equal to 2.02. |V1| <= 2.02.

Table 3. Source data for executive decision-making on outsourcing comprehensive car insurance policies

Possible scenario	Situation description	Profit (rub.)	Profit structure	Scenario probability (%)	Constituent elements of the scenario probability
			Outsourcing		
Scenario 1	The insurance intermediary sold an insurance policy, the insured event did not happen.	106.912.15	Insurance premium - Insurance premium*Intermediary's remuneration share	27	$p_1 * p_b$
Scenario 2	The insurance broker sold an insurance policy, the insured event happened.	45.630	Insurance premium - Insurance premium*Intermediary's remuneration share - Average insurance benefit	43	$p_1 * p_{(1-b)}$
Scenario 3	The insurance broker realized the risk of opportunist behavior	-1.530.988	Insurance premium - Insurance premium*Intermediary's remuneration share - Insurance benefit in the amount of the cost of the insured property	5	p_2
Scenario 4	The insurance broker failed to sell an insurance policy within the accounting period.	-5.4	Costs for issuing an insurance policy	25	p_3
			In-house sale		
Scenario 1	The insurer sold an insurance policy, the insured event did not happen.	125.779	Insurance premium	9	$p'_1 * p'_b$
Scenario 2	The insurer sold an insurance policy, the insured event happened.	64.498	Insurance premium - Insurance benefit	13	$p'_1 * p'_{(1-b)}$
Scenario 3	The insurer failed to sell an insurance policy within the accounting period.	-5.4	Costs for issuing an insurance policy	78	p'_3

Source: compiled by the author based on Kozminykh (2017).

We expressed the coefficient of variation as the ratio of the standard deviation and the absolute value of the average expected value as follows (2): $\sigma_1 / |\bar{X}_1| <= 39.705 / 19.701$.

Next, we built a proportion and obtained the following inequality: $\sigma_1 * 19.701 – |\bar{X}_1| * 39.705 <= 0$.

Then, we determined the value of $|\bar{X}_1|$ by the following formula (4): $|\bar{X}_1| = |106.912.15 * 0.39 * p_1 + 45.630 * (1-0.39) * p_1 + (-1.530.988) * p_2 + (-5.4) * 0.25 | |\bar{X}_1| = | 69,530.04 * p_1 – 5.4 * p_2 – 1.35 |$.

Then, we determined the value of σ_1 by the following formula (5): $\sigma_1 = ((106.912.15 - \bar{X}_1)^2 * 0.39 * p_1 + (45.630 - \bar{X}_1)^2 * 0.61 * p_1 + (-1.530.988 - \bar{X}_1)^2 * p_2 + (-5.4 - \bar{X}_1)^2 * 0.25)^{0.5}$

The sum of probabilities p1, p2, and p3 is equal to 1. The value of the probability that the insurance intermediary fails to sell the insurance product (p3) is fixed and equals to 25%. Consequently, the probability p2 can be found as follows: $p_2 = 1 - 0.25 – p_1$. $p_2 = 0.75 - p_1$. In this case, we should limit the values of probabilities p1 and p2. As is known, the probability value ranges between 0 and 1. $0 <= p_1 <= 1$. $0 <= p_2 <= 1$.

The general system of equations to be solved in order to find the optimal level of fraudulent benefits in the insurance market has the following form:

- $\sigma 1 * 19.701 - |\bar{X}1| * 39.705 <= 0.$ $|\bar{X}1| = | 69.530.03 * p1 – 5.4 * p2 – 1.35 |$
- $\sigma 1 = ((10.612.2 - \bar{X}1)^2 * 0.39 * p1 + (45.630 - \bar{X}1)^2 * 0.61 * p1 + (-1,530,988 - \bar{X}1)^2 * p2 + (-5.4 - \bar{X}1)^2 * 0.25)^{0.5}.$ $p2 = 0.75 - p1.$ $0 <= p1 <= 1.$ $0 <= p2 <= 1.$

According to calculations in Maple, the optimal value of the probability of successful sale of an insurance product by the insurance intermediary (p1) makes 0.7468210422. Consequently, the probability of opportunist behavior of the insurance broker (p2) is equal to 0.0032, i.e. 0.3%.

Currently, the probability of fraud in selling comprehensive car insurance policies through intermediaries equals to 5%. This value was found through the Markov analysis based on the fact that 10% of paid out comprehensive car insurance benefits are fraudulent (Kozminykh 2017, p. 24-96). Taking into account that the found value of fraud probability is equal to 0.3%, the actual probability should be reduced by 16.6 times. That is, in order to find the tolerated amount for fraudulent payouts of benefits under comprehensive car insurance, we should divide 10% by 16.6. The result is 0.64%.

5. Discussion of the results: proposal of a hypothesis for further research

It should be noted that the coefficient of variation V1 depends not only on the probability of a certain scenario, but also on the size of the expected profit or loss in case of its realization. Consequently, we can propose a hypothesis for further research: Only the outsourcing of inexpensive insurance product sales can be profitable in terms of the ratio of profitability and risk:

1. A reduction in the average expected value X1 will lead to a reduction in the coefficient of variation;
2. In case of selling insurance products, the insurance benefit for which will be significantly lower than the benefits for insuring expensive property, luxury items, or life, the intermediary or policy holder will be less interested in illegal receipt of money from the insurer.

Still the outsourcing itself may give the benefits to the insurance companies but it should take into account the development of nowadays society and the risks and should follow some certain criteri of minimization the risks. Involving the outer experts for the work with the branch net will allow increasing the competencies, getting the various professional experiences, broadening the quantity of typical and original decisions for using them in the branches and creating the instruments for the improvement of the work in the branches of the insurance company. To satisfy all these results the expert team should have the following qualities: the work experience on the Russian insurance market for the last 10 years and to have the experience of working in the TOP-10 insurance companies.

For making the decision on giving some functions to outsourcing, of course, there should be done the economic calculation of the effectiveness of this action. Wherein it is very important correctly and objectively to take into account all the main factors, risks and effects and evaluate the benefits realistically. In this way there is a big sphere for the substitution of the insurance company services functional by the outsourcing in the insurance companies. In such case the investments into the outsourcing company's infrastructure will be made and the demand of the insurance companies for outsourcing services will increase.

Conclusions

To summarize all that has been said above one can come to the conclusion that taking into account the growth of the car insurance selling market the incurance companies in the nowadays competition circumstances should implement new tools of for the companies' profit increasing. One of these tools can be the outsourcing.

The model of the insurer's non-technical risk optimization, proposed in the article and resulting from the intermediary activity in the insurance market, is capable of bridging the gap in the insurance theory and lay a foundation for further economic studies of insurance intermediaries. Application of the model based on comparing the coefficients of variation for outsourcing and in-house accomplishment of certain operations by the insurer ($|V1| <= |V2|$) can be an efficient method for optimizing non-technical risks of the insurer in practice. Testing the proposed model with the panel data of Russian insurers showed that outsourcing in the current Russian market of comprehensive car insurance is unprofitable due to a high concentration of fraud in car insurance.

Based on a case study, we defined that the level of fraudulent payouts in the field of car insurance should be reduced to 0.64% in order to make the outsourcing of sales of comprehensive car insurance policies profitable in terms of the ratio of profit and risk. To reduce the level of fraudulent payouts the insurance companies should practice the legal agreements and contracts with their contractors and use the rational approach about searching and choosing the contractors.

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ANALYSIS OF THE INSTITUTIONAL BUILDING AND SUSTAINABLE DEVELOPMENT OF HIGHER EDUCATION IN TRANSITION ECONOMIES[*]

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Abstract. The scientific discussion regarding the processes of the origin, formation, sustainable development, and institutional change of economic institutions in transition economies took place almost simultaneously with the transition of these economies from the rails of the administrative-command platform to market forms of economic activity. Since then, it has been actively, continuously and quite sharply raised and discussed in a plethora of scientific publications on the problems of theory and practice of social and economic development using the examples of several countries. Despite the background and history of studying these processes that go almost thirty year back, economic science has not developed a common understanding and generally accepted system of interpretation and interpretation of this relevant phenomenon. This paper provides an analysis of the institutional building and sustainable development of higher education in transition economies. We use the examples of former socialist countries to show how the reforms of higher education intended to increase its competitiveness and international prestige, often backfired and led to institutional issues.

Keywords: transition economies; institutions; higher education; regional development; sustainability; universities

1. Introduction

The strategies that universities can use to achieve the improvements in their performance and standings in the international rankings are not always readily apparent, and there is a reactive possibility of responding based on opinions rather than evidence (O'Neill and Palmer, 2004). With regard to the above, it might be informative to see how the educational quality surveys at subjects' level could affect national performance indicators and, in

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particular, organizational issues that affect the interpretation and handling of such information in order to provide meaningful information to curricula and educational improvements. Differences in performance indicators between faculty care, lecturers' training, engineering and business are often discussed, and the impact on management is often apparent and might differ from region to region, or from country to country (Abbott-Chapman, 2011; Fackler and Malmberg, 2016; Hiebert and Stigler, 2017; Girdzijauskaite et al., 2019).

The main objective of sustainable development of higher education is "to integrate the principles, values and practices of sustainable development into all aspects of education and learning" (UNESCO, 2005). As stated in the UNESCO initiative, education should promote behavioral change that can create "a more sustainable future in terms of environmental integrity, economic viability and a just society for present and future generations" (Ibid.).

Furthermore, universities and research institutions worldwide are increasingly addressing the issue of gender inequality and affordability of studies for students from all social backgrounds; nevertheless they are important for innovative regional development (see, e.g., Niño-Amézquita et al., 2017; Schouten, 2019).

However, one has to recognize that efforts to move in this direction are often isolated and difficult to compare and reconcile. Another major challenges universities and research institutions have to face is the inequality in earnings (Jandová, 2012), the rise of the precariat as a social class due to the current trends that include sharing economy, gig economy and technologization of work (Volchik et al., 2018), or the issues related to international migration and migrants in general (see e.g. Ambrosetti et al., 2014; Čajka et al., 2014).

In addition to maintaining the measurement and disclosure of sustainability information, including the academic category of the GRI report (an independent international organization that became a pioneer in sustainability reporting), that allows for the assessment of the actual operating results of activities and their contribution to sustainability. By adopting indicators in the academic dimension, academic managers can compare the development of their respective institutions' sustainable performance and compare their results with other institutions. The inclusion of the academic category in the context of the GRI Sustainability Report also means that the three-dimensional sustainability perspective needs to be broadened across all academic dimensions (Elkington and Lawrence, 2012). The academic category aims to measure and disclose the impact of teaching, research and advisory activities on society. The financial subcategory includes financial aspects directly related to teaching, research and extension activities. The subcategory "Social and Environmental Responsibility" includes issues related to the education of students and their development of social and environmental skills. Institutional accreditation agencies provide resources and tools to assess and improve the quality of education. An institution's assessments by one of the accreditation agencies are based on criteria that include requirements for institutional planning, faculty, students, research, curriculum, etc., and are provided here as a resource. In addition, many of these agencies sponsor regional conferences on evaluation issues and other relevant issues of higher education.

The fact that the education component is more difficult to assess than the training component has led educational institutions and universities worldwide to adapt industrial quality assurance models. The application of industrial quality models in education facilitates the training component in terms of competencies but may affect the training component. Evaluating students by measuring their ability to perform specific tasks actually encourages the training of technicians. Another approach to assessing quality is to ask people whether they have benefited from the college or the university. The College Results Instrument (CRI), developed by the National Center for Postsecondary Improvement Institute (NCPI), pursues a different and intriguing approach. Among other questions, alumni will be presented ten different scenarios five years after graduation. The instrument's design helps potential students make better-informed choices among the various colleges and universities they can apply for.

Moreover, institutional building focused on the reforms of higher education institutions and universities requires mutual influence of multiple factors, including the state, interest groups with different interests, various

stakeholders and policymakers. Adapting the new educational institutions to the new economic system typically takes a long time and efforts, and cannot be achieved overnight.

2. Government policy for managing science and education

Science and technology policy is one of the public policies that promote adequate funding to advance scientific and technological research and education, to examine the impact of science and technology on citizens and, if necessary, to lay down rules (Bozeman, 2000). Since many political issues have a scientific component, most industrialized countries have specialized agencies, ministries or offices dealing with science and technology policies. In addition, some countries (like, for example, in the United States), this compilation contains references to the science and technology policies of other nations and groups of nations.

In many countries, local educational agencies under the central administration have various direct and indirect responsibilities in the education field. In many cases, this involvement is linked to the financing of specific programs related to their agency mandates. For example, the National Science Foundation (NSF) in the United States sponsors numerous research projects at numerous universities, colleges and research institutes across the country (Howard and Laird, 2013).

As public management and public administration are closely interlinked, many universities incorporate public management studies into their master programs in public administration (Ritz et al., 2016). Public administration concepts taught in such programs (eg management of public human resources or public finance management) are often integrated into the public administration curriculum. Upon graduation, trained public administrators may join the ranks of political scientists, public administrators, city administrators and similar professionals who have an impact on public policy in modern societies and institutional reforms that are so needed and required.

Management of science and education through institutional reforms appears to be very important for the socio-economic development of the regions; however it should be done with care and premeditation. In the following section of our paper, we perform an in-depth analysis of these issues and provide some results and policy implications for those who would wish to undertake such reforms.

3. Universities and higher education institutions in transition economies

Transition to market economies in the socialist countries represented a long and institutionally complex process (see, e.g., Kolodko, 1999; Abrhám et al., 2015b; or Jiroudková et al., 2015). Driven by policies and interventions, compensation in the socialist era covered many areas of life, be it income equality or access to public services such as health and education (Hanley and McKeever, 1997). It still remains a problem in most of the transition economies (Abrhám et al., 2015a; Čábelková et al., 2015). The general literacy policy, implemented through the provision of free and compulsory education, has led to a significant increase in educational attainment in the Soviet Union and it satellite states. Equalization also promoted the mobility of educational institutions in the socialist countries, whose effectiveness varied from country to country. Part of the literature affirms the goals of the socialist system to balance human capital and finds high levels of educational and social mobility in the socialist era. Titma and Saar (1995) conclude that in the Soviet Union in the last few years of their existence a real equalization of educational opportunities has been achieved, but that there were regional differences in the availability of secondary schools and universities.

In the first years of transition, public spending on social assistance and public schools declined in most countries. In Kyrgyzstan, children with lower-social status are already disadvantaged in Kyrgyzstan, according to Tiwari and Mitra (2012). The liberalization of the education system in a transitional context can promote the mobility of education in both directions. Losses in income may have forced low-income families to reduce investment in the

education of their children, especially at the tertiary level (World Bank, 2000). Compared with children with better-educated parents, a higher proportion of young people with poorer backgrounds opt for earlier entry into the labor market as the standard of living deteriorates and the economic difficulties are associated with the transition (see e.g. Kalyugina et al., 2015). As a lower level of education is usually associated with a higher level of poverty,the polarization of incomes in transition countries may lead to a growing educational gap across regions and countries.

In the Czech Republic, another former socialist economy, about 12% of the population in the age group 25-64 has higher education (for the European Union countries) this figure was 21% and for OECD countries – about 23%. According to the Czech Ministry for Education, Youth and Sport, there are three types of higher education in the Czech Republic: public, departmental and private. Public and private education is regulated by the Ministry of Education, Youth and Sports of the Czech Republic (Ministerstvo školství, mládeže a telovýchovy České republiky). Departmental universities (the Police Academy of the Czech Republic and the Defense University in Brno) are supervised by the Ministry of Defense and the Czech Ministry of Foreign Affairs. There are 32 private universities, 26 public universities, 2 state universities (Police Academy and Defence University), and about 6-8 foreign (European and non-European) public and private universities (MSMT, 2019).

In 2009, a scandal occurred at the Law Faculty of Plzen University in Pilsen, Czech Republic. It turned out that about 400 people (politicians, officials and police officers) wrote off their diplomas or "managed" to study in a Bachelor or Master program in 2-3 months. After that, the Minister of Education ordered an audit of all universities (paying particular attention to private universities). The audit showed problems: poor quality (especially at private universities), "branches" in the regions, trade in diplomas, plagiarism, "flying" associate professors and professors, etc. Following that, in 2010, the Accreditation Commission of the Ministry of Education announced the policy of "death to private universities": within 2-3 years, the number of private universities had to be reduced to 5-10 pursuing quality, not quantity. Nevertheless, these drastic institutional reforms never materialised, and the balance of universities still remains the same.

Soviet education has always been standing high in the international academic rankings and excelled in the export of educational services. After the collapse of the USSR, Soviet and then Russian universities had to regain our international competitiveness in research, technology and higher education. The goal was to demonstrate significant (advanced) educational achievement that meets the latest trends in education, science and production in Europe and the world. In order to achieve these objectives, reforms of higher educations were introduced. This led to many institutional changes and traps that resulted in adverse effects for the quality of higher education (see, e.g., Volchik and Maslyukova 2019; 2019).

The Russian government is introducing a number of institutional reforms leading to the reforms of higher education in the country aimed at improving its global competitiveness, for example, sending more students abroad to study at elite universities, or requiring all lecturers and professors to publish in internationally recognized journals (e.g. those indexed in databases such as Scopus or Web of Science) (Volchik and Maslyukova, 2018; Volchik, 2018). Russia is also taking steps to revise its own higher education sector due to its poor performance in the global university ranking. Following an independent review of the universities, 15 were selected to receive special grants to improve compliance with the ranking criteria.

Nevertheless, the reforms of higher education in Russia is often accompanied by the mere import of institutions and organizational mechanisms in the context of the socio-economic development. A number of scientific studies are devoted to the problem of import of economic institutions into the Russian economy. For example, Malgin believes that "*developing countries mainly resort to the import of institutions,*" but despite this, *"at the turn of the century, Russia chose this path of building its own institutional environment*" despite a number of imperfections inherent in import, such as:

1. "*independence from the previous development path;*
2. *sharpness and instantaneous transformation;*
3. *possibility of a directed influence on the characteristics of imported institutions;*
4. *social riskiness of import*" (see Malgin, 2007).

However, the process of import was "*carried out without a proper systematic analysis of the benefits and costs of introducing new institutions, as well as in the absence of clear criteria for selecting institutions for import*" which "often led to a decrease in their effectiveness or even rejection" (Malgin, 2007).

4. Merger of universities: interim results from the Rostov region

One can see the grim results of the rapid institutional changes in some real-life examples. A good example might be the merger of universities from the Rostov region in the south of Russia.

Table 1. Dynamics of the number of universities and students in Russia and the Rostov region

	Total universities / number of students (thousand people)		State and municipal universities / number of students (thousand people)		Non-state universities / number of students (thousand people)	
Russian Federation in total						
1980/81	494	3 045,7	494	3 045,7	-	-
1990/91	514	2 824,5	514	2 824,5	-	-
1996/96	762	2 790,7	569	2 655,2	193	135,5
2000/01	965	4 741,4	607	4 270,8	358	470,6
2005/06	1 068	7 064,6	655	5 985,3	413	1 079,3
2010/11	1 115	7 049,8	653	5 848,7	462	1 201,1
2015/16	896	4 766,5	530	4 061,4	366	705,1
2016/17	818	4 399,5	502	3 873,8	316	525,7
2017/18	766	4 245,9	500	3 823,1	266	422,8
Rostov region						
1980/81		107,3		107,3	-	-
1990/91	17	89,6	17	89,6	-	-
1995/96	24	89,7	19	86,9	5	2,8
2000/01	31	150,4	18	139,3	13	11,1
2005/06	31	213,7	19	196,8	12	16,9
2010/11	25	210,0	14	188,6	11	21,4
2015/16	18	149,2	9	139,0	9	10,2
2016/17	14	138,6	8	131,6	6	7,0
2017/18	12	134,5	8	128,6	4	6,0

Source: Rosstat (2018)

During the course of our study of this particular case which started at the beginning of 2017, the number of universities in the Rostov region remained at the same level, but non-state universities decreased, and now there are only four in the region. There is a university with federal status in the region – the Southern Federal University, as well as a basic university of the region, formed on the basis of the Don State Technical University. The total number of students in the region decreased by 10%, which generally corresponds to federal trends, and reached the level of 134.5 thousand people, of which only 6 thousand people - students of private universities (for more details, the dynamics are presented in Table 1).

The number of representatives of the faculty also does not stand still. As of the 2015/16 academic year, a total of 8,991 people worked in the field of higher education, and our survey showed that teachers expect a further reduction in the number of people employed in the industry, and their expectations were met. Already in the academic year 2017/18, the number of faculty members dropped to 7,887. There are no official statistics for 2018/19, but one can say with confidence that this indicator will be even lower, which does not cause much optimism among industry workers regarding their career and its successful development.

As noted earlier, the field of higher education and science is replete with institutional traps, in particular the "dissertation trap" that was previously identified, studied in detail and described in the literature (see Kalimullin, 2005; Balatsky, 2006; or Zhuk, 2011). Over the past time, the situation with this phenomenon has only worsened. By order of the Government of the Russian Federation No. 1792-r dated by 08.23.2019, Southern Federal University was included in the list of organizations that independently award academic degrees of candidates and Doctor of Sciences from September 1, 2018. At the time of preparation of this article, Order of the Ministry of Education and Science of the Russian Federation No. 806/nk On August 23, 2019, all dissertation councils for the award of candidate and doctoral degrees were closed (except for the combined councils created on the basis of several institutions). At the same time, a network of councils designed to work according to the new rules has not yet been created (an exception is one council in one speciality 01.04.15 - physics and technology of nanostructures, atomic and molecular physics (in physical and mathematical sciences). As a result, graduates of the 2019 graduate school the vast majority received a situation in which they lost the opportunity to defend themselves in the old councils and did not get this opportunity in the new ones.

A growing number of applicants for master's studies in areas of training do not correspond to the direction of training in their own bachelor's diploma. There are no official industry statistics on this issue, but according to their own feelings and surveys in the classrooms, graduates increasingly perceive the master's program as an opportunity to get a second education, distorting the essence of master's education as deepening their specialization and getting a higher-level education. As a result, there are people in the audience who do not understand the essence of what is happening in it, they do not really receive a new education, they do not deepen the old one.

The unchanged government policy for managing education and science, based on the methods of "new public sector management" (NPM), leads to an ever-increasing influence of quantitative indicators in assessing the activities of higher education institutions (see, e.g., Tolofari, 2005). More and more publications are required, and it is no longer "desirable" but "required" in various international citation databases, an increasing number of foreign students (as a factor ensuring a higher place in various international ratings), the burden on teachers is increasing due to calculation of rates Teaching staff depending on the contingent of students. In a similar targeting to quantitative parameters, qualitative ones relentlessly move to the background.

Moreover, it becomes evident that quantitative targeting applied to such complex issue and the institutional reforms of higher education, in the end, does not bring the desired result. One of such examples is the so-called "Project to increase the competitiveness of leading Russian universities among the world's leading scientific and educational centers" (known as Project 5-100) which aimed at bringing at least 5 Russian universities among the top 100 universities in the world according to the international ratings. The project was designed for seven years and launched in May 2013, unfortunately has not yet reached its goals and desired results.

5. Institutional building and sustainable modern universities

In general, one would probably agree with us that institutional building for creating a sustainable developing modern university represents a cumbersome and systematic work. This can be shown on many examples and in the debates of educational experts and scientists from many transition economies. For example, one of the

ideological inspirers and initiator of many areas of reforming the sphere of education and science in Russia, the permanent rector of the Higher School of Economics in Moscow, Mr. Kuzminov, published a policy article regarding the format of successful and effective institution-building, in which special attention is paid to the prerequisites for institution-building, which ensure the creation of an effective and sustainable institutional environment (Kuzminov et al., 2005).

In particular, successful institution building requires a long time and special efforts. In other words, it takes a long time for market agents to get used to and successfully implement the institution, as well as to adapt to coordination in accordance with its rules. That is, the annual, or even with a break of two or more years, the introduction of new federal state educational standards leads to chaos. We have not yet managed to understand and adapt the previous ones, as the regulator emits the next ones.

It seems that special efforts are required in order for most market agents to adopt rules of conduct and begin to coordinate in accordance with the newly created institution. It is clear that information support is needed, in other words, clarification to market agents that coordination in accordance with the newly formed institution is really beneficial for them. Indeed, not in reports and words.

The effective implementation of the institute is helped by regular monitoring of changes to which, unfortunately, no one is capable of reaching in the vast majority of cases. Indeed, regular monitoring of the introduced changes in the sphere of higher education would show a decrease in the quality of education, an annual reduction in the number of students and teachers, and an increasing number of publications in "junk" or "predatory" journals for the sake of distorted goals (Volchik, 2018; Volchik and Maslyukova, 2018).

In order to achieve maximum efficiency in the functioning of newly introduced institutions, there might be the need for continuous training of actors, and the idea of laissez-faire reform might be interpreted as a harmful utopia. Some argue that it is not enough to adopt good laws, but it is important to ensure their survival in the new institutional environment. It is essential not to allow negative precedents, the authors write; however, they do not propose such negative examples as an example. Can we consider the reduction in the number of students and teachers a negative precedent or is this a positive trend? Positive precedents allow building trust in new institutions. It is difficult to disagree with this, but what can we consider as positive precedents? And what to do here if the actors do not see anything positive in the ongoing institutional changes?

Overall, it seems necessary to build a balance of power in relation to the new institute; without the support of the new institute by the actors, its development will fail. It is difficult to argue with this statement, but in real life institutional changes are initiated and carried out without the support of the actors of the reforming industry. As Kuzminov et al. (2005) state, necessity might then seek the complementarity of reforms. It would seem like an extremely obvious statement. However, in practice, reforms aimed at improving the quality of scientific research motivate to produce a lot of articles without regard to their quality, reforms of the educational process allow careless students to be registered for years without the possibility of being expelled for failure, and to enrol foreign students without any entrance tests just to increase them for the total number of students.

In general, one needs to take into account the adaptation time of the new institution, which can be a rather lengthy process. Moreover, one would agree that there are no free reforms – everything has its price and reforming higher education with all its institutes can become quite costly. However, lecturers and professors in transition countries who are forced to annually rewrite piles of papers in pursuance of new directives from education managers do not believe that their work is really worth some significant means.

All in all, we think that there should be a project approach to implementing reforms. In other words, reforms should not contradict each other. This aspect we would like to mention in the light of the rejection of the cathedral

structure of our university, and then to its return. Such examples can still be found in fairly large numbers and are indeed very disturbing.

Another issue is the public evaluation of the new institute that has been adapted. It might take some time to sink in; thence its assessment needs to be done after a considerable amount of time. Thence, evaluation of the institutional reforms of higher educational institutions and universities in the transition economies cannot be achieved within a year or two after their implementation. In our opinion, it should be conducted using reasonable methods and after a reasonable amount of time when all the consequences and implications of the institutional reforms are reached and would be easy to measure.

Conclusions

Summing up and summarizing all approaches to the interpretation of institutional changes, one can conclude that anyway, in the modern world, any changes in institutions occur under the mutual influence of all subjects of this process: the state, individuals, special groups with different interests. Furthermore, this process takes quite a long time to root and adapt institutions in the new economic system and implies conscious activity to adjust them and increase the efficiency of functioning. It is this approach that we mean by meaningful, purposeful institutional construction.

This can be very clearly seen in the example of structural and deep institutional reforms of the universities and higher educational institutions in the transition economies. Governments and stakeholders attempted many efforts that were envisaged to improve the quality of education, help to rise in various academic rankings and secure the leading positions in the global educational ratings. However, many of these reforms proved to be controversial and misleading with the similar aspect that can be noticed in almost all transition economies, namely the neglection of the fact that such profound institutional changes require long periods and premeditated approaches and policies.

Overall, we would like to note that if in the realities of domestic institutional construction, the authors of the reforms themselves adhered to their own philosophy, perhaps institutions in the transition economies would demonstrate higher quality and demand from the actors they coordinate.

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THE EFFECTIVENESS MARKETING STRATEGY FOR RIDE-SHARING TRANSPORTATION: INTERSECTING SOCIAL MEDIA, TECHNOLOGY, AND INNOVATION[*]

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Abstract. This paper will discuss the effectiveness of marketing on social media and motivation of users on social media account. Data shows that younger populations are heavily addicted to social media and fragmented in artificial communities on social media. This paper will use Krippendorf's Content Analysis as a tool to analyze two Instagram accounts of the most extensive online transportation provider application in Southeast Asia, Grab. Ethnomethodology also used to analyze qualitative data from Grab users, creating meaning about exposure on Grab marketing on social media. Results of this research show how an intersection (or the common grounds) of social media, technology, and innovation became an effective strategy on marketing for Grab for becoming the leader of online transportation in Southeast Asia.

Keywords: grab; instagram; marketing; transportation; Indonesia; Singapore

1. Introduction

The Internet of Things and penetration of 4G network has changed transportation industry (Atzori, Iera, & Morabito, 2010; Weldon, Viswanathan, & Mullany, 2016; Prodani et al., 2019). Uber revolutionized the transformation of the ownership of cab from a transportation company to the private owner of a taxi so that everyone can efficiently act as transport owner and have their flexible work hour (Chevalier, Chen, Oehlsen, & Rossi, 2018). On March 2018, Uber and Grab agreed on the merger and, consequently, Uber withdraws from the competition in the Southeast Asian market (LOW, 2018). Since then, Grab became the one and the only online shared transportation platform in Malaysia and the Philippines, facing tight competition with their rival, Go-jek in Indonesia, Thailand, Singapore, and Vietnam (Chandra, Bhowmick, Chaabi, & Smith, 2018; Tuan & Mateo-Babiano, 2013).

Data on some previous researches show trends of the majority of ride-sharing application users are younger people with an average age of below 35 years old (Khan, 2014; Lin & Dula, 2016). Other researches show that younger custommers are heavily addicted to social media and fragmented in artificial communities (Susilo & Putranto, 2018). They get more exposure by social media than other conventional media (Purtiwi, 2018; Vogel, Rose, Roberts, & Eckles, 2014).

A significant test for policymakers and the vehicle business is the manner by these new urban portability arrangements. For example, ride-sourcing are represented not just regarding the strategy and activities of the neighborhood specialists. However, in a broader sense, managing forms where issues are distinguished, and intercessions are detailed and executed and expected to accomplish magnificent results and forestall undesirable ones.

Various types of shared portability have been around for quite a while. One of the genuine cases is Demand Responsive Transport (DRT), which gives an on-request transport administration that gets and drops off travelers depends on their needs. One structure type of DRT is regularly known as adaptable miniaturized scale travel (or flexible vehicle), which are by tremendous innovation, empowers and offers adaptable steering or potentially versatile booking of administrations by utilizing minibus vehicles. These sorts of administrations fit in somewhere close to taxi administration and open vehicle transport and expect to give the nearest to a way to entryway-type versatility administration, providing an alternate option in contrast to vehicle use. DRTs are likewise utilized now by vehicle administrators to improve 'social incorporation' in regions where there are holes that are hard to cover. By open vehicle, however, such administrations endure numerous difficulties including operational, institutional, and financial blocks.

Ride-sourcing is a piece of the vaster wonders of the 'sharing economy' which makes individuals reconsider how they profit themselves of administrations from various divisions such as the transport and hotel enterprises. Where new players, for example, Uber and Airbnb, have emerged. In this specific situation, new kinds of on-request shared portability administrations (such as UberPOOL), which use propelled portable advances and Information and Communication Technologies (ICTs) are getting to be prevalent in urban areas such as London, San Francisco, Paris, and Singapore. These advancements have started banters among policymakers, transport organizers, and transport specialists about the job and effect of the new administrations.

Some research stated the benefit of ride-sharing transportation notwithstanding the cultural advantages of decreasing clog, reducing discharges, and saving vitality. Ridesharing additionally offers advantages to the members, including brought down movement (e.g., vehicle possession) cost, access to high inhabitance vehicle carpool lanes, and disposal of the quest for leaving (Furuhata et al., 2013). Be that as it may, because of the absence of appealing business sector instruments, there are challenges of course of action and coordinations and security concerns such as riding with strangers (Li, Krushinsky, Reijers, & Van Woensel, 2014),

Previous research conducted by Wang, Gu, Wang, & Wang (2019) shown with regards to web-based ride-sharing, the buyers' impression of significant worth remains the primary determinant of consumers' readiness to utilize ride-sharing notwithstanding the potential dangers. Utilitarian worth is the predominant segment of purchaser esteem impression of ride-sharing, which shows that the accommodation and financial advantages of a ride-sharing help are fascinating qualities for shoppers. Research from Wang is based on the Chinese market and conducted with three main ride-sharing transportation application in China, namely Uber, DiDi, and BlaBlaCar. In, conclusion they mention about social-behavioral variable but no explanation. This work will fill the gap from the previous reseach.

Some evidence from Indonesia and Vietnam show how intersecting technology and transportation needed growing economic development in both countries (Lin & Dula, 2016; Tuan & Mateo-Babiano, 2013; Vasegar, 2017). Millions of unemployed Indonesians and Vietnamese are shifting into the driver of bike-sharing based transportation, food delivery, and car-sharing based transportation (Brophy, 2018; Fanggidae, Sagala, Ningrum, & Prakarsa, 2016; Tuan & Mateo-Babiano, 2013). Communicating innovation on business model always tends to became positive aspect on marketing effect (Baden-Fuller & Haefliger, 2013; Hauser, Tellis, & Griffin, 2006). Innovation and expansion to became Super-App tends to be an innovative aspect (Siew, 2019; Yuana, Sengers, Boon, & Raven, 2019).

Dominance of Grab on Southeast Asia ride-sharing transportation application(The economist, 2018; Yuana et al., 2019) also has a strong influence on social media. An extensive and massive penetration on social media was conducted by Grab through the enormous marketing campaigns on Twitter, Instagram, and Youtube. Data on 2017 states that Southeast Asians are frequent users on Twitter, Instagram, and Youtube (Hootsuite, 2017). Even when they face another tight competitor such as Indonesia's Go-Jek, Grab still dominates the market, even in Indonesia itself (Yuana, 2019).

Some previous research conducted by Virtanen et al. and Susilo et al. shows that Instagram has a very effective impact on the younger population as a marketing target (Susilo, Prabowo, & Putranto, 2019; Virtanen, Björk, & Sjöström, 2017). Twitter also became an effective communication to initiate intimate relations between company and consumer (Faßmann & Moss, 2016).

This paper will be discussing the reason Grab become a dominant power in Southeast Asia. Even when they face other competitors such as Go-Jek (Indonesia, Thailand, Singapore, Vietnam) and Angkas in the Philippines, Grab still leads the competition on ride-sharing transportation application. This research is limited to comparing Indonesia and Singapore audience as both countries have the headquarters for the ride-sharing transportation application, with Go-Jek in Indonesia and Grab in Singapore. This article will be focusing on what Grab do on their official social media (Instagram) in Indonesia and Singapore, and complement it with what customer feel while using the Grab as part of their daily life transportation application.

2. Methodology
Design of Research
This paper designed to use content analysis by Krippendorf and Ethnomethodology for qualitative data. Measurement of the effectiveness will be based on number of percentage of Instagram's "like" button on every posting (Dougherty, 2005; Susilo, Christantyawati, Prasetyo, & Juraman, 2019). Design of content analysis aims to describe the aspects and characteristics of a message (Neuendorf, Shalski, & Cajigas, 2017). For correspondence and conduct researchers, vital to the estimation of substance investigation is the suspicion that substance examination of content and discourse gives a replicable strategy to get the profound individual or aggregate structures such as values, goals, mentalities, and perceptions.

Qualitative data from ethnomethodology is applied as complementary data from every posting on Grab's social

media account (Susilo, 2017). Researchers observe five subjects as informant and record user's daily activity of accessing Grab's social media and application during the period 1 January – 30 June 2019.

Validity Test
Researchers using two coders to ensure objectivity on coding and data gathering. Researchers use Krippendorf Content Analysis Model to analyze Grab's social media account. Reliability test is utilized to test the data accuracy as well as to determine the level of consistency of data measurement (Mao, 2017; Parker & Holsti, 2006). Reliability test performed by two coders among others. This research also uses Holsti formula to calculate data obtained from those two coders:

$$PAo = 2A/ (N1+N2)$$

where PAo represents a percentage of agreement between two coders, A is the number of three coders' consensus decisions, and N1 and N2 are numbers of decisions coders have made respectively (Lombard, Snyder-duch, & Bracken, 2002). In addition, the validity test from qualitative data was seek the confirmation competence subject (Maxwell, 2015). All subjects acknowledge the data finding and consent to the data publishing.

Design on Ethnomethodology
Garfinkel explains ethnomethodology focusing on how people create meaning on their daily-life (Garfinkel, 2016; Susilo, 2017). Garfinkel saw how subjects create social order on their daily life (Garfinkel, 2012).

During his lifetime until his demise in 2011, Garfinkel has established his status as one of the unique thinkers on Sociology and Behavioral Studies. The distribution in 1967 of Garfinkel's milestone content, Studies in Ethnomethodology, partitioned scholastic supposition. It was met with intense analysis by 'standard' sociologists of the time. Indeed, even now, ethnomethodology holds to some degree as a tricky and irregular situation in its 'home' control of human science, and it is still a long way from standard in the business and the board field. From its beginning, ethnomethodology was never a bound-together field or single hypothesis. Ethnomethodology focusing on how conversational analysis can be analyzed on intersubjectivity (Garfinkel, 2016). It might be valuable to separate the term ethnomethodology into their segmented parts. "Ethno" alludes to a social or social gathering, either big or little. "Ethno" could be a small task group, an association, or an entire institution. "Strategy" alludes to the strategies or methodology that skillful individuals use to approach their public activity. Lastly, "ology" essentially signifies "the investigation of". Put necessarily at that point, ethnomethodology is the investigation of the down-to-earth strategies through which individuals from a specific social gathering achieve social request and association. Take a basic model like a hack. A hack can be just a physiological reaction to expecting to make a sound as if to speak. Yet, it can likewise be a common technique (an 'ethno-strategy') for such as flagging differences, showing suspicion about a record, interfering with somebody, or flagging that somebody is hindering your way. This research designed to analyze social order between users of Grab when they are accessing social media of Grab and take orders on Grab's application. Subject profiling can be referred to in table 1.

Table 1. Profile of Subject

Number	Code of Subject	Nationality	Background (Sex, Age, and Profession)
1	A	Indonesian	Male, 28 years old, Lecturer
2	B	Indonesian	Women, 21 years old, Student
3	C	Indonesian	Male, 22 years old, Student
4	D	Singaporean	Women, 22 years old, Banker
5	E	Singaporean	Women, 23 years old, Executive Assistant
6	F	Singaporean	Male, 24 years old, Student

3. Results

The results of data analysis is the result of the utilisation of Krippendorf Content analysis (Krippendorff, 2003; Marwick & Lewis, 2017; Pacoma, 2019) and data from ethnomethodology are equipped as qualitative data. This research is focusing on two Instagram official accounts of Grab (Indonesia and Singapore). Indonesia (@Grabid) and Singapore (@Grab_sg) have a broad market on Southeast Asia's ride-sharing transportation business. (Brophy, 2018; LOW, 2018; Phillips & Kulkami, 2017; Vasegar, 2017).

Reliability Test

Researcher gathers 76 postings on Grab Indonesia Instagram account (@Grabid) and 69 postings on Grab Singapore Instagram account (@Grab_sg) during the period of 1 January – 30 June 2019. Before conducting data analysis, researcher uses Holsti formula for reliability testing. Coding ouput is presented in table 2 and table 3 below.

Table 2. Coding Output (@Grabid)

Variable	Coding Output		
	Coder A	Coder B	Agreement between two coders
Product Innovation	38	39	38
Engagement	21	19	19
Media Relations	17	18	17
TOTAL	76	76	74

Source: Output of Coding

From the calculation results using the coder's Holsti reliability formula, it shows that the reliability coefficient is 0.97 or 97%, so it has sufficient correlation, and it is acceptable because the reliability number exceeds the minimum tolerable coefficient of 70% or with the calculation above 0.7 (Parker & Holsti, 2006).

Table 3. Coding Output (@Grab_sg)

Variable	Coding Output		
	Coder A	Coder B	Agreement between two coder
Product Innovation	28	31	28
Engagement	22	20	20
Media Relations	19	18	18
TOTAL	69	69	66

Source: Output of Coding

From the calculation results using the coder's Holsti reliability formula, it shows that the reliability coefficient is 0.95 or 95%, so it has sufficient correlation, and it is acceptable because the reliability number exceeds the minimum tolerable coefficient of 70% or with the calculation above 0.7 (Parker & Holsti, 2006).

Finding on Instagram Marketing
Researcher found the innovation variable dominance on both Instagram account of Grab Indonesia and Grab Singapore (@grabid and @grab_sg). In the Figure 1, innovation engagement and media relations variables have quite similar percentage. Engagement and media relations have strong influence from consumer's needs. Consumer seeking information (Sugihartati, 2017) and actively commenting on engagement and media relations' variable. Subject C and Subject D actively like and comment on Grab's Instagram official account. The researcher found Subject C and D actively response their experience using the Grab application and felt the engagement from Grab. Subject C sensed how Grab actively post about consumer satisfaction and easily reach intention on social media. Subject C and D thinks to Grab as part of their life. Subject C and D thinks the most reason they choose Grab than its rival is Grab's innovation. Subject C told she attracted with their innovation of promo fare. She knows this information from Grab's Instagram posting (Figure 1).
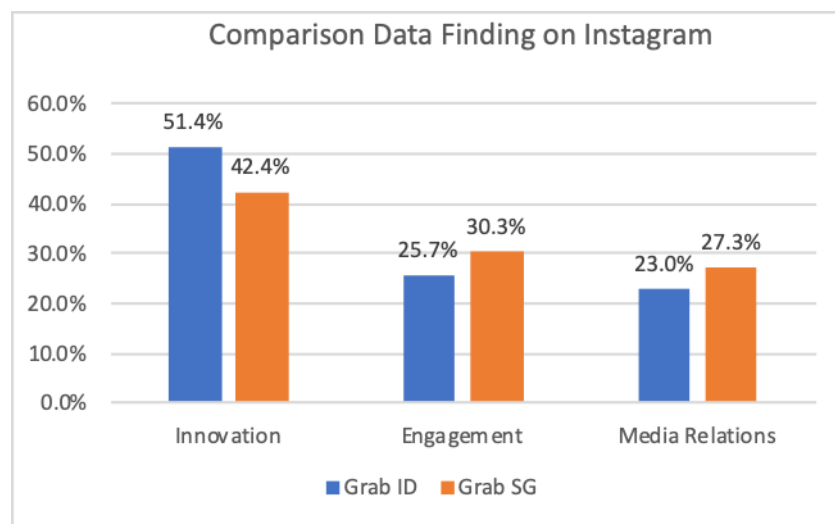
Figure 1. Data Finding on Instagram

Subject D thinks innovation on Grab's subscribers (frequent ride-sharing users of Grab) is suitable for her transportation needs. She knows the subscription program on Grab Official account and told the reason of following Grab official account is to update the latest information from Grab.

4. Discussion

Disruptive era: marketing challenge on digital marketing
Subject A and B use Grab for commuting needs. They told the reason of choosing Grab is their easiness, convenience, and affordability, compared to the public transportation. Subject A and B know Grab from their Instagram ad sense. Subject A and B were trying Grab for the first time after they got exposure from Grab's official Instagram account. Researchers also found both of Subject A and B rarely accessing TV or read newspaper. Subject A and B told that primary sources of their information are by their smartphones. They open the Instagram application almost fifty times daily and more often during the weekend.

This is a challenge for the company when younger people get more exposure to the smartphone rather than conventional media. It is in line with the findings by Susilo and Putranto about shifting of younger people's essential social preferences from conventional to become an artificial or digital community (Susilo & Putranto, 2018). Younger people are more excited to endorsement on social media and get more intention on product details after marketing has digitised (McCormick, 2016).

Subject A and B share their experience of using Grab enthusiastically. Both of them mentions about the promotion posted on Grab's Instagram account as a trigger of their shifting from previous transportation choices to Grab.

Combination on Marketing Strategy: Engagement on Consumer
Another finding on subject E and F shows how they still use Grab rather than its new competitor, Go-Jek. Go-Jek has been massively entered the Singapore market since 2019. Subject E and F felt Grab's GPS dropping point interface is more convenient than Go-Jek's GPS interface. However, subject F often use Go-Jek when it is cheaper. Subject F thinks Grab is in the top of his mind when looking for transport mode to Changi airport because he follows Grab Instagram official account. Subject F forgot to compare Grab's fare with Go-Jek's fare when he is in a rush. Those findings show how Instagram penetration has been massively inserted on top mind's people. Subject F chooses Grab as the first choice because he frequently saw Grab's posting on his Instagram feed. Model of Instagram's marketing penetration can be seen in Figure 2.
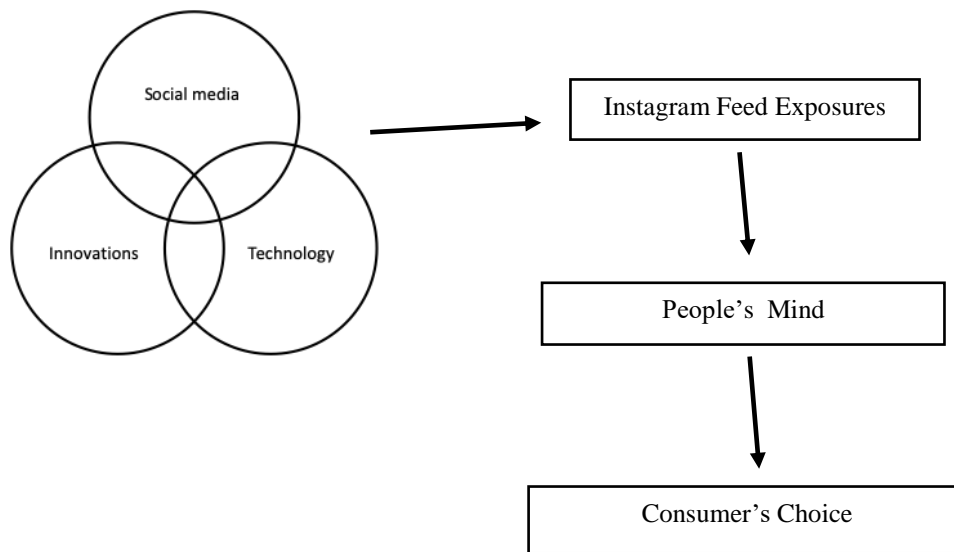
Figure 2. Reconstruction of the Model

This pre-eminence (intersecting of social media, innovations, and technology) makes Grab become the first choice of online sharing transportation than their rival. Subject A, B, C, E, and F acknowledge their dependency on Grab as an application for their daily life. They used various services on Grab and got the information from Instagram about the launch of Grab's certain services. Subject A regularly loads his prepaid cellular mobile phone using Grab. He knows this service from Grab's Instagram posting. He saw the photo on official Grab account post about reloading prepaid number. Innovation to become one-stop services application. Subject A felt convenient and think of Grab as a practical application. Compared with finding from Furuhata et al. (2013), the researcher found the "convenience feeling" became an influential variable to engage the consumer in the era of the Internet of Things. Everyone can become a self transportation entrepreneur using Grab, but trust and convenient feeling from a consumer should be maintained by the application's regulator. Becoming top of mind application when facing tight competition also requires regular customer engagement through social media. In the case of Subject F, even the Grab's competitor offers the cheaper fare, he more trust into Grab service on his Changi airport journey. Subject F who's a millennial who frequently accesses the Instagram feed is more familiar with Grab. Intense

penetration and engagement on social media also impacted positively. Susilo, Prabowo, and Putranto (2019) stated that the sturdy and well-maintained social media is in linear with well-maintained consumer convenience feeling. The consumer became more active on social media and chose what familiar with their social media. If the research conducted by Wang (2019) found economic reason became the most variable of Uber success in China, this research found social media, innovations, and technology are the third variable who intersect each other to boost Grab as leader of ride-sharing transportation in Southeast Asia.

Intersecting of social media, innovations, and technology related with consumer' social need convey an effective marketing impact (Wilson & Consultant, 2005). Grab user got engagement from the triple combination and consumer's retention. The researcher found Grab and Go-Jek competition in Indonesia and Singapore is very tight on people minds. Go-Jek, the Grab's rival use tagline "Product of Nationhood" to implicitly emphasize Grab as a non-Indonesian application. The researcher also found different findings from Awaluddin and Hamid about domestic purchasing intention. The researcher found Subject A, B, and C ignoring Grab status as a non-Indonesian ride-sharing transportation platform (Awaluddin & Hamid, 2019). They prefer to use Grab because when they think about transportation need, they always think Grab on top of their mind.

Conclusions

Intersecting of Social Media, Technology, and Innovations increases engagement of Grab's consumers and show the tendency on Grab as prospective leader market on ride-sharing transportation in Southeast Asia. Consumers are actively seeking information on Instagram feed and make intention on Grab's Instagram account post. During the disruptive era, digital marketing which is intersecting social media, technology, and innovation are massively creating trustworthiness from consumer and penetrating on the top of the user's mind.

This is a challenge for another startup application of ride-sharing application for seeking another innovation of marketing strategy. The dominance of Grab as a super application require extra attention to marketing practitioners to develop an extraordinary application.

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CONSIDERATION OF THE EFFECTIVENESS OF FLAT-RATE COMPENSATION FOR DAMAGE IN INSOLVENCY PROCEEDINGS[*]

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Abstract. Damage to property is a socially undesirable phenomenon that also occurs in insolvency proceedings. The parties involved in such proceedings do not comply with their obligations under the applicable law due to different motives. Such misconduct not only undermines the proper performance of insolvency proceedings, but also threatens or violates the property integrity of another party, especially creditors. This article analyses the importance of flat-rate compensation for damage and the extent of its preventive effect on parties who consider and weigh the effects of their possibly unlawful conduct when they are aware of the amount of monetary compensation for immaterial damage that will have to be provided to the injured party in the event of their breach of an obligation imposed or stipulated by law. Although the Act on Bankruptcy and Restructuring does not regulate flat-rate compensations for damage; we analyse the purpose pursued by legislators, considering the fact that such compensation is laid down in several laws valid and effective on the territory of the Slovak Republic, and we provide supporting arguments favouring the idea to introduce flat-rate compensations for damage also in insolvency proceedings, as this can reduce the rate of offences related to the insolvency of the bankrupt.

Keywords: insolvency, compensation for damage, flat-rate, prevention, persuasive methods of action

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Additional disciplines: Law

1. Brief Review of Legal Liability (in lieu of an introduction)

Responsibility is a considerably wider category than **legal liability.** The former also includes responsibility for disregarding non-legal standards of behaviour which fall under non-legal normative systems in a society. Non-

legal responsibility may include responsibility for violating religious or moral standards. In the following text we will use the term *liability* as legal liability which can be understood in a narrow and broader context.

According to the **narrow context,** liability is equated with a sanction within the three-article structure of the rule of law, while in the **broader context** it implies the obligation of an objectively or subjectively liable legal entity for which the legal conditions of liberation or exculpation are not fulfilled; wherein the legal entity is to incur consequences associated with the conduct forbidden by law. In this text we will continue to use the broader concept of understanding the legal institute of liability.

Liability in this understanding must be exercised in the context of a particular legal relationship. The liability-based relationship arises on the basis of a legal fact - either **unlawful conduct** (a subjective legal fact) or an **unlawful situation** (an objective legal fact). From this point of view, we agree with the definition of legal liability as a special form of relationship in which a new legal obligation - of a sanction nature - arises as a result of a breach of legal obligation (VEČEŘA, M. et al., 2013, p. 249). A breach of a legal obligation may be of a **commissive** or **omissive** nature. We also agree with the assertion that legal liability (all its sub-categories) includes both an element of anticipated adverse legal consequences and an element of enforcement by the state, which is an excellent feature of a legal standard and thus qualitatively separates it from other types, systems of standards. (VEČEŘA, M. et al., 2013, p. 249). Legal liability (accountability) fulfils **reparative**, **satisfactory**, **repressive** functions (which cannot be neglected even in private law sanctions), as well as **preventive** or **other** functions (signalling, comparative etc.) (M. m. VEČEŘA, M. et al., 2013, p. 251).

At the same time, it is necessary to realize that **liability is not only a legal category, but also a moral, ethical, political and social category.** The type of liability that will arise depends on the kind of obligation that has been breached or has not been respected. In particular, the moral consequences of holding a particular person accountable contribute to the fulfilment of the principal purpose and objectives pursued by this act. Moral consequences cause the internal shame of the responsible persons, thereby reinforcing their decision to refrain from unlawful conduct in the future.

2. Liability for damage caused

Liability for damage is one of the types of liability under private law and forms a subcategory of legal liability. Liability for damage is derived as part of a specific offense-based legal relationship between at least two entities; whereby this legal relationship constitutes the right of the injured party to compensation and the obligation of the responsible party to provide such compensation.

The mere occurrence of damage to the property integrity of another person does not automatically constitute a liability-based legal relationship. The first necessary aspect for the creation of such relationship is the commissive or omissive conduct of an entity which is against the law (*contra legem, in fraudem legis* or *contra bonos mores* conduct) and the second aspect is the damage itself. These are two separate aspects, and a liability-based relationship arises provided that these aspects (cause and effect) are linked by a causal relationship (causal nexus).

Damage can generally be defined as harm to a legal entity in its property domain - property integrity. Damage can then be separated into *actual damage* and *lost profits*.

Real damage, in our understanding and in accordance with the court's interpretation, is damage which results in the diminution of the property of the injured party in comparison with the state before the damage causing event, such diminution representing the value in property which is necessary to bring the subject matter back to the previous state. (Judgment of the Supreme Court of the Slovak Republic, file no. 3Cdo 234/2007). As regards its characteristic features, we also emphasize the court's interpretation, according to which the damage equals **harm which 1. occurred in the property domain of the injured party, 2. is objectively expressible in money and 3.**

may be remedied by providing a material benefit, mostly by pecuniary performance. (Judgment of the Supreme Court of the Slovak Republic, file no. 5 Cdo 126/2009).

Lost profits also represents harm to the injured party, but this is because "*the injured party did not experience an increase in their assets as a result of the event causing the harm, although this could have been expected with regard to the regular course of things. Lost profits is not manifested by a diminution in the property of the injured party (loss of assets, as in the case of actual damage), but by the loss of an expected benefit (yield).*"(*Decision of the Supreme Court of the Slovak Republic, file no. 4 M Cdo 23/2008, also the Judgment of the Supreme Court of the SR, file no. 2 Cdo 198/2007 and related case-law*).

A **causal link,** which is an essential prerequisite for damage liability to arise, is an objective condition which cannot be presumed but must be demonstrated by the injured party (who bears both the burden of assertion and the burden of proof) in order to succeed in exercising their right (claim) to compensation for damage. *"Causality itself is inexhaustible. It is always necessary to identify only the cause which the law can take into account when classifying the violation of the law. In order to recognize certain behaviour of a person as being the cause of an emerging fact, such behaviour must be a prerequisite to such fact (conditio sine qua non)."* (OSINA, P., 2013, p. 111).

However, one cannot confuse a causal link only with a temporal link and a connection; in other words, the "**ante hoc, propter hoc" principle does not apply.** (Finding of the Constitutional Court of the Slovak Republic, file no. I. ÚS 177/08-31; § 16). The *ante hoc, propter hoc* principle means "*before this, because of this*", and/or the "*Ante hoc, ergo propter hoc"* variant can be mentioned here which means *"before this, therefore because of this"*. The foregoing describes a logical fallacy inferring the existence of a causal relationship between two separate events due to their temporal succession. (Judgment of the Supreme Court of the Slovak Republic, R 21/1992). The phenomena preceding other phenomena in time may be, but are not necessarily the reason of these phenomena which occur at a later time. The temporal link is only helpful in the assessment of the factual link. (M. m. Judgment of the Constitutional Court of the SR, file no. I. ÚS 177/08-31).

All the above assumptions of the origin of a liability-based relationship (cause, effect, causal nexus) must be fulfilled in a cumulative manner, otherwise the public authority is not liable for damage (due to the absence of facts establishing the liability-based relationship).

The application of the rule of law is linked with the attributes of rationality and fairness of content of legal norms (see Finding of the Constitutional Court of the Slovak Republic, file No. PL. ÚS 15/98) and the above-mentioned attributes form the baseline for values and ideas of the law. Commutative justice demands that illegitimate interference in the property rights of another party be remedied by providing certain performance - compensation for damage. Such compensation should be fair and proportionate in relation to the damage and to the circumstances in which the damage arose, and only by providing appropriate compensation will the imaginary scales of justice achieve equilibrium.

Liability for damage consists primarily of imposing a reparative or restitutive sanction which compensates the injured party for interference in their property integrity, even though public sanctions may be imposed with a primary repressive function (punishment, administrative sanctions, etc.), depending on the severity of the act resulting in the said damage. As a result of this interference with a peaceful condition, the value of the property of the injured party has diminished or has not increased to such an extent as it would have if the responsible person had fulfilled their obligation by law or if they had refrained from certain reprobate actions. If non-material damage is caused, a satisfactory sanction may be imposed together with these sanctions. Although based on the theory of sanctions, reparative, restitutive and satisfactory sanctions are provided for by private law, the

obligation to provide compensation for damage or non-material damage always includes a repressive effect, even though this is not the primary function of such sanctions.

The above discussion, naturally, does not avoid insolvency proceedings in which the collective emergency arrangement of the bankrupt's property rights (his/her adverse property situation) is taking place. Due to their material substance, insolvency proceedings fall under the guarantee provided by Art. 6 par. 1 of the Convention on the *Right to a Fair Trial*, which represents a concept consisting of individual procedural rights and obligations of the parties to proceedings where *civil rights, obligations* or *criminal charges* are decided upon.

The purpose of the given set of procedural rights is to protect *other* rights and freedoms. They do not constitute an objective per se, but a means to achieve the protection of other rights; as a result, Article 6 has instrumental value (Ľalík, T., 2015, p. 1383 et seq., as well as Svák, J., 2011, p. 5).

Thus, justice should represent not only the reparative, restitutive or satisfactory sanction imposed on the responsible party, but it should also represent the procedure that precedes the provision of such performance (i.e. including enforcement proceedings).

In the ideal state of a substantive rule of law, which is also characterized by the existence of a civil society (a conscious, committed and informed society), members of society should not be involved in unlawful conduct at all or to the least extent possible. However, the social reality shows that, notwithstanding the constitutional proclamation of a democratic state governed by the rule of law (Art. 1 (1) of the Constitution of the Slovak Republic), conduct prohibited by law is quite frequent, wherein the entities subject to legal regulation do not fulfil their obligations arising from this regulation and they do so for various reasons.

Although, in reality it is impossible to achieve the ideal state where reprobate actions are not committed at all (or only at the cost of the unacceptable interference in the fundamental human rights and freedoms of members of society), withdrawal from such effort and from attempts to approach as close as possible this ideal and utopian state is not an option.

In their operation (within the scope of their delegated powers and defined responsibilities) public authorities and primarily state authorities must ensure not only the fulfilment of the protective function of the law by punishing unlawful deeds, but in exercising public power they must also adopt effective measures with a preventive and educational impact on society (stimulation role). Preventive and educational impact means that the competent authorities, in exercising public power, seek to achieve a preventive effect on society, with the aim to prevent the occurrence of unlawful deeds *pro futuro* while, at the same time, ensuring the education of the members of society so that they understand the necessity of the behaviour prescribed by law, internalize socially recognized values protected by law and, in general, increase their level of legal socialization to be able to lead the life of law-abiding citizens in the future. However, the educational impact on society is also related to building and preserving the legal culture of a civil society, as it is only a society with a certain level of culture (including legal culture) which can legitimately call itself a civil society. To this end, Prusák aptly states that "*the law of democratic society without legal and political culture cannot do much.*" (Prusák, J., 2001, p. 166).

The achievement in the exercise of public power of these objectives fulfilling the functions of the state and law in society (see more details in Fábry, B., Kasinec, R., Turčan, M., 2017, p. 39), depends on the methods selected to achieve such objectives - which also applies to the methods selected to ensure the proper conduct of insolvency proceedings.

3. On general methods of legal regulation of social relations

A method is defined as a means to get from the starting point to the final point and in reaching this final point the purpose being pursued by a certain meaningful action is achieved. In this context, Knapp sees the method as a sort of orderly procedure. (Knapp, V., 1993, p. 65). This is a theoretical category.

Methods in general consist of persuasive and coercive methods. We agree with Škrobák that *"The intensity and frequency with which persuasion and coercion methods are used are based on a fundamental assumption in which the use of persuasion methods is primary, and the use of coercive methods is secondary..."* (Vrabko, M. et al., 2012, p. 188). The above also results from the principle of graduality as a derivative of the constitutional principle of proportionality.

Škrobák (Vrabko, M. et al., 2012, p. 188) classifies and characterizes these general methods as follows:

- *Persuasion methods* - require demanding systematic action in terms of organization and time; they must act over a long timeframe, while achieving the goal - the desired result - may be uncertain, although if achieved, it is more valued and appreciated. Depending on how the addressee is persuaded, they can be divided into direct persuasion methods and indirect persuasion methods.

- *Coercion methods* - they are also divided into direct coercive methods and indirect coercive methods. When adopting direct coercive methods, deviations are removed in direct contact with the managed entity and the desired state is established immediately. Indirect coercive methods do not immediately address the current state or desired deviation - rather, they consist of follow-up actions so that the methods prevent repeating in future.

The choice of methods to regulate social relations is a purposeful and meaningful human activity, whereby the competent authority (its personal substrate, and, obviously enough the legislator), should choose such methods of acting on social and legal relations as to achieve the pursued goal in the selected area as effectively as possible.

The right choice of legal regulation methods is a prerequisite for achieving the purpose of the law, which subsequently ensures its legitimacy in society. In this context, Melzer aptly states the following: The law is not an end in itself and the existence of a purpose is a prerequisite to legitimate creation of law. Any legal regulation (both general and individual; note) is an interference with freedom and must therefore be justified by a specific purpose which, in addition, must be legitimate. If the regulation did not serve such purpose, it would constitute the inadmissible (arbitrary) will of the legislator under the rule of law. (Melzer, F., 2011, p. 160).

The correct choice of legal regulation methods also affects the extent of damage and how the accountability for damage is derived in connection with insolvency proceedings in progress. With the correct choice of regulatory methods in this area we can achieve fewer offenses causing damage to the parties involved in this proceedings, especially to creditors (*ex-ante* prevention), while, at the same time, this choice may have an impact on the fairness in the process of reparation for the injured parties. It goes without saying that a disproportionately complex procedure for claiming, proving and subsequently providing compensation for damages may discourage injured parties from claiming compensation for damage. Therefore, justice should also represent action preceding such compensation; these actions should enable adequate monetary compensation for immaterial damage, as well as the timely award of compensation.

As we will point out further below, in order for the ideal of justice to be fulfilled, as a fundamental constitutional principle (core constitutional standard) being applied across all legal branches, it would be helpful if the injured

parties in insolvency proceedings could, in certain cases, demand monetary compensation for immaterial damage, **using a flat rate sum (amount).**

4. Flat-rate compensation and their purpose in insolvency proceedings

In claiming compensation for damage, both the burden of assertion and the burden of proof are borne by the injured party and, unless they can bear this burden of proof, they cannot succeed in the proceedings in such case; in other words, the compensation for damage caused by the injuring party cannot be awarded. In general, the injured party may receive compensation for damage in the amount of the actual damage incurred or at a fixed, flat-rate amount (if foreseen by law).

When requesting compensation for the actual amount of damage one must present due evidence of the total costs necessary for restoration to the original state and their appropriateness, otherwise the compensation for damage cannot be awarded as requested. In the case of a flat-rate amount of compensation, the injured party shall only be obliged to prove the illegality of the (un)action of the responsible person resulting in the damage to their property integrity, whereby the conclusion can be drawn from the facts of the objective nature. The actual amount of damage is not relevant in such a case, as it is compensated by a uniform amount. This can be presumed fair in individual cases, especially if the compensation award is governed by the principle of disposition (with the possibility of proving the actual amount of the damage), as otherwise the injured party would not request the flat-rate compensation.

In general, one can accept the opinion that the purpose of the flat-rate compensation is to "*quantify reasonable costs in an abstract way* (or wider costs; note)..." (Suchoža, J. et al, 2016, p. 905). It is true that the flat-rate amount stipulated by law should account for the nature and amount of costs which are reasonably expected to be incurred and proving such expenditure thus appears as superfluous. At the same time, these could be the costs which may only be proven with disproportionate difficulty and thus the injured party is relieved from the administrative burden of exercising their claim. Thus, it is only the flat-rate amount of compensation determined in this way which can be subsequently regarded as fair compensation reflecting the average amount of the harmful effect which can be reasonably expected to arise. If it is disproportionately low, it is to the detriment of the injured party and if it is disproportionately high, it benefits the injured party at the expense of the person obliged to provide it.

In accordance with the principle of legality, the amount of such "lump sum" must be determined legally and, by payment thereof, the liability-based legal relationship between the injured party and the liable party will cease to exist.

The purpose of flat-rate compensations is to achieve the **effectiveness of reparation** for the injured party which also entails a repressive effect on the liable party, since as a result of their unlawful conduct/omission they are to compensate the other party for damage suffered with the repressive effect of forced diminution of the liable person's property by the (flat-rate) amount of compensation for damage. However, the advantage of flat-rate compensation lies not only in an effective reparative function, but it also serves the purpose of prevention and education, whereby the potential perpetrators are motivated to comply, in a proper and timely manner, with their obligations under the relevant legislation (even before imposing a flat-rate reparation sanction). Indeed, if the compensation for damage is determined by a fixed amount which is legally known and the entities which may be affected by the unlawful conduct are known, everyone can realise in advance and calculate the probable economic impact of the breach of obligation stipulated by law or imposed by an individual legal act. Obviously, our considerations are based on the presumption of rationality of the entities involved - in our case, entities involved in insolvency proceedings (creditors, debtors or third parties).

Therefore, if we take into account the fact that the consequences of unlawful conduct are to constitute a threat which should discourage the offender from unlawful conduct in the future, they must signal to the offender the disadvantage of unlawful conduct also in association with the collective arrangement of the bankrupt's property relations. This also applies to the imminent consequences, not just those that were actually inferred. If prevention is to account for the imminent consequences, it is also necessary to take into account the legal awareness and knowledge of the persons concerned as determinants of the effectiveness of legal regulation.

Most entities involved in insolvency proceedings (whether they are creditors, debtors, or persons obliged to provide assistance for the purposes of such proceedings) are legal entities and natural persons conducting business or entities of public law for which (in the case of legal entities these are their personal substrates), the rationality and professionalism of their conduct may be legitimately presumed, along with their higher level of legal awareness and their being informed.

The commercial law principle of professionalism may be highlighted especially in the case of commercial companies and cooperatives. For the purpose of their position, this principle can be interpreted in such a way that "*these entities (entrepreneurs), due to their nature, shall act in an active and professional manner [...]. An entrepreneur is in better position to understand the nature and conditions of a relationship into which they enter* (this also applies to offense-based legal relationships; note by the authors)." (Ovečková, O., Žitňanská, L. et al, 2013, p. 37). **The position of these entities is thus sufficiently specific in order to be able to presume the rationality of their actions and their sufficient knowledge of the applicable law, including the imminent consequences of infringement.** Consequently, these entities are able to adequately assess the (dis)advantages of forbidden behaviour in connection with the insolvency proceedings in progress. In this context, it is also relevant to take into account the instructive duty of the court and the administrator in terms of Act No. 7/2005 Coll. *on Bankruptcy and Restructuring*, (hereinafter referred to as the *"BR Act"*), which helps in informing about the rights and obligations in relation to the insolvency proceedings in progress. Thus, the instructive duty could, *pro futuro* include an instruction on the flat-rate compensation for damage caused in the insolvency proceedings.

Hence, these entities may be reasonably expected to act in line with the theory of rational choice, the creation of flat-rate compensations can therefore be reasonably perceived as an effective persuasive method for such entities and the desired objective may be achieved even in the absence of an element of coercion.

The theory of rational choice, however, does not rely on the complete rationality of subjects as it admits the effects of several internal or external factors. On the other hand, the theory is based on the presumption that before the unlawful conduct an individual weighs the pros and cons associated with such conduct. The behaviour of legal entities can therefore be influenced by the following:

   a) **increase in costs (cons) associated with a criminal offence;**
   b) **increase in benefits (pros) associated with not committing a criminal offense;**
   c) **reducing the benefits of committing the offence;**
   d) **reducing the cons of compliance with applicable law.**

Thus, acceptance of the rational choice theory can also significantly contribute to the suppression of unlawful conduct in the area of insolvency proceedings. Therefore, if the magnitude of the consequences for the breach of legal obligation and their inevitable nature are known, the level of willingness to infringe upon the applicable law is reduced. As the party to insolvency proceedings presumably acts rationally, they are aware that the application of flat-rate compensation for damage maximizes the likelihood of liability (as there is no need to prove actual damage and the administrative procedure for setting the liability is simplified). At the same time, the party is aware of the impact of this liability on their property integrity. The benefits associated with unlawful conduct are reduced and the disadvantages associated with such conduct are increased. Being aware of these facts thus

motivates the perpetrator to fulfil, in a due and timely manner, their legal obligations in connection with insolvency proceedings, thus preventing damage to the property integrity of the parties to insolvency proceedings.

It can be concluded that by choosing the option of flat-rate compensation, entities are encouraged to behave in the desired way because they are aware of the imminent consequences of their unlawful conduct. We will not speculate on the specific amount of flat-rate compensation for damage which would be appropriate for insolvency proceedings. In any case, such compensation should certainly account for the costs of the injured party which can be objectively presumed and the actual amount of such compensation should be high enough to become a relevant variable in the considerations of the parties to the insolvency proceedings, as regards the extent of compliance with the established or imposed orders or prohibitions in such proceedings.

The BR Act lays down the liability for damage caused in connection with insolvency proceedings in several provisions, e.g. in § 11 par. (4) which regulates the creditor's liability for damage incurred in relation to the effects of the opening of insolvency proceedings and where the insolvency proceedings were terminated due to the insolvency certificate; in § 11a par. 1, which regulates the liability of the person responsible for filing bankruptcy on behalf of the debtor regarding the damage caused by a breach of this obligation; in § 32 par. 5 which regulates the liability for damages caused by the denial of a claim which was subsequently confirmed by the court; in § 87 par. 9 which regulates the liability of the administrator for damage caused by the ineffective or unreasonable costs of the administration or realization of assets or the operation of the company. Also, a reference could be made to §109 par. 4 and 5 which regulate the liability for damage caused by recommending or not recommending restructuring, although the conditions for doing so were fulfilled at the time of preparing an expert opinion, or § 167 par. 4 which regulates the liability of the administrator for a damage caused by the illegal distribution of the proceeds.

Thus, the BR Act does not regulate the flat-rate compensation for damage; rather the compensation is based on the actual damage for which sufficient evidence must be presented. Only in the event of liability for failure to file a bankruptcy petition shall it be presumed, unless proven otherwise, that the damage corresponds to the extent to which a creditor's claim has not been settled after the insolvency proceedings was terminated due to the debtor's lack of property, or after the winding up or other enforcement proceedings was terminated due to a lack of property.

Based on the above arguments, it is possible to conclude that flat-rate damages are also beneficial for insolvency proceedings, in particular due to the preventive effect on the parties involved in such proceedings who are aware that their property integrity is likely to be disturbed and, therefore should consider, whether or not they will breach the established obligations in connection with the insolvency proceedings. The flat-rate compensation for damage as such ensures the proper conduct of such proceedings by excluding (minimizing) the occurrence of such acts which would obstruct the proper conduct of the proceedings. However, when considering the adoption of this proposal, it is still necessary to make a choice as to whether each of the creditors (or the entities concerned) would be entitled to receive a flat-rate reparation sanction or whether it would be paid out as a collective reparation sanction which would then form part of the relevant insolvency estate and would be proportionally distributed among the creditors as part of the scheduled proceeds. The first alternative seems fairer.

On the other hand, the appropriateness of flat-rate compensation for damage (increased negative effects of unlawful conduct) must be perceived in a wider context, i.e. as an instrument to minimize public offences, especially insolvency crime and related criminal offences (for the doctrinal aspects of insolvency crime and related criminal offences, see more details in Beleš, A., 2017). As regards Slovak criminal law, it is possible to specifically mention the crime of *obstructing bankruptcy or settlement proceedings* pursuant to § 242 and 243 of Act No. 300/2005 Coll. *Criminal Code*, the aim of which is the interest of the society to achieve the regular and undisturbed course of insolvency proceedings which achieves the goal of the collective satisfaction of creditors

from the existing assets of the debtor - bankrupt. In order to maximize the preventive effect also on the bankrupt (natural person), it would subsequently be appropriate for these claims for damage compensation to become intact claims (§166c of the BR Act), which do not become null and void, not even in the process of debt relief on the part of the bankrupt.

Although the award of flat-rate compensation is not regulated in the BR Act, it is not new in Slovak law. In the following sub-chapter we will describe several laws, valid and effective on the territory of the SR, which regulate these flat-rate compensations, and we will identify the legislative reasons for introducing those laws.

5. Comparative considerations of the flat-rate compensation in the Slovak law

Flat-rate compensations are not new in Slovak law; the awards of flat-rate compensations had been regulated in numerous laws which we will discuss here in terms of authentic and doctrinal interpretation. We will follow the identification of the objective pursued by the specific law (their purposefulness and benefits), while focusing on flat-rate compensation in Act No. 233/1995 Coll. *on Bailiffs and Enforcement (the Enforcement Code)* (hereinafter referred to as "EC") regarding the flat-rate reimbursement of costs related to the enforcement of a receivable under the Act no. 513/1991 Coll. *Commercial Code* and for the flat-rate reimbursement of procedural costs under the Code of Administrative Procedure and Act No. 301/2005 Coll. *the Code of Criminal Procedure* (hereinafter referred to as the "CP").

Flat-rate compensation of costs according to EC

The amendment of the EC by Act No. 2/2017 Coll. *amending and supplementing Act No. 233/1995 Coll. of the National Council of the Slovak Republic on Bailiffs and Enforcement (the Enforcement Code) and on amending and supplementing other acts, as amended, and amending and supplementing certain acts,* introduced <u>a flat-rate reimbursement of expenses incurred by a court bailiff</u> during enforcement proceedings. The introduction of a "flat rate" was prompted by the problems of the enforcement courts existing before the amendment was adopted.

Pursuant to § 197 par. 1 EC (with effect from 1 April 2017) "*In accordance with this Act, the bailiff shall be entitled to a fee **and reimbursement of flat-rate expenses and unavoidable expenses** connected with the proceedings **which are not covered by flat-rate expenses**. The amount of the bailiff's fee in their enforcement of the right to pecuniary performance shall be determined as a percentage of the recovered performance and may not exceed the amount of the recovered claim according to the existing state at the date of issue of the enforcement order.*"

Enforcement courts (before the enforcement agenda was assigned to the District Court of Banská Bystrica) were notoriously overloaded, and, with the increased number of cases they focused more on issuing decisions in the early stages of the enforcement proceedings (specifically enforcement authorisations). Time permitting, decisions on the cessation of enforcement and awarding compensation to the court bailiff was carried out in addition to the above actions. The primary cause behind this was the understaffing of the courts. In some cases, the parties waited for several years for the enforcement to be terminated, with an enormous number of restoration files. Following the termination of the enforcement proceedings or at the time when the decision on termination was issued, it was also necessary to decide on the expenses incurred by the court bailiff, which included an itemised check of the costs incurred, as regards their purpose and assessment whether or not some items (compensation for purchases of file covers, office supplies, etc.) were not already included in the bailiff's fee. Taking into account the overall volume of this agenda (millions of files), it was precisely this activity that thwarted the proper and timely termination of the enforcement.

The flat-rate reimbursement of enforcement costs sought to speed up that procedure. The authentic interpretation of the above amendment reads that "...a flat-rate fee is introduced where the court bailiff shall be entitled to a **known, clearly defined and hence predictable flat-rate fee and flat-rate expenses** _so that the entitled party knows from the very start of the enforcement "how much the enforcement will cost them"_. This will also relieve the courts of the enormous number of cases where it is currently necessary to decide on the expenses of the enforcement. _[...]_ New legislation will help reduce the number of court procedures in enforcement proceedings, concentrate the proceedings and help redraft the defences of the party liable to enforcement." At the same time, we find out that _"the new law on enforcement costs is designed so as to be enforceable without the necessity of court rulings in many cases."_

Therefore, the intention of the flat-rate reimbursement of expenses was to (1) increase the legal certainty of the legal entities affected by the enforcement procedure (entitled party, liable party, court bailiff) regarding the amount of enforcement expenses (their traceability) and (2) speed up enforcement by relieving the courts of the burden of deciding on the amount of the enforcement expenses in the event of the termination thereof (which costs, of course, had to be demonstrated).

Predictability is a determinant of legal certainty (for a doctrinal interpretation of legal certainty from a legal-theoretical and value point of view and its determinants, see Mrva, M., 2013, Mrva, M., Turčan, M., 2016, And Vaculíková, N., 2009) and therefore the injured party should also be able to anticipate the amount of the minimum claim for damage compensation that can be recovered in a simplified administrative procedure (without having to present evidence).

Flat-rate reimbursement of costs associated with the recovery of a claim pursuant to the Commercial Code
Pursuant to § 369c of Act No. 513/1991 Coll., the _Commercial Code,_ in the event of the debtor's delay, the creditor, shall be entitled to receive a **flat-rate reimbursement of costs associated with the recovery of a claim** without the need for delivering a separate notification to the debtor. This provision is further specified in an implementing regulation - Decree No. 21/2013 Coll. of the Government of the Slovak Republic _implementing certain provisions of the Commercial Code._ The amount of the flat-rate compensation for the costs relating to the recovery of a claim is established in § 2 at a **one-off payment of EUR 40**, irrespective of the length of the delay. This shall not apply in cases where the obligation arises from a consumer contract and the debtor is the consumer. This reimbursement was incorporated into the Commercial Code by Act No. 9/2013 Coll. _amending Act No. 513/1991 Coll., the Commercial Code, as amended, and amending and supplementing certain acts_ (effective from 1 February 2013). This amendment transposed Directive 2011/7/EU of the European Parliament and of the Council of 16 February 2011 on _combating late payments in commercial transactions_, which states in point 21 of the Preamble that the Directive "_should be without prejudice to the right of Member States to provide for fixed sums for compensation of recovery costs which are higher and therefore more favourable to the creditor, or to increase those sums, inter alia, in order to keep pace with inflation._"

The authentic interpretation (explanatory memorandum) reads that the flat rate compensation of costs associated with the claim recovery _"represents compensation of the **administrative internal monitoring costs** incurred when checking compliance with contractual obligations."_

"This is the reimbursement of administrative internal monitoring costs incurred when checking compliance with contractual obligations (costs of keeping records of debts, **costs related to the delivery of reminders to the debtor by phone or in writing,** although this is not a condition for entitlement to flat rate reimbursement of costs)" (i.a. Judgment of the District Court in Vranov nad Topľou, File No 8 Cb 44/2015). In combating delayed payments, stricter sanctions are imposed for delays in fulfilling an obligation, using the institute of flat rate compensation for the costs of claim recovery. This claim arises from the very fact that the debtor is in delay **without the need to**

prove the real costs associated with the claim recovery. In the context of general methods for the regulation of social relations, this institute can be seen as a persuasive method of action, when, through the imminent interference with the property integrity, the party to the business obligation relationship shall be motivated to fulfil, in a timely manner, their obligations arising from this relationship; it also has a compensatory role.

The flat rate reimbursement of these administrative costs seeks to simplify the reimbursement of those costs which can be reasonably and legitimately assumed to exist in connection with the creditor's delay, and, therefore, presenting relevant evidence would be objectively redundant.

As regards the purposefulness of the above, legal doctrine arrived at the same conclusion: *"The flat rate reimbursement of costs should reimburse the costs incurred by the creditor due to the debtor's delay (the salary of the administrative employee processing the reminder, postage costs for the delivery of the reminder, etc.). By establishing administrative costs (...), there is no need to separately prove the costs actually incurred and, given the internal nature of these costs, **this would often not be possible.** On the contrary, external costs (involvement of an external lawyer, court fees) are relatively well demonstrable and therefore the compensation of such costs goes beyond the scope the flat rate reimbursement.*" (SUCHOŽA, J. et. Al., 2016, p. 905).

Since this is the transposition of a directive (secondary law) of the European Union, it can be established that the question of the purpose and effectiveness of flat rate compensation in the appropriate amount is also accepted in certain cases at the international level. In addition to eliminating the administrative burden in favour of the creditors, the general preventive effect of the present law can be perceived as one which aims at minimizing debtors' delays using persuasion with a focus on the economic impact of a potential delay in fulfilling the obligation.

Flat rate compensation of costs in infringement proceedings and criminal proceedings
During infringement proceedings, the flat rate costs of the proceedings are due by the offender and, if applicable, by the petitioner, if the proceedings initiated on the basis of the petition were terminated pursuant to § 76 par. 1 a), b), c) or j) of the Act on Offenses. (The offence in question did not materialize or is not classified as an offence; the person charged with the offence did not commit the offence; the offence in question was not proved to them or the petitioner withdrew their proposal to initiate the proceedings or failed to show up at the hearing without due excuse or reason, even if summoned in due time.) The obligation to pay the costs of the proceedings does not apply to the ticket or order proceedings.

In these cases, the costs of the proceedings are to be reimbursed by a flat rate amount in accordance with Decree No. 411/2006 Coll. of the Ministry of the Interior of the Slovak Republic *establishing the flat rate costs of infringement proceedings,* namely EUR 16 (general amount of compensation) or EUR 33 (when an expert in fields other than psychiatry is recruited) and EUR 49 (when a psychiatric expert is recruited). The question of the appropriate amount of such compensation can be considered, as their amount was fixed on 1 July 2006 and the implementing regulation has not been amended since then. The real cost has undoubtedly increased over the period of 13 years, at least by the statistical rate of inflation.
In criminal law, we can highlight § 555 par. 1 and § 556 par. 1 CP. If the defendant is found guilty, in addition to the costs of imprisonment, imprisonment and the fee and compensation to the appointed lawyer and to the appointed representative of the lawyers (except in the case of free defence or defence at a reduced compensation rate), he or she is obliged to reimburse, other costs borne by the State - at a flat rate.

The amount of this flat rate compensation is determined by Decree No. 93/2012 Coll. of the Ministry of Justice of the Slovak Republic *establishing the flat rate amount of costs in criminal proceedings and the amount and method of reimbursement of increased costs in criminal proceedings.* The amount of the flat rate compensation depends on the course of the criminal proceedings and on whether or not an expert opinion was presented - if the

offender was found guilty, the flat rate amount is set at EUR 60 on the basis of a criminal order, EUR 80 in the case of a plea bargain and in the case of a judgment issued after the main trial, the amount of compensation is set at EUR 120. These amounts are increased by EUR 150 with the addition of one expert and by EUR 200 with the addition of more experts.

Pursuant to § 556 par. 1 of the CP, the flat rate compensation of the costs in state proceedings shall be applied in the event of a totally unsuccessful appeal or a retrial; the amount thereof is set at EUR 200. The legal doctrine states that *"The law prevents the unjustified submission of proposals for extraordinary remedies by imposing the obligation to reimburse the costs incurred in connection with the hearing of a manifestly unfounded application [...] this shall apply to any party who has applied for extraordinary remedy... "* (ČENTÉŠ, J et al., 2015, p. 943). Considerations of the ineffective assessment of some costs are also applicable to criminal proceedings.

Conclusion

In their reasoning, the authors concluded that a flat-rate compensation for damage caused in association with insolvency proceedings would be an effective tool in minimizing unlawful acts resulting in damage to the property integrity of the parties to the insolvency proceedings. The knowledge of a predictable sanction (in our case these are sanctions of a reparative nature) leads to the awareness of the negative effects associated with certain unlawful conduct and, as a consequence, rationally the more appropriate option for such a party is to comply with the orders or prohibitions laid down by the applicable legislation. To this end, a relevant variable is also the irreversibility of a sanction achieved by, inter alia, elimination of the administrative burden of the process preceding the imposition of such sanction. The rationality of parties to the insolvency proceedings can be legitimately presumed (also on the basis of the principle of professionalism in commercial companies) and therefore it seems appropriate to rely on the conclusions of the theory of rational choice for the purposes of achieving an effective preventive impact on the social relations associated with the insolvency of the bankrupt. Flat-rate compensation for damage would facilitate the reparation of the injured parties, although it should be ensured that the compensation is established at an appropriate level. These considerations were examined in the context of the purpose of flat-rate compensations in specific legislation linked to the BR Act. Also, in the context of the presented reasoning, we have arrived at the conclusion that the flat-rate compensation for damages was beneficial in justified cases. Insolvency proceedings represent an emergency collective arrangement of the bankrupt's property and, therefore, it is essential to prevent any behaviour which could jeopardize (obstruct) its proper progress. Flat-rate reparation sanctions would motivate all stakeholders to fulfil their statutory or individual legal obligations in a due and timely manner, while at the same time, the sanctions (in conjunction with the instructive duty of the court and administrator) would manifest the adverse economic impact of the failure to fulfil obligations associated with the insolvency proceedings in progress. However, the conclusions deserve closer attention to empirical research.

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CALCULATION METHODS FOR COST MANAGEMENT IN THE CONSTRUCTION INDUSTRY

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Abstract. Information on costs in the system of information on the activities of construction organizations plays a significant role in making managerial decisions, since the main indicators characterizing the activities of the organization are the volume of costs and the cost of production calculated on the basis of data on costs. The relevance of this article lies in the fact that the technology of construction production has a number of specific features that affect the organization of analytical and synthetic accounting of business entities. High competition, the search for reserves to reduce the cost of construction products and increase profitability require information on the real level of costs, rationality of use various resources. In the management system of a construction enterprise, an important place should be given to management of construction costs.The article also considers analytical tools and recommends a combined system for calculating the cost of construction products in the organization of management accounting, ensuring the adoption of effective management decisions of the construction company. When writing the article, general scientific methods of cognition (statistical, normative analysis, synthesis, analogy, generalization), empirical-theoretical (collecting, studying and comparing data), as well as methods of scientific cognition (historical and legal, systemic) were used. When processing and systematizing data, grouping and classification methods were used. The information-statistical base of the study was made up of data from official periodicals and information-analytical publications of the Republic of Kazakhstan.

Keywords: cost; costing; cost management; construction industry; management accounting; cost accounting method

JEL Classifications: M41, M40

1. Introduction

Features of cost accounting and calculation in construction organizations is a separate branch of the economy, characterized by certain relationships between its subjects. At the same time, questions of the economic content of production costs are important, since economists often put different contents in the same concept of costs, which leads to a misinterpretation of economic processes.

In domestic scientific publications there are many classifications of the method of accounting for production costs and calculating the cost of production.

Analyzing the studies conducted in this area, we can conclude that one group of researchers considers methods of cost accounting and costing, which supplies only the information created at the stages of accounting for production costs. However, we adhere to this point of view, since the component of management accounting is production accounting, which is understood as accounting for production costs, calculation and cost analysis (Prokop & Karbowski, 2018; Hilkevics, Semakina, 2019). Based on information on production costs, management decisions are made.

The main task of accounting for the cost of construction works is the reflection of costs: timely, reliable and as complete as possible. These costs are associated with the production of construction work, the delivery of construction work to the customer, the determination of possible deviations from accepted standards and planned costs, proper control over the use of production resources (Saperova 2018).

Analyzing the studies conducted in this field, we can conclude that one group of researchers considers methods of cost accounting and costing, which provides only information created at the stages of accounting for production costs.

2. Methodology

The development of market mechanisms highlights the need to measure production costs and profits, their balance relative to each other, which is the basis for sustainable development of the enterprise. In these conditions, to develop effective management decisions, it is necessary to create a cost management system that ensures a constant focus on the final results of production.

Construction has its own characteristics, which leave their mark on the organization of management accounting, including costing and budgeting (Sasongko et al. 2019; Popesko et al., 2017). A feature of construction work is the duration of the production cycle. As a rule, the execution of contractual agreements takes more than one month. The time and cost of material resources for the construction of a residential building or household facility cannot be compared with the production of food and non-food products. During this time, prices may change, the economic situation in the country, which means that it is necessary to achieve constant cost reduction in construction by improving equipment, technology and construction management. Therefore, the most important task of cost accounting and calculation in this industry is to minimize the cost of construction production.

As Shevchenko T.N. notes in his publications on cost accounting and costing in various industries, construction has its own characteristics:
1. In construction, there is always work in progress, which complicates cost control.
2. Construction objects cannot be transported, that is, a strict accounting of supply and demand is necessary.
3. The depreciation period is longer than that of machinery and equipment, it is necessary to carry out

reconstruction and modernization, which saves time and money in comparison with new construction, and all this must be taken into account when establishing depreciation rates.

4. The assessment of the construction site is very complex and requires:

- firstly, the calculation of numerous qualitative indicators;

- secondly, highly professional specialists, etc. (Shevchenko 2016).

Thus, the goals and objectives of calculation and budgeting in construction are different from the goals and objectives in industry. For proper cost accounting in construction, it is necessary to keep records separately for each contract. To calculate the costs corresponding to the income received during the reporting period, you must have information about the actual costs, the reimbursement of which is provided for by the contract.

Analytical accounting of the costs of the main production is carried out for each type of work in the statement of type of cost, where the actual cost of each completed and commissioned object (type of work) is generated. In analytical accounting, a separate analytical account is opened for each calculation object of construction and installation works.

In the management accounting system, the procedure for generating cost is not so regulated. This cost is not formed for tax purposes, but to ensure that the manager has a complete picture of the costs (Paiva & Carvalho, 2018). Therefore, in the system of this accounting, various methods for calculating the cost can be used (depending on which managerial task is being solved).

According to IFRS 11 "Accounting for construction contracts", the costs arising in the course of the implementation of the construction contract can be grouped into three main elements (International Financial Reporting Standard (IAS) 11 "Construction Contracts").

The calculation method of accounting for production costs, used in domestic accounting practice, involves the formation of overhead costs separately, by industry or even by the enterprise as a whole, and is subject to write-off at the end of the reporting period by ownership with their simultaneous distribution between calculation objects, in the context of which an analytical accounting in proportion to the distribution base adopted in the industry. Most often, overhead costs are distributed in proportion to the direct costs or salaries of the main production personnel, after which the process of calculating the total cost of production is carried out (Avrova 2006; Novak et al., 2017).
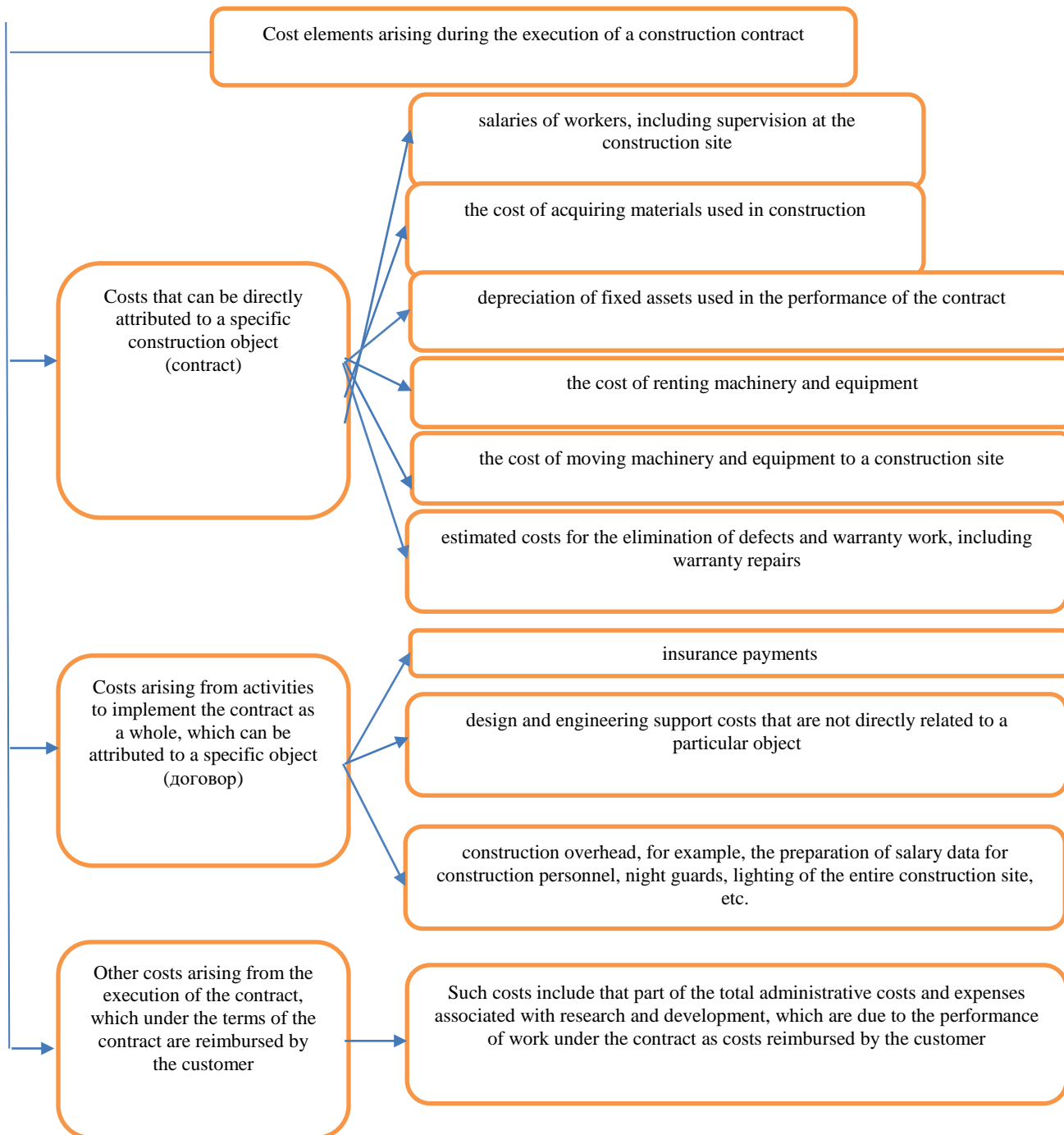
Figure 1. Grouping of costs arising during the implementation of a construction contract.
Source: compiled according to the source IFRS 11 "Accounting for construction contracts"

Overhead costs with the same characteristics are distributed between the objects in a calculated way based on the normal (optimal, normative) level of construction activity. Overhead costs of construction may also include borrowing costs if the contractor uses an alternative accounting method in accordance with IAS 23 "Borrowing Costs".

Grouping by cost element is the basis of the estimated cost of production - a planning document that reflects all the costs of the enterprise due to the release of a certain volume of industrial products for both its own divisions and third-party customers.

Recognition of costs under construction contracts is carried out by the following entries:

Dt1340 - "Construction in progress";
CT - accrued wages to workers:
- accumulated depreciation of fixed assets used during construction;
- the cost of renting machinery and equipment;
- the costs of design and engineering support in the implementation of work on a specific object, etc.
The distribution (allocation) of costs is necessary in order to obtain data intended for:
- calculation of the cost of the product;
- assessment of the quality of management and control;
- making informed and timely management decisions.

The procedure for the distribution of overhead costs by accounting objects (contracts; projects; construction objects, types of work, etc.) is determined by the business entity itself and reflected in the accounting policy.

Overhead costs can be allocated to accounting objects:
- in proportion to direct costs;
- in proportion to the contractual (estimated) cost of construction and installation works;
- in proportion to the cost of paying workers in the main production;
- in proportion to the number of spent machine shifts (for the costs of operating construction equipment and in structural units of mechanization);
- other methods.
To determine the cost of construction at various stages of the investment process, one should use a system of norms of overhead costs, which according to their functional purpose and scale of application are divided into the following types:
-aggregated standards for the main types of construction;
- standards for the types of construction work;
- individual standards for a specific construction organization;
- marginal norms of overhead costs for construction work, designed to determine the cost of work at a basic price level.

Information base for control and analysis are:
- business plan of a construction organization - statistical reporting;
- work schedules;
- acts and certificates of admission of complexes (stages) and volumes of work;
- report on the costs of production and sales of products f-5-z;
- report on the costs of basic building materials;
- data of synthetic and analytical accounting (Nazarova 2009).

As in industry, the most important task of management accounting in construction is cost control. Modern construction organizations in their activities apply different methods of calculating costs, using traditional means and new developments. Nevertheless, many operating enterprises continue to fully use the traditional methods of calculation (Davison 2015).

Methods of calculating costs used by construction organizations are presented in Figure 2.
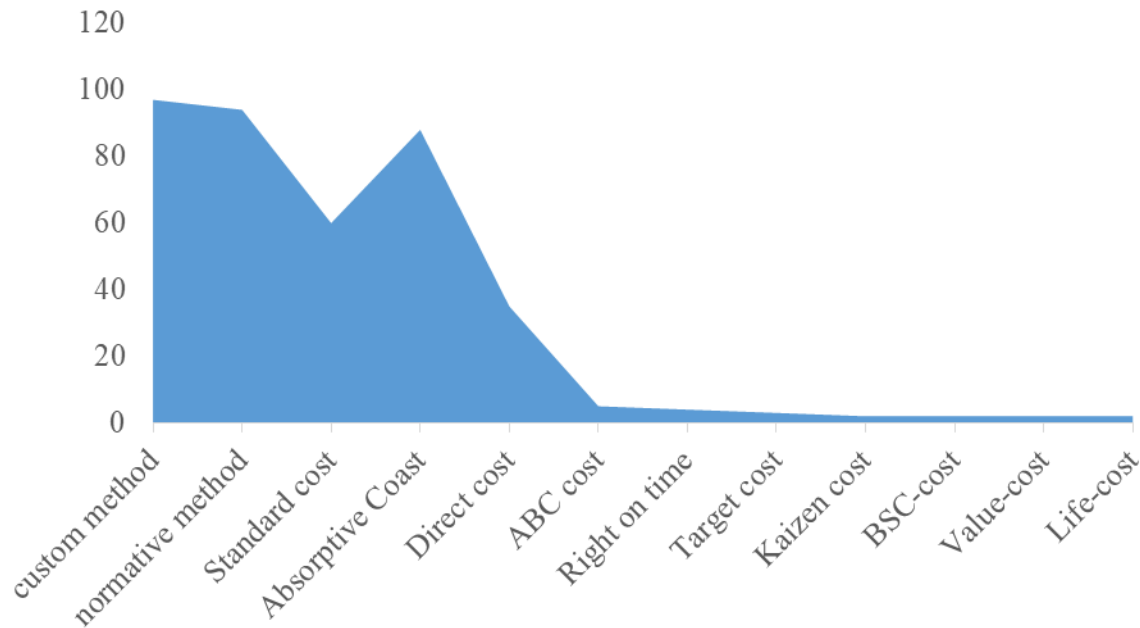
Figure 2. Methods of calculating costs used by construction organizations.
Source: compiled according to the source Davison (2015)

According to Figure 2, when performing work, some large companies successfully use the entire list of tools listed, however, not all companies can afford to use such tools, which indicates the complexity of the work and in the large volumes of tasks solved by the management accounting system.

In his research, Davison J. confirms and proves that in order to choose one or another calculation method, the company management must present the specifics of each of them and the result that can be obtained by their application, and which will affect the financial result of the entire company (Davison 2015).

A.Sh. Margulis in his work "Costing in industry" also considers the cost accounting method and the costing method as a single process of studying the costs of certain types of enterprises for the production and sale of products from the standpoint of measuring, controlling, determining the cost of products and works; he notes that "the artificial separation of calculation methods from cost accounting methods leads to the technicalization of processes for calculating the cost of production and does not follow from the economic nature of cost accounting methods" (Margulis 1980).

Thus, based on the analysis of the study of the methods of calculating costs used by construction organizations, it

is advisable to distinguish the classification of methods of cost accounting and costing the cost of production of construction organizations (Zimakova & Tsyguleva & Serebrennikova 2014; Pustylnick et al., 2017).

Classification of methods for cost accounting and costing of production costs of construction organizations is presented in Figure 3.
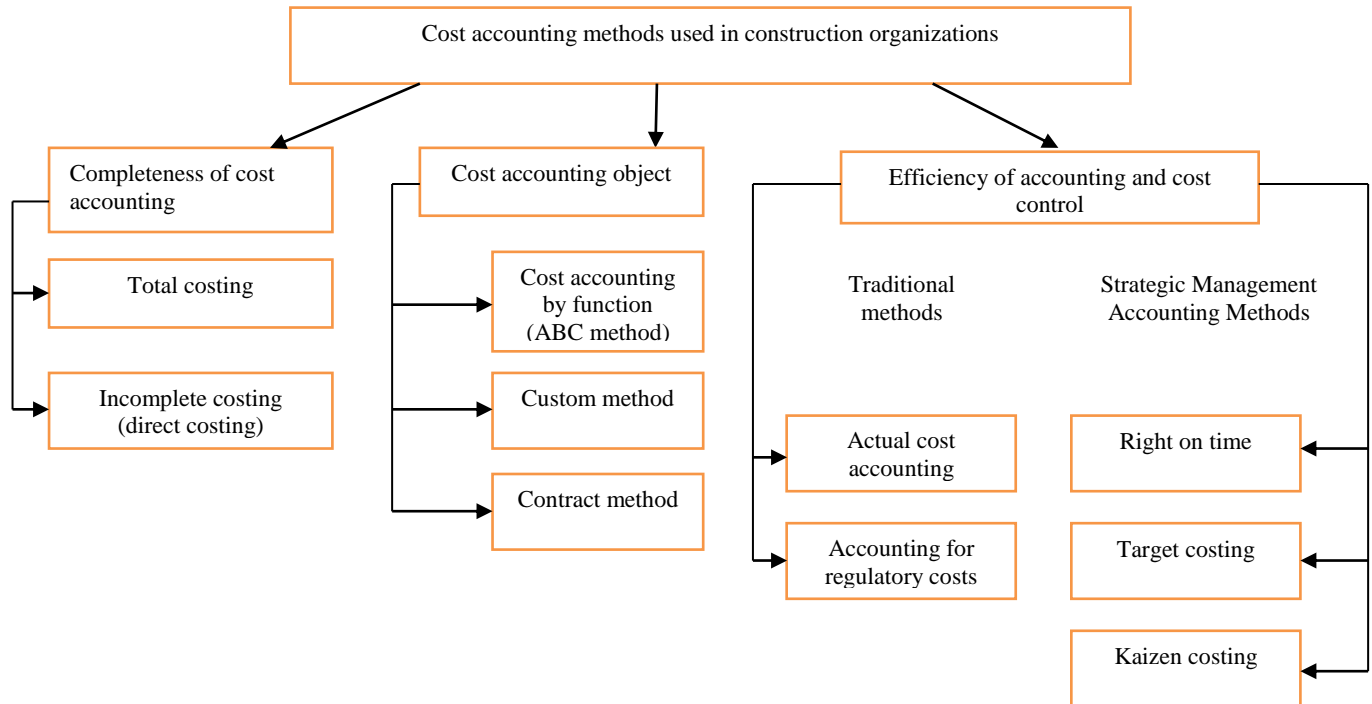
Figure 3. Classification of methods for cost accounting and costing of production costs of construction organizations.
Source: compiled according Gerasimova, Silka (2019)

In the process of analyzing and studying the different opinions of academic accountants, economists and financiers, we came to the conclusion that the process of organizing accounting, managerial accounting and cost management allows us to identify approaches to classification:
- management accounting methods (traditional methods of cost accounting);
- cost control methods (budgeting, cost accounting for deviations);
- methods of strategic management accounting (which are used before the start of construction activities) (Rajnoha et al., 2016; Vveinhardt & Andriukaitiene, 2017).
Based on this classification of cost accounting methods that are used in construction organizations and stages of construction, it is necessary to correctly allocate costs in relation to the created product, as well as in the context of each of the activities and divisions. In addition, the level of expenses should be controlled, since the result of the work will depend on this.

According to L.N. Gerasimova and D.N. Silka needs to use the model of toolkit formation for cost management taking into account the life cycle of construction products and construction stages, which will make it possible to effectively manage all economic indicators during the adoption of diverse managerial decisions (Gerasimova & Silka 2019).

A questionnaire survey of construction companies conducted in the USA back in 2017 showed that more than 30% of the 394 companies participating in the study use two or more calculation methods. Of the companies surveyed, 36.7% use full costing (Gerasimova & Silka 2019).
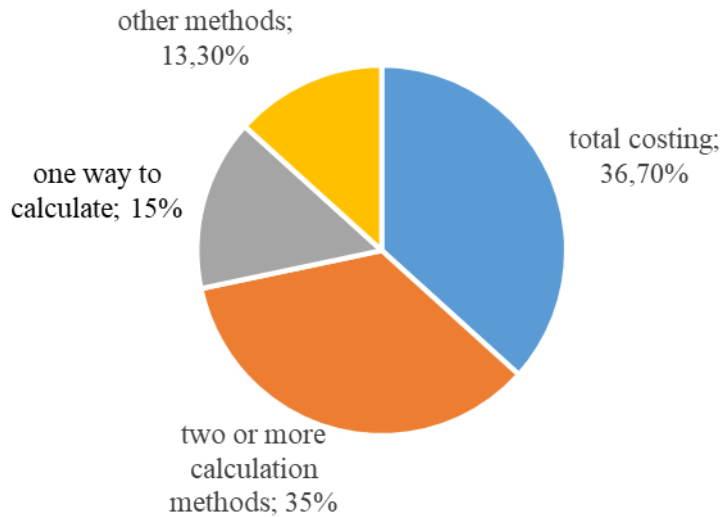
Figure 4. Calculation methods among the companies surveyed, %.
Source: compiled according to the source Druri

In the scientific literature on the accounting of costs in construction, two classical methods are distinguished: the custom-made method of accumulating costs over a certain period of time by type of work and cost center (Budasova & Yegorova). In this case, various methods of calculating the cost of work performed and evaluating construction in progress (Druri 2017).

Some economists use unconventional approaches to classifying cost accounting methods that can be adapted to the construction industry. So, in the work of I. Kuleshov methods of cost accounting are classified depending on the stage of the circuit of the nominal and real property of the enterprise (Kuleshova 2013). O.V. Kaurova and O.S. Yumanov noted the need to take into account the practice of cost accounting and distinguish methods such as custom, alternate, process, part-price, part-time, depersonalized ("boiler"), normative (Kaurova 2013).

Tkachenko I. in his scientific articles notes that the most common method of accounting for costs of construction works is the custom method, when the accounting object is a separate order opened for each construction object (type of work) in accordance with the contract concluded with the customer for the performance of works, according to which cost accounting is kept on an accrual basis until the completion of work on the order. In this case, the cost of the order is determined by the sum of all production costs from the date of its opening to the day of completion and closing. Reporting costing with a custom accounting method is made after the work on the order is fully completed, which is a significant drawback of this method (Tkachenko).

Fovanov V. claims that the specifics of the management and organization of accounting for construction products, construction is determined by the characteristics of the construction industry. The costs of the contractor in the performance of contract construction work relate to the costs of ordinary activities and are the sum of all actually incurred costs associated with the production of contract construction work performed them according to the

construction contract, namely: from the cost of the materials used in the construction process 'an and labor, the depreciation of fixed assets and amortization expenses, as well as other types of costs (Fovanov 2008).

The costs of contracting construction work are recognized in the accounting records subject to the following conditions:
- the expense is made in accordance with a specific contract, the requirements of legislative and regulatory acts, and business customs;
- the amount of consumption can be determined;
- there is confidence that as a result of a particular operation there will be a decrease in the economic benefits of the organization (Kalinowski, 2017).

When forming the cost of construction products, there is an assumption of temporary certainty of the facts of economic activity, that is, the cost of construction work is included in the cost of the work of the calendar period to which they relate, regardless of the time of their occurrence and regardless of the time of payment - preliminary or subsequent (Semyonova & Adzhieva 2017).

In order to increase the significance of the information generated in the accounting of construction organizations for making effective management decisions, it seems to us that it would be appropriate to use a combined system for calculating the cost of construction products using the ABC method (Activity Based Costing). In this case, ABC-calculation should be considered as an additional method in relation to the traditional custom-made calculation method in construction.

I would also like to note the fact that for each stage and each stage of construction activity, we can distinguish characteristic methods and models of managerial accounting, and the combination and application of certain methods can lead to the creation of a mechanism for consistent, targeted management of the costs of building an object (Adamov & Chernyshev 2016, see Table 1).

Table 1. The effectiveness of the application of cost management tools during the construction phase

	Kaizen costing	Standard Costing / Regulatory Accounting	The method of forming the full cost	Direct costing	Custom method	Cost accounting at the place of their occurrence
Customer	-	-	-	-	-	-
General contractor	+	-	+	+	+	+
Subcontractor	-	+	+	+	+	+
Mixed type of contract	+	+	+	+	+	+

Source: compiled by authors using the sourse Adamov & Chernyshev 2016

There are a sufficient number of methods by which you can calculate the cost of production. To choose one or another calculation method, the company management should be well aware of the specifics of each of them and the result that can be obtained by applying them, and which will affect the financial result of the entire company (http://www.novapdf.com).

Enterprises, using one or another calculation method in construction with cost accounting, are looking for ways to reduce production costs (Table 2).

Table 2. Cost reduction measures

№	Factors	Actions
1	Factors independent of the activities of the construction organization	Changing the structure of work in the planning period
		Introduction of new tariff networks and rates
		Change in selling prices for materials and components
		Change in freight rates
		Change in estimated standards in the documentation (installation, equipment)
2	Intrinsic factors	Resource Consumption
		Decrease in shift losses (working hours, downtime)
		Choosing the best suppliers
		Cost reduction (transport, storage)
		Mechanization and automation of work
		Application of constructive solutions
		Rational organization of work: - ensure timely preparation of the front of work for construction work; - increase the duration of the machines without dismantling; - rationally place materials and products to eliminate unnecessary transportation to the place of use; - use the most economical modes of transport.

Source: compiled by authors.

Thus, no matter what methods of calculating the cost of production in the construction industry will be used by enterprises, the main task is to reduce the cost of construction and installation works, as well as saving all types of resources - labor and material.

Conclusions

The lack of control over the expenditure of building materials artificially inflates the cost of construction of the company, therefore, the cost of construction and installation works is the most important indicator reflecting the activities of the construction organization, which determines the financial results, financial situation, and competitiveness of the construction organization. Therefore, constant monitoring of the formation of the cost of construction products and the search for ways to reduce it are necessary. The difference between the actual and the possible volume of construction and installation work, calculated on the basis of the largest average monthly (average quarterly) volume of work, shows the missed opportunities of the construction organization to increase construction volumes due to irregular work. The largest share in the cost of construction products is material costs, the size of which depends on:
- on the volume and structure of construction and installation works;
- norms of material consumption per unit of work performed;
- the cost of material resources;
- a change in the quality of building materials;
- qualifications of employees;
- volume of rejected products;
- the level of organization of control over the safety and efficiency of use of material resources.

In order to realize the most important function of management accounting in construction organizations - "management by deviations", it is necessary to periodically calculate deviations between the actual and possible (planned) volumes of work for each responsibility center, which are objects, sites, etc. For this, management reports for each responsibility center.

The analysis showed that for each stage of construction activity, the most characteristic methods and models of managerial accounting can be distinguished, and a reasonable and consistent combination, and in some cases the complex application of the described methods, will lead to the creation of a mechanism for consistent, targeted management of construction costs.

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THE EFFECT OF HUMAN RESOURCE INFORMATION SYSTEM APPLICATION ON EMPLOYEE SATISFACTION AND TURNOVER INTENTION

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Abstract. This paper aims to elucidate the effects of Human Resource Information System (HRIS) implementation on turnover intention and employee satisfaction. In the current research, a comprehensive case of e-Recruiting system implementation was investigated, to study unintended consequences based on the perception level of employees, during HRIS use. For this purpose, a conceptual model was used; developed and tested, which combines the attitude and belief factor of technology adoption with job-related outcomes. The data was collected from 167 HR employees working in a global firm, which implemented a novel HRIS for its hiring department. The results of the present study revealed that, employee satisfaction mediates the indirect effect of perception towards applying HRIS on turnover intention. The findings of the present study provide additional information on systems use and technology acceptance, by proposing work-related consequences, as significant extra success variables.

1. Introduction

In recent years there has been a rapid improvement in management and technology, which has led to enhanced commercial processes, however the professionalization of HR development has largely been ignored. Although human capital is a crucial factor in firm success, HR development like other support procedures, are often not suitably aligned and lack Information Systems (ISs) support. Therefore, HR development is incapable of identifying the strategic potential that is concealed in Human Resources Management (HRM). A fundamental method towards understanding it's potential, is to move from human resource management to e-HRM, by applying HRISs. Similar to enterprise resource planning (ERP) systems implemented in various fields, an HRIS

has the ability to systematize HR events in the HR sector (Marler & Fisher, 2013; Parry, 2011; Parry & Tyson, 2011; Shahreki, 2019a), and deliver well-organized HR facilities for the whole company. (Paauwe, 2004), which would subsequently help the HR department play a strategic role in the organization (Shahreki & Nakanishi, 2016; Strohmeier, 2009). During this HR change from administrative professionals to strategic allies (Bamberger, Biron, & Meshoulam, 2014), the HR employees' work routines, tasks, competencies, and capabilities, would also undergo a transformation. Subsequently, two important questions are raised; whether the HR workforce would agree to these changes, (Marler & Fisher, 2013) and whether these changes could have potentially unanticipated consequences. Although the organization level outcomes of this strategic transformation are well documented, HR employees are often significantly affected in unintended ways. Therefore, this research aims to elucidate the influence of strategic HRIS application on satisfaction of workers and turnover intention. Based on the review of TAM (technology acceptance model) as well as examining the literature on technology implementation and its effect on work-related issues, hypotheses were formed, based on how human resource information systems and job-related attributes and attitude affect HR employees' turnover.

2. Literature review and hypotheses development

Wixom and Todd (2005) carried out several studies to elucidate the value of HRIS implementation on workers or potential system operators. Their technology acceptance study offers effective models and theories to describe a person's approval of an information technology (IT) modernization. The Technology Acceptance Model (TAM) has been frequently applied (Davis, 1989; Venkatesh & Davis, 2000; Wu & Chen, 2017) to provide practical evidence to explore individual's beliefs and attitudes toward IT, and consequently the individual usage behavior (Venkatesh, Morris, Davis, & Davis, 2003; Venkatesh, Thong, & Xu, 2016; Prodani, Bushati, & Andersons, 2019), which has been discussed and evaluated in detail, in several investigations (Daghfous, Belkhodja, & Ahmad, 2018; Riemenschneider, Harrison, & Mykytyn Jr, 2003). The assumption of the current study is that, there is an association between attitudes towards a newly applied IT, and work-related consequences like, turnover intention and employee satisfaction. This would help understand the outcomes of IT perception and the general attitude toward using it. This postulation is in line with the earlier explained phenomenon that, the HRIS application also involves individual-level based values. In addition, this assumption is based on results of Holden and Karsh (2010) and Brown, Massey, Montoya-Weiss, and Burkman (2002), who propose that, turnover intention should be investigated following application of the new system. Therefore, in an attempt to address the specific objectives of the current study, a specific research model was developed to elucidate the influence of HRIS use in companies, on workers' satisfaction as well as the turnover intention. The particular developed model was founded on IT implementation studies (Davis, 1993; Taylor & Todd, 1995; Venkatesh & Davis, 2000) and research on work-related outcomes (Van Aken & Berends, 2018).

2.1. Attitudes towards HRIS
When an organization applies a new technology into their system, it is evaluated by the employees based on factors such as, usefulness and ease of use (Goodhue & Thompson, 1995; Shahreki, 2019a). For HRIS employees, the required skills for using the new technology, is an essential success factor (Shahreki & Nakanishi, 2016; Strohmeier, 2007), since the majority of HR workers do not possess the knowledge and skills to operate the system (Johnson, Lukaszewski, & Stone, 2016; Shahreki, 2019b). Consequently, the HR workers will not be able to take full advantage of the HRIS capacity, which as a result would cause them to evaluate the system negatively. On the other hand, HR employees who are knowledgeable on how the system operates and subsequently know how the system can ease their work, view the HRIS more positively. Therefore, there are some significant conceptual beliefs associated with HR employee understanding, to demonstrate the usefulness of an HRIS, which include, the extent to which a person considers that employing a specific system would aid in making their job execution better (Venkatesh et al., 2003). Furthermore, the more an employee believes that, an IT is easy to use, the higher the likelihood that they will believe in the usefulness of the system (Davis, 1989, 1993; Goodhue & Thompson, 1995; Venkatesh & Davis, 2000; Venkatesh et al., 2003; Venkatesh, Thong, & Xu, 2012). Review of

previous studies, the theoretical depiction of perceived ease of use of HRIS, and the identification of apparent usefulness, led to the development of the following hypothesis:

H1. There is a positive relationship between perceived usefulness and ease of use of implemented HRIS.

Generally, workers assess HRIS as helpful when they possess sufficient knowledge and skills, to use it with considerable ease (Ball, 2001; Johnson et al., 2016; Marler & Fisher, 2013). Under circumstances when it is challenging to use an HRIS, workers of the HR department demonstrate a negative perception towards applying the new technology (Beckers & Bsat, 2002; Kavanagh & Johnson, 2017). Thus, it is necessary that, HR workers are trained sufficiently so they assess the HRIS more favorably. Consequently, the following hypothesis is proposed while taking TAM into consideration (Al-Dmour, Masa'deh, & Obeidat, 2017; Davis, Bagozzi, & Warshaw, 1989; Venkatesh & Davis, 2000).

H2. There is a positive relationship between perceived ease of use and the attitude towards applying the system.

An employee acquires either a negative or a positive attitude towards implementing an HRIS, based on their assessment of its usefulness as well as the ease of use (Taylor & Todd, 1995). The employees balance their experiences related to HRIS application against their needs. They expect an HRIS to improve the efficacy of HR processes, regarding its usefulness (Dery, Grant, & Wiblen, 2009; Kavanagh & Johnson, 2017; Kovach & Cathcart, 1999; Ngai & Wat, 2006), contribution in various HR management decisions (Bratton & Gold, 2017), and automate administrative HR procedures (Marler & Fisher, 2013), so that implementing the HRIS improves HR employees' position within the organization and provides further career opportunities in the company (Hussain, Wallace, & Cornelius, 2007; Kovach & Cathcart, 1999; Noe, Hollenbeck, Gerhart, & Wright, 2017; Ruel, Bondarouk, & Van der Velde, 2007). However, new workflows, changing tasks, and additional responsibilities required by implementation of a new HRIS, might lead to a negative assessment (Ball, 2001; Dery et al., 2009; Noutsa, Kamdjoug, & Wamba, 2017). The review of previous studies, the theoretical description of the perceived usefulness of an HRIS, and the identification of the attitude regarding using the system, led to the development of the following hypothesis:

H3. There is a positive relationship between perceived usefulness and the attitude towards applying the system.

2.2. Influence of attitudes towards HRIS and work-related consequences

In general, the results of several studies have demonstrated an adverse association between worker satisfaction and turnover intention (Egan, Yang, & Bartlett, 2004; Yi, Nataraajan, & Gong, 2011), so if an employees' job satisfaction decreases, the desire to quit their job rises, and vice versa. Though during the first couple of months of their jobs, employee's satisfaction is quite stable (Moura, Orgambídez-Ramos, & Gonçalves, 2014), this eventually changes during the course of time, as they start to experience anxiety and stress (Avey, Luthans, & Jensen, 2009). These two variables are essential in a work-related context, in order to understand employee reactions and behavior, following changes (Egan et al., 2004). Turnover intentions are affected by an employee's ability in managing change, as well as their commitment to change (Freund, 2005). If an employee perceives a change as a threat and negatively, their intention to quit their job increases. Furthermore, an employees' job satisfaction decreases when a change is perceived as a threat, as it is displeasing for an employee to work in an unpleasant environment (Freund, 2005). Therefore, the perception and attitude toward changes in the organization, impacts job satisfaction, and subsequently turnover intention as well as voluntary turnover. Implementation of an HRIS in an organization is a real change, as opposed to a hypothetical change introduced in an organization, which affects work-related consequences. Consequently, the focus of the current research will be on both of these work-related consequences, and we will make an assumption that, an individual's attitude and perception towards the HRIS, has an effect on these variables. There are various complex reasons that demonstrate that, employees' satisfaction might alter during application of HRIS. For instance, the lack of or

inadequate communication concerning the reasons behind the change, could impart a different message altogether to the employees than what was intended, employees may assume that, the reason for applying the HRIS is to save on costs instead of easing the work of employees (Parry, 2011). This belief is in agreement with a study by (Joseph, Ng, Koh, & Ang, 2007), who proposed that, workers favor firms that place more importance on human capital, than organizations that are profit- and task-oriented. Additionally, if an HRIS is challenging to operate, workers satisfaction declines (Beckers & Bsat, 2002), which could be attributed to a lack of work motivation (Barrick, Thurgood, Smith, & Courtright, 2015; Grant, 2007). Furthermore, employees may need to alter their work practices and adapt to a novel routine (Dery et al., 2009; Kumarapeli & Peiris, 2018). The current study assumes that, a change in job situation that is viewed in a positive light, will result in enhanced employee job satisfaction, whereas one that is viewed negatively will lead to reduced employee satisfaction. In summary, stressful tasks and changing work tasks influence employee satisfaction, when a new HRIS is implemented. In light of previous studies, the perceived attitude theoretical description of an HRIS implementation, and identification of employee satisfaction, has led to the following hypothesis:

H4. There is a positive relationship between attitude towards using an implemented HRIS, and employee satisfaction.

The influence of increasing turnover intention is strengthened, as a result of worker's experiencing increased levels of stress related to learning new skills (e.g., Johnson et al., 2016; Marler & Fisher, 2013), in order to reduce costs (e.g., Marler & Fisher, 2013; Parry, 2011), improving procedures (e.g., Ball, 2001; Strohmeier, 2009), and saving time (e.g., Parry & Tyson, 2011), in order to hire well-qualified recruits in a shorter period of time. According to Joseph et al. (2007), an HRIS that is task-focused, concentrated entirely on improving the short-term performance of an employee, creates increased turnover rates than configurations, which is centered around the employee. Implementation of an HRIS could cause the role of an employee to change (Dery et al., 2009; Qadir & Agrawal, 2017; Wiblen, Grant, & Dery, 2010), which could result in disappointment and dissatisfaction and even lead to the employee quitting their job. In summary, implementing an HRIS results in changes of an HR employees' role and work routine. If an employee dislikes these changes which they attribute to the newly implemented HRIS, they will perceive the HRIS negatively, yet if they like the changes they will evaluate the HRIS positively. Thus, in the first example an employee experiences a decline in employee satisfaction, and subsequently turnover intention increases, while in the second instance, the employee's job satisfaction increases, while their turnover intention decreases (e.g., Avey et al., 2009). Because employee satisfaction has a direct influence on turnover intention, the following hypothesis is proposed:

H5. There is a negative relationship between employee job satisfaction and turnover intention.

H6. There is a negative relationship between a person's attitude towards applying an implemented HRIS and turnover intention.

Using employee satisfaction as the basis, hypothesis number 6 proposes that, an employee's attitude towards applying an HRIS, influences turnover intention directly. However, if a proposed HRIS causes change to an employee's work, the perception towards the item that caused the change, also effects employee satisfaction, since employee satisfaction represents an overall attitude towards the job situation. Figure 1 is the research model developed in this study, which illustrates HRIS effects on employees' satisfaction as well as turnover intention. The current study assumes that, the perception of changes caused by HRIS implementation in an HR department, affects employees' satisfaction and turnover intention. Therefore, a model was proposed that includes two technology-related beliefs; perceived usefulness and ease of use, as well as the employees' attitude towards the newly implemented HRIS, from technology acceptance studies, in addition to employees' satisfaction as well as turnover intention, which represent the work-related outcomes. In the following paragraphs, the experimental data for the research model proposed in Figure 1, will be presented. In order to assess the proposed model, this study

explored a well-known organization which supplies electronic parts, while it implemented an e-Recruiting system. This target company employs 70,000 workers, in approximately 150 different regions across the word, with a revenue of some billion dollars, yearly.
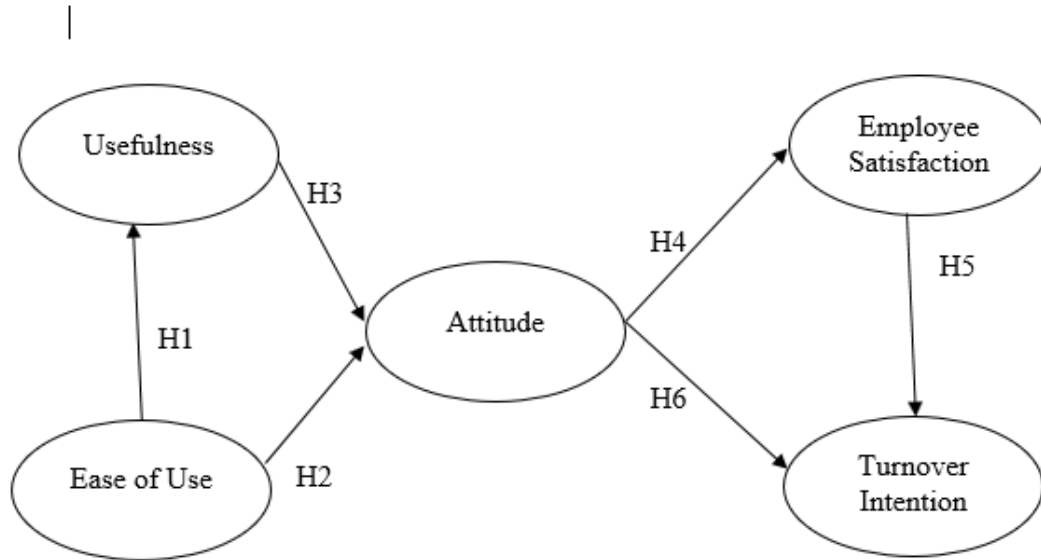
Figure 1. Conceptual model of an HRIS effect on employee satisfaction as well as turnover intentions of HR employees

3. e-Recruiting implementation

This target company proposed to use a novel e-Recruiting system from 2011. The novel e-Recruiting system was in the process of implementation during the early months of 2012 and was fully launched and functioning by June of 2012.

The target company is a multinational corporation and technology company, was founded on Jun 25, 1975. This target company employs 70,000 workers, in approximately 150 different regions across the word, with a revenue of nine billion dollars, yearly.

The key objectives for applying a new system, was to change the old outdated systems to something new, and to improve IT assistance in the course of recruiting. Previously, the old system was essentially a separate tool that could only support certain tasks that were involved in the course of recruiting and was mainly paper based. The Systems Applications and Products (SAP) E-Recruiting 6.0, Enhancement Package 6.0, was the new system implemented, which is a single organization-wide system, that has been implemented by all participants of the recruiting process. SAP is an Enterprise Resource Planning (ERP) software that supports daily work business. The SAP software plans logistics, financial, HR and several other business procedures. It is a software that is browser-based and employs a central database. The architecture of SAP is comparable to the recommended holistic design of an e-Recruiting system, (Holm, 2012). A novel recruiting procedure, consisting of six stages was developed, and entirely fixed inside the HRIS. The process begins with the department of on organization reporting a job vacancy, which is followed by them preparing an advertisement in print, on the company website, or at job portals for a job position. When the HR department receives an applicant's CVs, it in the HRIS database. In the next step,

through the use of the HRIS, the HR employees choose applicants and send their CV's and applications to the relevant HR manager in charge. Finally, the recruiter and HR manager collaborate in selecting an applicant for the job. By implementing the new HRIS, the organization has facilitated in the reduction of administrative tasks and helped transform the recruiting department's role as a strategic partner of the company, and to facilitate employees in achieving their full potential in terms of commitment and competency. The main aim of the organization for applying the new system, was to modify the recruiting department's role. Previously, the former procedure was structured in a different way, at different sectors of the company, so neither the recruiting management nor the central HR administration, could develop key performance indicators, and was unable to acquire a general idea of the recruiting condition within the organization. Thus, the old system did now allow for sufficient monitoring of the process, neither could efficacy, effectivity or quality be assured. However, with the implementation of the new HRIS, the complete process can be managed and monitored by the organization, and key performance indicators can be measured. For instance, the organization can evaluate the usefulness of job advertisements in various channels, as well as monitor and manage the costs and time of hiring new employees. This would facilitate in improving the recruiting process and measure, continuously. Furthermore, previously each branch of an organization was in charge of finding recruits for their job openings, no coordination between the different branches existed, when recruiting qualified personnel. However, upon implementation of the novel system, every application received, is entered into the system, and collected into one large unified talent pool, which every recruiter of the organization has access to. Moreover, following the implementation of the novel system, a new position of the HR employee has also been developed, the "task manager". The duties of the talent managers are, to detect vital vacancies, as well as to identify vacancies with high talent insufficiency, and to develop lasting action to fill them up. The additional tasks of the talent manger include, supporting local branches in situations whereby a high talent insufficiency vacancy has to be filled, since they are the main operators of the combined talent pool. They are also in charge of examining external sources like, databases of job boards as well as databases like LinkedIn, or other social media sites. Therefore, through the implementation of the novel system, the company has optimized, computerized, and combined the various phases of the process of recruitment, and providing the HR department with a more strategic orientation in the company. The HR employee's position within the organization has transformed from that of only administrative support, to that of business consultant. With the time saved due to the new system, they are able to accomplish new tasks.

4. Research methodology

In order to collect experimental data for the research model that has been developed in the current study, a survey was designed to support the assumptions. This survey was conducted during the HRIS implementation process within the target organization, and HR employees' perceptions toward the implemented system, were evaluated, and the resultant work-related outcomes were recorded. The implementation settings will be described in the following sub-section, and the survey instrument will be introduced in the subsequent section.

4.1. Data collection and sampling

The current empirical study was conducted in 2018, in order to collect data on the opinions of employees towards the implemented e-Recruiting system. That research surveyed 500 HR workers at the implementation phase, who were all power users of the newly implemented HRIS. The inclusion criteria were that, the individuals must employ the system on a regular basis, every day in order to complete their work tasks. The employees were questioned on their beliefs and attitudes towards the ease of use as well as the usefulness of the HRIS, and they were also asked about their level of satisfaction as well as their turnover intentions. This questionnaire was online for a total of four weeks, and a total of 183 (36.6%) completed questionnaires were received, out of which 16 were incomplete, so only167 were usable. The top managers as well as project managers supported the survey, they requested all workers of the HR department to take part in the questionnaire and allowed for the 500 workers involved to be directly approached, throughout their coaching periods as well as for individual interviews. The

survey was carried out anonymously, and the respondent's identities were not disclosed. In an attempt to reduce the chances of social desirability, data on employee satisfaction as well as turnover intention, were not disclosed to the managers of the organization, which was clearly mentioned in the guidelines of the survey. Analysis of collected data from participant's questionnaires revealed that, 83.2% (n=139) of the participants were men, and 16.8% (n=28) were women, so the majority of participants were male. In addition, 73 participants (43.7%) were aged between 36 to 45 years, 93.4% were married, and 83.8% of participants possessed a bachelor's degree. The work experience of 56.9% of participants was between 12 – 17 years.

4.2. The Survey instrument
The questionnaire comprised of five major categories namely, ease of use, usefulness, attitude, employee satisfaction, and turnover intention, which are discussed below.

4.2.1. Ease of use
The measurement items that were employed to assess ease of use, were adapted from Davis et al. (1989) study. A total of four items were established, to calculate the ease of use of the implemented HRIS. For example, one item is: "My interaction with the new e-Recruiting system would be clear and understandable".

4.2.2. Usefulness
The measurement items that were used to evaluate usefulness, were adapted from Davis et al. (1989) study. A total of four items were established, to evaluate the usefulness features of the implemented HRIS. For example, one item is: "Using the new e-Recruiting system increases my productivity".

4.2.3. Attitude
An employee's attitude was measured using the method adapted from Taylor and Todd (1995). A sum of three items was established to measure the attitude factor towards using an HRIS. For example, one item is: "Using the new e-Recruiting system is a good idea".

4.2.4. Employee satisfaction
The measurement items used to explore employee's job satisfaction, were adapted from Thatcher, Stepina, and Boyle (2002). A sum of three items were proposed to measure the employee's satisfaction at the work place. For example, one item is: "Overall, I am satisfied with my job".

4.2.5. Turnover intention
The measurement items used to evaluate turnover intention, were adapted from Thatcher et al. (2002). A sum of three items were proposed, to calculate an individual's intention to leave their job voluntarily. For example, one item is: "I think often about quitting my job at my current employer". A seven-point Likert scale was used (1='strongly disagree' to 7='strongly agree') to measure the items for all five constructs, (appendix A).

5. Data analysis

The above-mentioned measurements were applied in order to assess the proposed research model of the current study, experimentally. In order to support the hypotheses, the developed research model was transferred to a structural equation model (Kline, 2015). The Partial Least Squares-Structural Equation Modelling (PLS-SEM) and Smart PLS, were employed in the current study (Hair, Hult, Ringle, & Sarstedt, 2016), since they are suitable for small samples (Hair, Sarstedt, Ringle, & Mena, 2012). However, the collected data was analyzed prior to presenting the results, to verify whether it was influenced by common method bias.

5.1 Measurement model assessment

In order to evaluate the common method variance, the Harman's one-factor test was used. The findings revealed that, the biggest factor identified was, 36.3% which was smaller than 50% of the variance. Essentially, the problem of a single factor, which is a main factor, is that it does not exist. Therefore, there is no significant problem related to the common method variance bias (Malhotra, Kim, & Patil, 2006). The indicator reliability indicates that, the variance degree of an indicator is extracted from the latent variables. Every rate has to be 0.7 or greater, to justify from the latent variance a minimum of 50% of the variance, through the indicators (Nunnally & Bernstein, 1994), which was fulfilled. Furthermore, the significance degree of the complete loadings is at least 0.10, which is substantially significant, which was verified by carrying out the bootstrap method with 5000 samples. At the construct degree, The Average Variance Extracted (AVE) and Composite Reliability (CR), concepts were used to verify quality (Fornell & Larcker, 1981). As shown, the AVE is more than 0.5 while the CR is more than 0.7 (Table 1), hence the proposed research model satisfies two of the benchmarks.

Table 1. Loadings, Validity, AVE, CR, α.

First-order constructs	Items	Loadings	AVE	CR	α
Ease of Use (EU)	EU1	0.77	0.63	0.88	0.85
Scale type: Reflective	EU2	0.81			
	EU3	0.83			
	EU4	0.81			
Usefulness (UF)	UF1	0.76	0.62	0.88	0.84
Scale type: Reflective	UF2	0.85			
	UF3	0.84			
	UF4	0.82			
Attitude (AT)	AT1	0.71	0.63	0.89	0.87
Scale type: Reflective	AT2	0.72			
	AT3	0.81			
Employee Satisfaction (ES)	ES1	0.85	0.69	0.92	0.88
Scale type: Reflective	ES2	0.86			
	ES3	0.84			
Turnover Intention (TI)	TI1	0.76	0.65	0.89	0.85
Scale type: Reflective	TI2	0.83			
	TI3	0.85			

The discriminant validity explains the degree to which one measurement item differs from the other, so that the square root of AVE is involved on the diagonal of latent variable correlation (Table 2). Since the numbers of the square root are larger than the equivalent construct correlations (Fornell & Larcker, 1981; Schaupp, Carter, & Hobbs, 2009), it can be concluded that, this particular condition has been achieved, and subsequently supports the validity of the measurement model.

Table 2. Assessment of discriminant validity

	EU	UF	AT	ES	TI
EU	**0.81**				
UF	0.47	**0.82**			
AT	0.63	0.57	**0.75**		
ES	0.43	0.61	0.53	**0.85**	
TI	0.52	0.51	0.55	0.47	**0.82**

Notes: N=167; Diagonal measures (bold) are the square root of the average variance extracted (AVE) for every construct; EU= ease of use; UF= usefulness; AT= attitude; ES= employee satisfaction; TI= turnover intention.

5.2. Structural model

To be able to assess the structural model proposed in the present study, the coefficient of determination (R^2) and every path coefficient's significance degrees, were used (Hair et al., 2016). Figure 2 illustrates that, the TAM perceived ideas and attitude describe 36% of the variance of an employee's satisfaction. Furthermore, two attitudes towards IT and employee's satisfaction describe approximately 52% of the variation observed in turnover intention. The R^2 of supposed usefulness was, 55% and for attitude was, 57% (Fig. 2). Regarding the path coefficients, only one of the hypothesized paths was found to be non-significant. The particular sole path which was not significant in the current proposed research model, was the association between turnover intention and attitude. The data results of the tests used to validate the hypotheses are show in Table 3 and Figure. 2.

Table 3 Results of the hypotheses with PLS (Basic Model - bootstrap results)

Constructs	Hypotheses	Sign	Estimate	t-value	Remarks
EU → UF	H1	+	0.13$^{(*)}$	1.91	**Supported**
EU → AT	H2	+	0.26**	3.07	**Supported**
UF → AT	H3	+	0.16*	2.31	**Supported**
AT → ES	H4	+	0.29**	3.38	**Supported**
ES → TI	H5	-	0.15*	2.14	**Supported**
AT → TI	H6	-	0.05	0.71	Not supported

Notes: N = 167; **$p < 0.01$; *$p < 0.05$; $^{(*)}$ $p < 0.10$. EU= ease of use; UF= usefulness; AT= attitude; ES= employee satisfaction; TI= turnover intention.
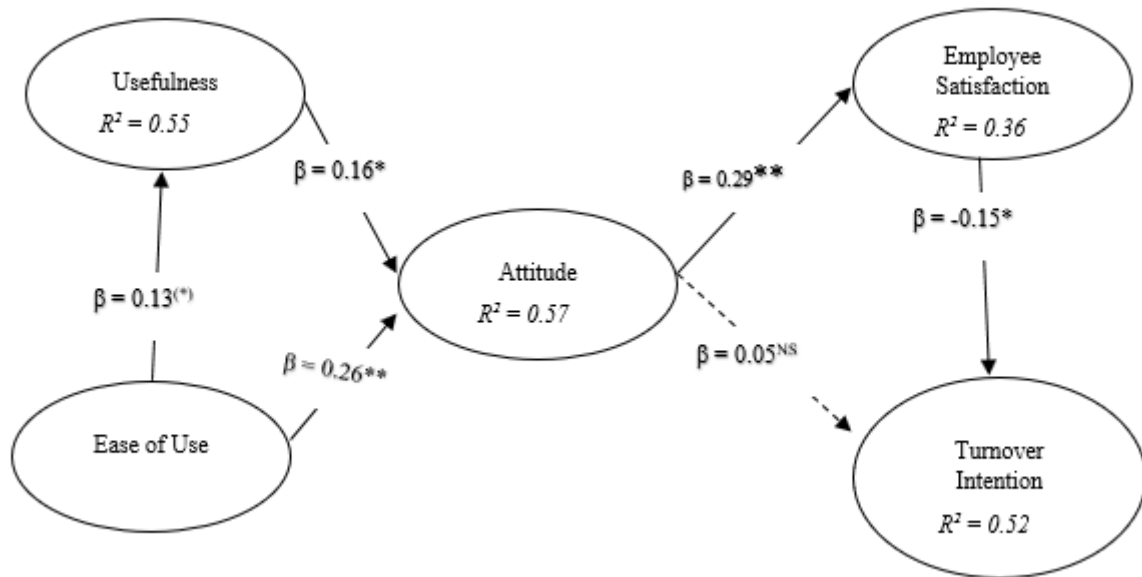

Figure. 2. Direct and indirect effects of HRIS on HR worker's satisfaction as well as turnover intentions

Notes:

1. ** $p < 0.01$; * $p < 0.05$; (*) $p < 0.10$; NS=Non-Significant

5.3. Mediating effects of employee satisfaction

In the current research, the three-step approach Baron and Kenny (1986), a bootstrapping method Preacher and Hayes (2008) and the Sobel test (Sobel, 1982) was used to examine if an individual's satisfaction facilitates the association among attitude towards an HRIS, and turnover intention. Baron and Kenny (1986) have proposed that, a mediating consequence exists, if the following three situations are met; the first condition is that, the independent variable should predict the mediator, the second condition is that, the dependent variable must predict the independent variable, and finally, the predictive power must be reduced, when the mediator is integrated into the association among dependent and independent variable. The model used in this study revealed that, the beliefs and outlooks regarding the HRIS had an effect that was significantly positive on the mediator employee satisfaction ($\beta = 0.27$; $p < 0.01$), with an effect that was negatively significant on the dependent variable turnover intention ($\beta = -0.17$; $p < 0.05$). The significant influence of beliefs on a worker's turnover intention ($\beta = 0.05$; $p > 0.4$) reduced, but the effect of employee's satisfaction on turnover intention ($\beta = -0.15$; $p < 0.05$), increased when employees' satisfaction was combined with the association between turnover intention and attitude. This implies that, worker's satisfaction completely mediates the effect of beliefs on turnover intention. Furthermore, the Sobel test (Sobel, 1982) was applied, as it is a moderate, meticulous, and affirmative technique, to assess mediation (Baron & Kenny, 1986). The data ($Z = -2.26$; $p < 0.01$) revealed that, the current model has an indirect influence. Lastly, a bootstrapping technique Preacher and Hayes (2008) was performed, and the results revealed that, the indirect influence of beliefs regarding HRIS on turnover intention, via workers satisfaction was -0.07, and the value ranging from -0.113 and -0.041 was for the related 95% bias-corrected confidence interval (1000 bootstrap resamples). The hypothesis was supported through this method, that an indirect mediating effect is present, since there is no zero in the bias-corrected interval.

6. Discussion and Conclusion

Investigating the unpremeditated outcomes of HRIS use in the office, is very important. Based on our current findings and from a negative viewpoint, any organization has to expect that a novel HRIS introduction can be considered as annoying and threatening by HR workers, which could result in decreased employee satisfaction, and subsequently increased turnover intentions. On the other hand, from a positive viewpoint and considering the results of this research, if the introduction of a novel HRIS is viewed in a positive way, employee satisfaction would increase, and consequently turnover intention would decrease. These conclusions based on the data obtained from the current single-point experimental study, have numerous consequences for technology adoption research as well as e-HRM, as follows:

6.1. Theoretical implications

The results of current research reveals that, aside from the strategic and economic influence for the organization, that has been discussed and intended, in previous research (Marler & Fisher, 2013; Parry, 2011; Ruel et al., 2007), an HRIS application, has work-related effects on every individual, who has to work with the system every day. This impact is noticeably evident in workers satisfaction as well as turnover intention. The findings of this study imply that, application of an HRIS, which is perceived positively by HR-personnel, as useful and easy to use, is the prerequisite of job satisfaction within the workplace, in situations where HRIS change is compulsory. This finding is in agreement with those of Bondarouk, Ruël, and van der Heijden (2009), who suggest considering specific HRIS stakeholders, namely, HR employees, (Parry, 2011), and who consider it crucial to determine HR employee's attitude towards the HRIS applying process. In addition, the results of the current research also demonstrate that, if HRIS use is viewed as threatening, it decreases employees' job satisfaction and increases turnover intention. Thus, if organizations do not achieve a positive perception towards the HRIS implementation, the HR employees would be dissatisfied. The drawback for organizations is that, negative incidents outweigh positive ones, over time (Ito, Larsen, Smith, & Cacioppo, 1998). For instance, the simplified work task of an employee may last for a short duration, but the negative consequences including a change in work routine, or HR

characteristics, have ongoing consequences. Accordingly, these adverse experiences cause a decline in individual's satisfaction, and subsequently an increase in turnover intention. Furthermore, the findings of the current study imply that, employees' satisfaction as well as turnover intention, which are considered as work-related consequences, are both instances of unpremeditated individual-level outcomes following HRIS application. In the e-HRM outcomes setting, Parry (2011) states that, the previous studies lack a clear, unambiguous concept of e-HRM consequences. Furthermore, according to Parry and Tyson (2011), problem awareness is limited in both practice as well as research, concerning (un)intended consequences of HRIS use. Parry (2011) recognizes the positive outcomes of e-HRM include, speeding up processes, lessening costs, enhancing quality, and HR achieving a more strategic position within the firm, which can be classified under organizational outcomes. Moreover, Parry concluded that, undesired or unexpected consequences may also be observed, aside from the desired and expected consequences of e-HRM implementation, which has not been previously explored in earlier studies. Therefore, he suggests that more studies should be conducted to increase awareness concerning (un)intended consequences following the application of an HRIS. The current study intends to provide a direct answer to this suggestion, as this study aims to assess the individual-level consequences following the implementation of an HRIS. Not only does HRIS implementation have organizational consequences (providing HR with strategic position and process improvements), but it also affects individual level consequences including, employee satisfaction and turnover intention. Therefore, individual-level consequences should be incorporated as a new dimension of HRIS-consequences research, which is essential when examining success models of HRIS implementation (e.g., Beckers & Bsat, 2002; Kavanagh & Johnson, 2017). Kavanagh and Johnson (2017), state that an HRIS is considered successful when an old system is completely replaced by the new system, if it is works effectively, and if it is accepted widely throughout the organization. However, it is questionable to classify an HRIS implementation as successful solely based on fulfilling the criteria above, if workers start to apply the HRIS, but their satisfaction goes on a decline and leads some to even leave the organization. Thus, based on our research findings, we suggest that the classification of the success of HRIS applications be extended to comprise individual-level outcomes as well, as an added factor to the measurement of success of an organization. Thus, we define the application of an HRIS as ineffective if it decreases employee satisfaction which subsequently increases turnover intention. Furthermore, this study suggests that, an HRIS implementation is defined as a satisfactory success, under circumstances when it does not have any influence on the satisfaction of HR personnel and subsequent turnover intention and is described as considerably successful when the satisfaction of employees increases and turnover intention declines. Thus, (un)intended consequences can be considered as an extra element of the success of application of HRIS (Hussain et al., 2007; Noe et al., 2017). The HRIS implementation intended consequences in the current study such as, automation of routine and operative tasks, allows HR personnel more time to pay attention to strategic tasks in HR. This progress provides HR employees with means to tasks which are more strategic and people-oriented; prior research reveals a change in HR identity from solely an administrative role to a strategic partner in a firm, or employee champion (Hussain et al., 2007; Noe et al., 2017). These changes also require changes in HR employees' work routines, tasks, capabilities, and competencies, and their individual approval of the various changes (Dery et al., 2009; Wiblen et al., 2010). Though, if HR employees perceive the HRIS implementation negatively, as key facilitators of the strategic HR role, it could be argued that there is a lack of acceptance of the new strategic role as employee job satisfaction decreases. A decrease in job satisfaction could be attributed to the fact that HR employees usually implement HRIS only for automated routinized responsibilities (Johnson et al., 2016; Marler & Fisher, 2013), and ignore its strategic potential. As a result, it is assumed that the HR employees role in the organization has not changed. It is therefore necessary that, the transformation from the administrative role of HRM to the role of a strategic e-HRM, involves an incorporation into the business organization, to make sure that employees are involved and confident, playing their role as advocates and agents of change (Kavanagh & Johnson, 2017; Ngai & Wat, 2006). The results of this study revealed that, the new HRIS implementation which allows for HRM transformation, can influence individual work-related outcomes, which is related to HR employees' identity. In this study, the HR management introduced the project to facilitate the HR employee champion and strategic partner role, and consequently the work-related identity of the HR employees of the organization, have changed.

The majority of HR employees appreciated the increase in automation of HR tasks, although the findings showed that, some were opposed to the new HR role.

However, HRIS application perception and the changing HR identity, are distinct factors for the degree of acceptance of an HRIS, which is significant for prospective studies, when examining the influence of a system on individual work-related outcomes, since approval of the novel position of the HR is an essential factor in the implementation of an HRIS. Moreover, the results of current study provide significant contributions to the literature on IT adoption, because the question posed by Brown et al. (2002) was answered concerning, factors affecting individual attitudes in obligatory settings. This study also provides support that, employee attitude towards an IS, has an influence on employee satisfaction and subsequent turnover intention. As employees in an obligatory setting, do not have the freedom to choose from another IS, nor the option to follow a routine that does not involve an IT system, it is via transforming the employees' satisfaction and subsequent turnover intention, that the system can be examined. The results can support that, beliefs and attitudes can potentially have a substantial effect on their view of the work setting and the company (Brown et al., 2002). The findings also revealed that, attitude concerning the IT has a direct influence on employee satisfaction in their condition in the workplace. The current study took a similar approach to Morris and Venkatesh (2010) and Konradt, Hertel, and Schmook (2003), by combining employee satisfaction and turnover intention into IT adoption studies, which allows us to take into account additional dependent variables, instead of concentrating solely on intention to employ an IT. Employees satisfaction and subsequent turnover intention are two possible dependent variables, that can be used in future investigations in obligatory usage settings. Satisfaction of workers and subsequent turnover intentions can be employed, if an individual is concerned in assessing single behavioral outcomes of using an HRIS (Morris and Venkatesh (2010), as an employee might implement the novel HRIS as required by the managers, which would subsequently influence their satisfaction and turnover intention in a good or bad way. According to the current findings, it is apparent that, there is a difference in employee satisfaction and turnover intention, which is noticeable during HRIS application, and can be predicted by an employees' approval of an IT. The results of this study has elucidated the attitude, behavior association of IT in the IT approval model, as (Venkatesh & Davis, 2000) proposed. In this study, we have incorporated two IT-independent attitudes namely; turnover intention and employee satisfaction, into the proposed model. We can therefore deduce that, assessment of an IT, has an influence on IT-independent beliefs specifically, employee satisfaction and turnover intention. Furthermore, results of the present research study, is also important for user resistance studies. Two additional types of user resistance aside from those already recognized (sabotage, resist, workaround), include the two unintended consequences of system implementation, namely declining employee satisfaction and increasing turnover intention (Ferneley & Sobreperez, 2006). In situations where an employee is forced to use an implemented HRIS by the management, but feels threatened by it, the noticeable consequences and behaviors include, declining employee satisfaction and rising turnover intention. Therefore, the desire to leave the job and the consequential intended turnover, is an additional instance of employee opposing attitudes, following implementation of the novel IS. Lastly, declining employee satisfaction, is another behavior, which are equally noticeable variables of user opposition.

6.2. Managerial implications
The research findings on HR identity, HRIS consequences, and technology adoption studies can also be applied in practice. The results reveal that, a company can impact satisfaction of workers and turnover intention positively, if they can ensure the usefulness of the system, as well as ease of use. For instance, in the target organization, there was decreasing satisfaction of employees, amongst workers who felt intimidated by the numerous clicks involved and thought that operating the system consumed too much time. Furthermore, several employees also evaluated the waiting time while opening attachments negatively, as they complained that it was troublesome for their work routines, particularly in those sub-departments that have to go through a great number of applications. An additional negatively perceived aspect was, entering applications that were on paper manually, mainly in sections promoting blue-collar positions, as such applications were received abundantly in those departments. In addition,

not all employees approved of the introduced quality control for the job ads publication. Therefore, the organization concentrated on the usefulness and ease of use of the newly implemented HRIS, to encourage approval in the phase following implementation. The findings of this study additionally revealed that, workers' turnover is not a immediate result of implementation of an HRIS, but rather mediated by employee satisfaction, and organizations are capable of reducing turnover intentions by making sure that, employee satisfaction remains high, with several measures such as, work-life balance and reward systems. The above-mentioned measures could balance the negative influences of the newly implemented system, and thus decrease turnover intention. Another implication of this study revealed that, project managers must persuade HR personnel of the usefulness and ease of use, and to furthermore assure that the employees, have a positive perception and attitude towards the altering HR identity. Under circumstances when workers are confident regarding these HRIS features, and approval for the altering HR identity can be achieved, employee satisfaction improves, and turnover intention declines. According to the analysis of the complete mediation influence of IT attitudes and beliefs on turnover intention, through employee satisfaction, no immediate turnover intention regarding IT application, was observed. Therefore, workers will stay in the company, even though their satisfaction might decline. Based on the qualitative data of the current study, only after a period of time, when perceptions toward the system becomes more negative then, turnover intentions occur. Organizations can take active measures to prevent decreasing employee satisfaction in the post-implementation stage, before intent develops into behavior, in order to keep turnover intention as low as possible.

6.3. Limitations of study and future research

The findings of this research cannot be generalized, because the experimental data was obtained from one firm and from the e-Recruiting system introduction in a single company, where all HR personnel originated from one country. Thus, national and organization characteristics must be investigated in prospective studies. Workers originating from other countries with different cultural backgrounds, could perceive the obligatory HRIS implementation in a different way. Furthermore, this study focused on unanticipated consequences, so we only concentrated on two independent variables namely; anticipated usefulness and anticipated ease of use. Though both variables are adequate for the objectives of this study, to elucidate employees' attitudes towards the implemented HRIS, and the influence of the new HRIS on employee satisfaction and turnover intentions, additional precursors of turnover intentions such as, commitment to the company or attitudes of perception including computer self-efficacy and subjective norm, should be included. For future studies on the success of HRIS implementation, work-related consequences should be included as another measurement of achievement of an HRIS application. Furthermore, studies on HRIS outcomes, ought to incorporate the individual-level consequences, which has been proposed, along with organizational consequences, to provide a more comprehensive portrayal of HRIS consequences. In addition, future studies should investigate how overall attitude towards the new HRIS implementation, impacts work-related outcomes over a period of time.

Appendix A. Measurement Scales

Ease of Use (EU):
EU1 "my interaction with the new e-recruiting system would be clear and understandable".
EU2 "it would be easy for me to become skillful at using new e-recruiting system".
EU3 "overall, I would find the new e-recruiting system easy to use".
EU4 "learning to operate the new e-recruiting system is easy for me".
Usefulness (UF) a
UF1 "overall, I would find the new e-recruiting system useful in my job".
UF2 "using the new e-recruiting system enables me to accomplish tasks more quickly".
UF3 "using the new e-recruiting system increases my productivity".
UF4 "if I use the new e-recruiting system, I will increase my chances of getting a raise".
Source: a Davis et al. (1989).
Attitude (AT) b
AT1 "using the new e-recruiting system is a good idea".
AT2 "using the new e-recruiting system is a wise idea".
AT3 "using the new e-recruiting system is pleasant".
Source: b Taylor and Todd (1995).
Employee Satisfaction (ES) c
ES1 "overall, I am satisfied with my work".
ES2 "I am satisfied with the way I work at the moment".
ES3 "I am satisfied with the important aspects of my work".
Turnover Intention (TI) c
TI1 "I think often about quitting my job at my current employer".
TI2 "I intend to quit my actual job".
TI3 "I think about leaving my actual employer".
Source: Thatcher et al. (2002).

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BUSINESS SCALING THROUGH OUTSOURCING AND NETWORKING: SELECTED CASE STUDIES

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Abstract. A business scaling on the basis of outsourcing and creation of an entrepreneurial network is discussed in this article.The network allows to expand the resource capabilities of its member enterprises. This aspect seems significant in the case of the inadequacy of researches that consider the period of the emergence of network structures. The proposed nanocorporation model assumes a network of independent, specialized supplier companies with a small coordinating integrator. In nanocorporations, the core company outsources most of its functions and develops its main competency, specializing in planning, corporate management, and marketing. An expanding affiliate business network provides fast business growth, minimization of costs, high mobility. The article examines the process of creating an entrepreneurial network using the example of three Kazakhstani small and medium-sized businesses. On the basis of the analysis, the stages of the decision-making sequence are proposed while creating a network. Case study method is used as the main one in the work.

Keywords: network; outsourcing; nanocorporation; entrepreneurship, small and medium business (SME)

1. Introduction

The activity of business entities present on the market represents the key instrument triggering the economic growth and innovativeness of the economy. A lot of businesses are looking for innovative ways to improve efficiency and maintain competitive advantage in order to survive (Tvaronavičienė, Razminienė 2017; Eddelani et al. 2019; Prodani et al. 2019; Amraoui et al., 2019).

Innovative enterprises, including start-ups defined in various ways, which through their innovative undertakings that concentrate on seeking their unique developmental path, can quickly dominate the national and global markets, therefore they are of considerable importance for the economy. The reason why new and small businesses have become key players in the innovation process has been their ability to identify and exploit business opportunities which emerge as a result of technological, competitive and market developments (Hlushko et al, 2015; Islamgaleyev & Uruzbayeva, 2018).

Modern technologies aimed at improving algorithms and methods of data collection, storage and processing are tailoring the quality of output information for the end user, including the development of artificial intelligence systems, whose analytical modules and methods are used to filter out unnecessary information and search for dependencies between socio-economic processes (Dyachenko at al, 2018; Dellis et al., 2016; Nenkov et al, 2016; Petrova et al, 2018; Nenkov et al, 2017; Tvaronavičienė, 2017; Tumalavičius et al, 2017).

Nowadays there are platforms, information and communication technologies that can be rented when they are needed. This has undermined the strong feedback between fixed costs and output, which determine economies of scale due to the large scale typical of large corporations. According to experts small firms and their networks occupy niche markets, competing with large companies, which are weighed down by many years of investment in large-scale production and distribution networks (Hemand & Kevin, 2018; Kolodiziev & Boyko, 2015; Koval & Pukała, 2017; Ponomarenko & Gontareva, 2017; Bogomolov at al, 2018).

Researchers have studied scalability in 90 Scandinavian companies, as well as the experience of several well-known companies, including Google, Apple and Groupon. (Nielsen and Lund, 2018). In the the study, they identified five models (patterns) on the basis of which companies can achieve business scalability: through new distribution channels; through the release of bandwidth limitations, overcoming bottlenecks; through the multiplicity of the role of customers and other partners; through creating a common platform. Finally, the fifth model for scalability and business growth, which is in the focus of this study, is attracting third-party investments in the process of outsourcing various types of activities when external partners of the core company become participants in the same business model (network).

The subject of this study is the emergence of an entrepreneurial network based on outsourcing. They also contribute to its innovation and gaining a competitive advantage on the market (Pukala et al, 2018; Pukala & Petrova, 2019; Galaso, Kovářík, 2018).

This aspect of the study of the emergence and origin of network business structures with a focus on their entrepreneurial character and managerial innovations is poorly covered in the literature. More attention is paid to a retrospective survey of the emergence of individual firms, or a description of product or technological innovations (Damanpour & Aravind, 2012; Nievesatal, 2018).

2. Entrepreneurial networks and nanocorporation model

A number of studies confirm that network management is an effective form of economic coordination that contrasts and competes with markets and vertical hierarchies (Dedeurwaerdere at al, 2007). The development of network structures and cooperation allows firms to be more competitive by overcoming limitations - both traditional hierarchical organizations and spontaneous market regulation.

In this study, the management approach based on theories of strategic management and interorganizational relations is taken as the basis, which does not exclude intersections with other theoretical platforms. Networks are seen as a mechanism of "intercompany coordination, characterized by informal social systems, compared with bureaucratic structures within firms and formal contractual relationships between them" (Jones et al, 1997). At the same time, it is assumed that network entities, successfully operating in an uncertain and competitive environment, can significantly provide control control without controlling ownership of assets.

In terms of content, ordinary small and medium-sized businesses mainly consist of routine actions devoid of novelty in disseminating "well-known products to well-known customers". This article is about an entrepreneurial firm and a network focused on business scaling; the focus of the study is the innovative nature of the activity, a significant change in the organizational context and redefinition of property.

At the first stage, the enterprise network integrator company itself reaches a certain level of operational efficiency, implements advanced working methods, creates a certain brand. This allowsto attract new members, conclude franchise agreements and have leverage over the participants in the franchise network, without controlling the ownership of its members. Researchers call such networks asymmetric hierarchical networks based on formal contracts, a coordinating apparatus, and a system of rewards and fines (Grandori, 2001).

It is important for an integrating company to find the right balance between excellent competence in industry technology, brand building, on the one hand; and the integrating role in the network based on franchise agreements and effective corporate management, on the other hand (T-model of a network enterprise, Figure 1). It is in the fulfillment of this dual role by the integrating company that it is difficult to imitate abilities that create sustainable competitive advantages and accelerated network growth.
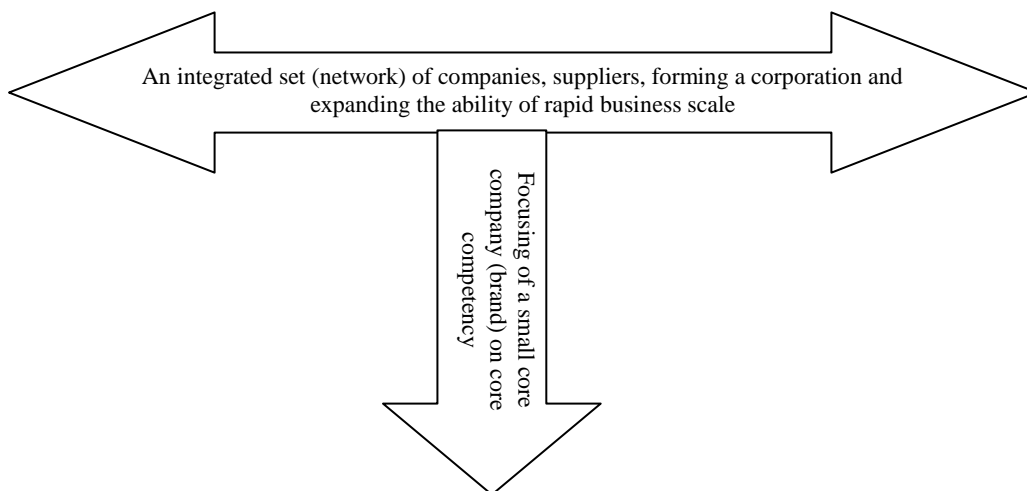

Figure 1. T-model of a network enterprise
Source: Dzhalkibayev&Musapirov, 2018

The key competency of the managing company (integrator) becomes the function of coordinating the work of the supplier network, corporate management and marketing, and acting as a strategic architect and, in part, as controller. While the function of execution of customer orders, creation and maintenance of physical infrastructure, operating regulations and processes become remit suppliers are united in business network.

Authors call this T-model a nanocorporation. The nano-particle emphasizes the small size of the integrator; the second part of the word indicates the presence of many individual companies that are connected by a single concept and a common brand of the corporation. The horizontal line of the letter T means the use of opportunities and the scaling up of the corporation business, the vertical line means the integration of the core competence of the integrating company. Nanocorporation (lat. Nanos– gnome, dwarf, corpus- body, arch, whole) is a set of independent, specialized supplier companies with a small coordinating core link at the head (network enterprise). In nanocorporations, business processes are not so much directed inside the organization, but focus on integration with suppliers, on ensuring the coordinated work of companies and people involved in the process.

The term nanocorporation (nano-corporate, nano-core, nano-size corporate center) was proposed by Isobel Baylis and other authors in a series of reports by the consulting company KPMG "CFIO-Fast Forward 2035" (KPMG, 2013). According to KPMG researchers, the main advantage of nanocorporation is the small, low-cost and mobile center around which the business is built.

In the nanocorporation, the coordinating company ("network broker" in the terminology of Miles and Snow, 1986) has a dual role: its main competence as a manager is to provide a general direction of development and results for the entire network as a whole, including solving marketing and promotion issues brand group.

The other competence is the role of a network architect, that is, the selection of new suitable participants, their integration into a single network through related processes (negotiations, training, transfer of work standards). The core company coordinates the actions of many independent actors through the control of logistics flows, regular feedback, a group social network, etc. The integrator company takes responsibility for compliance with the required quality parameters and timely delivery of goods (including to external customers for the network). Partners, however, focus their efforts on operational activities within the established territory.

It is known that firms often experiment with their organizational boundaries in search of effective forms of conducting business: from vertical integration to full outsourcing and vice versa (Figure 2).
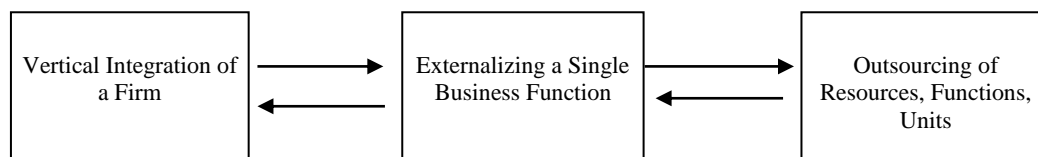
Figure 2. Change in the boundaries of the company
Source: compiled by the authors

The key variable in determining the boundaries of the company is the specificity of its assets, the narrowness of their application, when they have little value outside of specific transactions. The company's assets (within the RBV resource concept) include not only the company's personnel and physical assets (equipment, buildings, etc.), but also invisible assets such as the degree of intra-company horizontal integration of business processes, collective knowledge, regulatory forms of control andetc .. As the researchers note (Jermain at al., 2011), with high environmental uncertainty, the organic type of business structure, which has a more network, decentralized and informal character, is more effective. Vertical integration is more likely if the complexity of the product is

large or a significant proportion of the specific resource in the total cost of the supply chain. According to the authors's statement, the focus on low costs has a significant impact on the level of outsourcing in production (Gray et al, 2009).

To improve the coordination of companies and optimize business processes in the network (supply chain), the following assumptions (hypotheses) were proposed (Figure 3)**:**
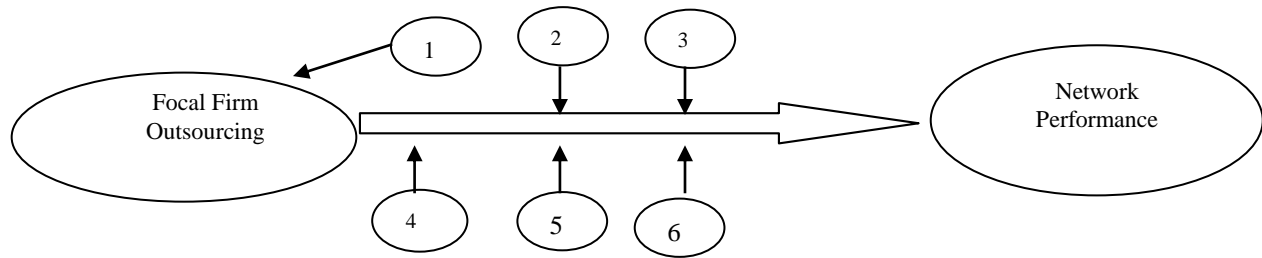
Figure 3. Focal Firm Outsourcing Link Model and Network Performance
Source: compiled by the authors

1. The higher the "tuning" of the initial assets of the focal (core) company to fulfill the orders of various clients (low level of specificity of assets), the higher the level of outsourcing. In other words, the performance of network nanocorporations will decrease if the core company outsources functions with a high level of specificity of its assets.

2. The lower the specificity level of assets in the network, the higher the relationship between outsourcing and the overall performance of the network. This is consistent with the general conclusion of the theory of Transaction Costs Economics (TCE) that the more the assets in the supply chain are "tuned" to interact with a specific client (supplier), the less likely it is that the company will outsource this type of activity.

3. The higher the level of formal control in the network based on contracts (franchises and others), the more effective is the relationship between outsourcing of the focal company and the effectiveness of the network.

4. The more rationalized and standardized the activities of the focal company and, therefore, it has created effective «box solutions» for scaling, the higher the growth rate of the nanocorporation network. Kaizen methods are especially effective for standardizing operations and increasing the efficiency of processes in a focal firm.

5. The less physical assets and the operating component the focal company has, the more it concentrates on its core competency in managing the network and its development and, therefore, the more efficient the overall network performance.

6. The more centralized the decision-making on outsourcing in the focal company is, the faster decisions are made on outsourcing and the stronger the connection between outsourcing and network performance.

3. Research Methodology

Three companies, introducing a network nanocorporation model and representing small and medium-sized businesses (SMEs) from various regions of Kazakhstan were taken for the study. These are Karavay KZ LLP (Shymkent), Bakhtiyar Avto LLP (Kyzylorda) and Domino Trade LLP from Aktau (Domino Home &Horeca network). Some aspects of the nanocorporation model and the experience of its application have been considered previously (Dzhalkibaev & Musapirov, 2018; Dzhalkibaev & Musapirov, 2019)

As known, an adequate research methodology should be a reflection of the properties of the studied object. Considering the nature of the study (microlevel) and the emphasis on the managerial aspect, which is associated with the coordination of interests and motivation of people's actions, qualitative research methods were mainly used: case method, in-depth interviews, observation, comparison and others.

The case method is known in the scientific community and is considered effective in the study of poorly studied or new phenomena (Pettigrew, 1987). Such phenomena include the network form of business organization at the stage of origin and formation. The essence of the study is "rigorous studies of one case, which leads researchers to understand the new theoretical interdependencies, and also makes them, question existing ones" (Dyer&Wilkins, 1991).

An individual in-depth (focused) interview is an important research method. The relevance and scientific value of a research tool is sufficiently substantiated in the literature. (Belanovsky, 2001). For research it is important that the interviewed leaders and top managers are those people who directly innovate their organizations. This allows to identify important subjective experiences and experiences that arise during the implementation of innovations.

The key elements of the stages of implementing managerial innovations have been previously identified and analyzed. Based on this analysis, an extensive questionnaire was developed for an in-depth interview (85 questions in three blocks), which covers all the necessary research questions.

A focused interview with leaders, owners, and managers of the enterprises was conducted based on the questionnaire. To achieve the validity of the study, the data was considered from both documentary analysis and external observation, as well as self-esteem of managers and owners of enterprises.

Formality of the obtained empirical data is achieved by collecting and analyzing data in a standardized way. The selection was made on the basis of the following criteria: companies that actually introduced managerial innovations had a pronounced entrepreneurial character and were at the stage of formation and rapid growth of the business.

Observation and analysis of the development processes of each company was carried out from 6 months to two years (longitude cases). The authors regularly recorded and systematized the main changes in the companies. Regular measurements of changes, analysis of problems of business growth and scaling are supposed to be carried out over the course of a number of years every 6-8 months.

The longitude character of the research allows to determine the causes of subsequent effects not limited to the identification of correlation dependencies; for example, periodic individual interviews have already shown that the internal locus of control (the entrepreneur's orientation toward himself and his own forces, rather than external factors or cases) precedes the scaling of the business and is one of the important reasons for the entrepreneurial orientation of companies.

The study focuses on the launch of the process, means, on the *emergence* of a new form of business (entrepreneurial network). The selection of research objects was carried out from new, emerging forms of activity of individuals and organizations: the main stages of changes are monitored - both the entrepreneurs themselves and their environment and organizational context. The importance of studying the processes of the emergence of new forms of business was emphasized Davidsson and Wahlund (Davidsson, 2005).

The problem of generalizing and generalizing the findings to a wider set of phenomena has always been debatable in the applianceof the case study method. Therefore, the authors sought to find a reasonable balance between the detailed descriptive features of the practice of firms and the general development trends of small and medium-sized businesses. This allows to rise above individual cases and identify some stages in the development of network forms of entrepreneurial activity.

Cases were described on the basis of archival data for the period from 2016 to 2018, as well as more than 30 interviews with representatives of the business network, their suppliers, as well as experts conducted from April 2017 to July 2019. The sources, internal and external to the companies, were balanced.

Despite the specificity of the cases that have been taken under consideration, the rationale for the selection of research objects, the sequence of development and the relationship of assumptions (hypotheses), data collection methods are available and understandable to other researchers who decide to repeat the results and re-analyze the cases and materials.

4. Results and discussion

Domino Trade LLP (Domino Home & Horeca network, Aktau) is engaged in retail and wholesale supply of tableware for home and restaurants in Kazakhstan. The owner and head of the franchise chain of stores is Davletov Zhalgas.

The family's business began in February 2014 in Aktau with the spouses from the opening of the "Everything for Home" retail store (the second in 2015). The turnover of two stores reached 6-9 million tenge per month, more than 20 sellers worked, the total sales area was 980 m2. The stores presented the widest range of dishes and textiles for the home of the national Evimnetwork (Turkish franchise).

The sharp devaluation of the national currency against the US dollar in August 2015 led to a crisis of the family business (growth of tenge from 180 to 270, then to 350 tenge per US dollar). All contracts for the supplied dishes, souvenirs, textiles were concluded in dollars, and goods were sold in tenge. The debt for the received, but not sold dishes of the Evim network has grown significantly and was not covered by the goods available.

As a result of anti-crisis measures, improvement of processes and flows by kaizen methods, ABC analysis, application of the Pareto principle (according to which 20% of products bring 80% of sales), the range was radically reduced by 23 product groups (including furniture, children's goods, etc.), various types of losses in the chain "warehouse-store-buyer" are reduced. The retail space and the number of sellers serving customers were significantly reduced (on average by 50%). This all made it possible to raise the level of sales conversion from 6.2% to 30%, and to reduce several times the sales area and staff.

Two important strategic decisions were made:

(1) The B2B sector is defined as the main niche: it is cafes, restaurants, hotels, guest houses, supermarkets, companies specializing in catering, etc. The study of their requests allowed us to establish the optimal list and volume of goods that must be ordered from wholesale suppliers.

(2) Concentration of forces on key competencies - the creation and management of a corporate network, the saturation of its commodity supplies; to outsource the functions of storage, delivery and, most importantly, the sale of goods, that is, refuse to own stores.

To create a franchise, a "boxed solution" for the function of selling goods was prepared (packaged). This is a store or warehouse store with an area of 40-70 m2 with an optimal set of products: tableware, for cooking, knives and kitchen accessories, tables and chairs, covers for restaurants, etc. On the basis of the franchise agreement, each member of the network was given a set of benefits for managing the store (including operating standards), as well as providing training, internships and testing of personnel, marketing support.

As of December 31, 2018, over 1.5 years, on a franchise basis, 22 stores of the accepted box format were opened in all major cities of Kazakhstan. This made it possible to significantly increase sales, receive more and more privileges and discounts from wholesale suppliers, and set lower prices and shorter delivery times than competitors.

On the basis of a network of 22 stores and regional warehouse stores, it is planned to open an online store in 2019 with delivery of day-to-day orders (ideally in one hour). The combination of the best price in the region and fast delivery allows the network to become the future leader in e-commerce

In 2007-2016, **Karavay KZ LLP** from Shymkent has been developing in the middle price segment as a network of dining rooms with home cooking, focused on quality (product differentiation strategy).

As the business grew, it became increasingly difficult to manage a larger company. A leadership crisis arose: further development of the network required the abandonment of manual control "according to the situation" (ad hoc) and the introduction of regular management tools. There was a need to implement effective operating systems. An understanding has come that competition is carried out not only in terms of price, assortment and quality of dishes, but also in internal operating systems.

Changes in the company were carried out in two stages:
- from 2015 to August 2017, improvements were made to operating systems and working standards, automation and informatization, optimization of business processes in order to reduce losses and control costs; standard operating procedures (SOPs) were developed and implemented - maintenance, cleaning the room, table, washing dishes, behavior in different situations.

- Since September 2017, the company has completely switched to work in the format of nanocorporation and the implementation of a new cost leadership strategy for it. The average check was reduced from 1200 tenge to 1000 tenge, then 800 tenge and 500 tenge.

As of January 2019, Karavay.KZ LLP had 9 points of sale with a total number of 50 people: seven points work in a new format (number of employees 2 people per point), 2 points, including a food preparation workshop, worked in a traditional format (average check - 1200 tenge).

The company has standardized all work processes, the range of dishes has been reduced from 280 to 45-50 items, including 14 items - the main popular dishes. Outsourcing has translated the production of a significant part of the types of dishes (manti, dumplings, etc.) and ingredients, as well as the delivery of dishes - both for their points and for B2B customers. At the core (brand) company they left distribution of products, packaging and packaging of dishes (in the central workshop), planning and marketing (search and attraction of B2B category customers).

The goal for the coming year is to reach 500 million tenge in the revenue of all types of products and open 15 more outlets in Kazakhstan operating in a new format. The emphasis is on work in the B2B sector (schools, hospitals, factories, construction sites, etc.).

The third company - Bakhtiyar-Avto LLP from Kyzylorda (head -Kudaibergenov Bakhtiyar) provides services for installing gas equipment on cars and selling gas-cylinder equipment (GCE) for consumers.

Since 2016, the company has been an official representative for the sale of components of GCE in the South Kazakhstan region and Astana. The total number of employees is 18 people, including 10 people - installers of gas equipment.

At the moment, the company operates in the market of three large cities using the B2C system (services for installing GCE for cars of individuals and legal entities as final consumers) and buyers of B2B equipment (commercial organizations, GCE installers).

The company has completely revised and improved work operations and updated standards. As a result, it was possible to maximumly reduce the time for conversion of the car from 8 hours to 1.5 hours (in the absence of any problems in the car itself). This is the best result in this segment in Kazakhstan.

The company carries out direct deliveries of gas equipment from manufacturing plants in Italy, Poland and Belarus, as well as through KazTechnoGas LLP (Uralsk). Fundamental changes began in the company with the introduction of a continuous process improvement system (kaizen) at the enterprise and the creation of an effective workplace using the well-known 5S methodology.

The product range was sharply reduced in sales: at the first stage, out of 250 components, about 100 items were left; the task is to switch to the sale of only the most popular goods and reduce the number of products sold to the 15 most popular items.

The company's events in September-December 2017 included staff optimization (reducing staff from 50 to 30, then to 18) and halving overhead costs. As a result, the overall efficiency of the customer service system increased by 5 times, the installation time of GCE on one car was reduced by 7 times

At the end of 2018, compared with 2017, revenues increased several times. The goal was to reach a turnover of 1 billion tenge by the end of the year, actively replicating successful business by entering the markets of Almaty, Astana, Pavlodar and other cities.

Summarizing the three cases, it can be said that the process of deriving the function of selling goods outside the company for outsourcing (externalization) has five stages recorded in the transactions of three companies (table 1).

Table 1. The generalized process of externalization of the function of selling goods (services)

Stage I	Stage II	Stage III	Stage IV	Stage V
Basicpremise	Incubation period	Conclusion of a function to outsourcing or purchasing a service in the market	Collaboration building	Network integration
Process description				
Making strategic decisions on key competencies and outsourcing of functions (work)	Provision of in-house changes and packaging of the optimal "boxed solution" for replication	Conclusion of function outside or purchase in the market	Redefining and clarifying responsibilities, debugging interaction, understanding cooperation of interests	Network collaboration based on contracts, internal communications, informal interaction
Goal				
Finding a niche segment and core competence of the company	Business scaling, rapid growth in the level of sales of goods (services)	Finding an effective seller of goods (services) in the region, including among employees	Establishment of effective cooperation, achievement of synergy of efforts	Strengthening and deepening cooperation, preventing problems
Formal Milestones				
Strategic decisions taken	BoxSolutionModel	Franchise agreement and contract for the supply of goods (provision of services)	Model of contract prices, rights and obligations	Model of contract prices, rights and obligations

Source: compiled by the authors

In terms of management, the implementation of the concept of nanocorporation has enabled integrator firms to abandon the accumulation and control of tangible assets. It focused on strategic and marketing planning, corporate management and brand promotion. This allowed to reduce the number of employees to 3-7 people. Intra-firm changes and the creation of a "boxsolution" made it possible to replicate the business and create an extensive network (table 2).

Table 2. Summary of three network enterprises

	Firms using the nanocorporation model	Industry and location of the core (focal) company	The number of agents in the network	Numberoffranchisingagreements	Joint (cross) ownership of assets	Number of full-time employees of the central (focal) company
1	LLP Karavay KZ	publiccatering, Shymkent	9	7	2	6
2	LLP "DominoTrade"	wholesale and retail trade Aktau, Almaty	23	22	1	3
3	Bakhtiyar-Avto LLP	maintenanceservices Kyzylorda	6	6	0	2

Source: as of March 31, 2019, compiled by the authors

The survey of change leaders showed that achieving operational efficiency and continuous improvement of operations is not an easy task of stage 1 changes. Tough decisions must be made to change the organizational structure, internal and external communications, standardize operating procedures, and take measures to involve staff (kaizen).

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At the second stage, it is understood that although optimization and operational efficiency improve the company's performance, they cannot provide a long-term competitive advantage (other companies have also implemented best practices). One operational efficiency is not enough - it is important to have a unique strategy,do something different than others. The business model of nanocorporation has given entrepreneurs such a perspective.

For Kazakhstani companies, the problem of business growth is compounded by the fact that they cannot fully utilize the economies of scale due to the small size of the local market compared to, for example, China, Russia or Uzbekistan (Islamgaleyev, 2018; Labunska et al, 2019; Pukala, 2016). In the vast territory of Kazakhstan with an area of 2.7 million km2, only 18 million people live. Population and markets are localized in several large cities, roads and railways are stretched and imperfect. After Kazakhstan joined the World Trade Organization and with the free flow of goods, capital and labor within the framework of a single Eurasian Economic Union, competition only intensified.

In addition to achieving operational efficiency and the strategic selection of a business model, entrepreneurs learn to identify and overcome considerable obstacles in the mental sphere: expand their consciousness and planning horizon, set ambitious and elusive goals to go beyond the national market. In order to develop the studied networks, the task is to penetrate the global market. So, in the coming years, the Domino home &horeca network is planned to enter the markets of Russia, Uzbekistan and China.

Making a general review of company research, it can be said that the following results were obtained:

1. The lower the level of specificity of assets, as the standard "all for home" stores in Domino Trade LLP, the higher the level of outsourcing (all stores and the function of selling goods are transferred to network participants). And vice versa, due to the fact that the effectiveness of the network nanocorporation will suffer, the core company Karavay.KZ LLP did not outsource its specific asset - the central department for the preparation and packaging of dishes.

2. The rapid way has been shown for the growth and scaling of small and medium-sized businesses, if an optimal "boxed solution" has been prepared for its replication, as well as entrepreneurial intentions focused on significant growth have been formed. Another way for small businesses to compete is to stay on the level of survival or simply break up. This is consistent with the position of organizational ecology that the selection mechanism in a competitive environment is more powerful than simply adapting to environmental changes (Radaev, 2005).

3. The viability of the network model of nanocorporation was tested and the problems that arise at each stage of its implementation in the face of low solvency of the population, a slowdown in economic growth and a significant degree of uncertainty (including the unstable rate of the national currency) are revealed.

4. A small core center (focal firm) can effectively manage network nanocorporation by focusing on core competencies and outsourcing most of the traditional functions along with physical assets and human resources.

5. A franchise network of nanocorporations allows to rapidly scale a business if the actor company has developed and successfully applied standard operating procedures and models, marketing strategies, and has sufficient entrepreneurial experience and level. Effective "boxed" solutions and formal control based on a franchise agreement in all three nanocorporations have shown its effectiveness for network growth.

6. The rapid growth of small and medium-sized businesses, which have an entrepreneurial character, positively correlates with both centralized decision-making on outsourcing units and the personal transformation

of the leader and his team; the latter is associated with the transfer of the intentions and visions of actors from a local to a global focus (perspective), with the development and setting of ambitious, elusive goals.

7. Small companies can successfully compete with large businesses through the creation and development of networked entities.

What are the obstacles and limitations to the implementation and dissemination of network nanocorporations? Firstly, unlike bureaucratic, team relations within the company or formal contractual relations between them, inter-company coordination is characterized mainly by an organic or informal social system based on the exchange of social products. Trust, common cultural and age affiliation, prestige, social rootedness of the practice, control through business standards, culture, moral obligations, etc. are of great importance. This requires the development of social skills from the leader and team of the core company, taking measures to strengthen trust and informal relationships.

Secondly, the regional external environment in which network participants operate can influence the internal environment of these small enterprises. They can actually they can merge with local interests and specifics. It is necessary to develop systems of diverse network communications, modern control and audit using appropriate information technologies.

Thirdly, any cost-effectiveness and structural compliance alone do not guarantee success. Against innovators, the principle of "liability of newness", formulated by A. Stinchcombe, dates back to the mid-1960s. Usually, the frequency of creating new forms of business is initially low, although the market niche is still relatively free.

Conclusions

The fluctuating needs of customers are becoming more personalized and can be satisfied only by those organizations that themselves are constantly changing. According to KPMG experts (Baylis, KPMG, 2013: 7), in the future, nanocorporations and pop-ups will become the dominant organizational structure and in fact the only option to remain competitive. Large bureaucratic "modern organizations ... will have to evolve, otherwise they will disappear." They are too expensive, too difficult to change, and unable to cope with the growing needs of consumers. "

The development of the companies that have been reviewed is based on the cost leadership strategy, which allows the competitive advantages of network structures operating in conditions of limited solvent demand to be most strongly manifested.

Based on network coordination and analytics, it is possible in the future to develop a holistic ecosystem (such as the Chinese Alibaba), which within itself coordinates the actions of many players. This ecosystem allows network members to be more competitive and customer-oriented, significantly reducing their costs compared to traditional firms.

Thus, a small company of an entrepreneurial nature can become national in a relatively short period by attracting the resources of network participants to ensure better quality and price. On the basis of such cases, collected empirical material sufficient to theoretically generalize the experience of managing network nanocorporation and study its evolution. The study is built as longitude and authors will continue to track the further development of these network entities with a frequency of 6-8 months.

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CONCEPTUAL APPROACHES TO THE PUBLIC DEBT MANAGEMENT AND ITS IMPACT ON FINANCIAL STABILITY

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Abstract. Management and regulation of public debt for many years is an urgent problem of the functioning of the financial system of the state, as it is a component of the financial systems of the vast majority of countries. In this regard, the priorities and areas of the debt policy, in the framework of which the formation and servicing of public debt are gaining particular importance. Public debt plays a significant and multifaceted role in the macroeconomic system of any state, since relations regarding the formation, servicing and repayment of public debt have a significant impact on the state of public finances, monetary circulation, the investment climate, the structure of consumption and the development of international cooperation between states. For the Republic of Kazakhstan, the problem of improving the public debt management system and its impact on financial stability is relevant because its solution requires research and the search for radically new mechanisms in the context of the transformation of the economic system into a market one, which is associated with increased economic risk.The purpose of the study is to identify the main trends in the system of managing state external borrowings of the Republic of Kazakhstan, to analyze theoretical studies of foreign and domestic authors, as well as solutions to formulate recommendations for improving the efficiency of external debt management and its impact on the financial stability of Kazakhstan. The theoretical and methodological basis of the study was the development of domestic and foreign economists, laws and regulations governing economic and social processes in this area. The information base of the study was the work of domestic and foreign scientists and specialists in the field of public debt, official statistical and informational materials of the Ministry of Finance of the Republic of Kazakhstan, data of the National Bank of the Republic of Kazakhstan, data of the Ministry of National Economy of the Republic of Kazakhstan, statistical collections and Internet resources.

Keywords: interest rates; investment climate; financial market; public debt; management; financial stability; external debt; domestic debt; budget deficit; debt burden; stagnation; gross external debt (GED); budget.

1. Introduction

An important element of the system of functioning of international economic relations is external debt, which has a huge impact on the country's economy. Foreign loans, on the one hand, contribute to the expansion of international trade, the introduction of new technologies and industries, and, on the other hand, exacerbate internal contradictions and increase the risk of a financial crisis. In this regard, external debt management is one of the priority tasks of the state. As the experience of foreign countries shows, an effective system of external debt management can ensure the prompt attraction of the necessary amount of borrowing to meet the financial needs of the state, save significant financial resources by optimizing the debt structure and debt servicing schedules, and minimize the risks of borrowing in foreign currency.

Accelerating the processes of globalization and integration of global financial markets has led, on the one hand, to increased access to borrowed resources and an increase in international lending, and on the other, to an increase in the negative effects of debt crises, often the state debt crisis is an important component of wider financial shocks (Zeibote et al. 2019; Sasongko et al., 2019; Masood et al., 2019; Girdzijauskaite et al., 2019; Burhanudin et al., 2017; Strýčková, 2017).

Today, public debt management is one of the key factors of macroeconomic stability in the country, since the fiscal capacity of Kazakhstan, the state of its foreign exchange reserves, and, therefore, the stability of the national currency, the level of interest rates, the investment climate, the nature of behavior depend on the nature of solving the debt problem.

Attracting and using external loans is one of the most important areas of monetary and foreign exchange policy of the state. Considering the importance of external borrowing for the country's economy, one should take into account both their positive and negative impact. On the one hand, foreign borrowing at a certain stage contributes to the development of the country's economy, the expansion of international trade, the introduction of new technologies and industries, and is a non-inflationary source of financing the budget deficit. On the other hand, upon maturity of external debt repayment, the state's investment opportunities are limited due to the need to accumulate resources for debt repayment.

When analyzing indicators of external debt, it is customary to use a system of indicators of the country's external debt, developed by the International Monetary Fund in conjunction with other international organizations in the document "External Debt Statistics: A Guide for Compilers and Users" (External debts tatistics: guide for compilers and users 2003). An important indicator in the system of indicators of the country's external debt is the size of the external debt (The World Bank Indicator External debt).

Considering public debt in the financial system, it should be noted the main theoretical approaches to the formation of the definition of this financial and legal category, which have developed both in foreign and in domestic science.

In accordance with the Budget Code of the Republic of Kazakhstan, the management of public debt and contingent liabilities (debt guaranteed by the state and debt under state guarantees) includes:
1) an annual assessment of the state and forecast for the upcoming planning period of state and state-guaranteed borrowing and debt, debt on state guarantees, with the definition of indicators in it, in accordance with which the amounts of repayment and servicing, the limits of government debt and debt of local executive bodies, the provision of state guarantees and sureties of the state;

2) approval in the law on the republican budget of the limit of government debt, the limits for the provision of state guarantees;
3) determination of volumes, forms and conditions of borrowing by the Government of the Republic of Kazakhstan, volumes of repayment and servicing of government debt;
4) the implementation of registration of loans, monitoring the receipt, use of loans, repayment and servicing of debt;
5) preparation and implementation of measures to optimize the structure of debt and its servicing, including the early repayment of debt, the purchase and sale by the issuer of government equity securities on the organized securities market, debt restructuring, debt refinancing, borrowing and debt risk management;
6) debt risk management, which includes their identification, identification, assessment and minimization using methods of regulation of procedures and operations, compliance with established limits and requirements, diversification of instruments and markets, the use of various derivative financial instruments (options, swaps, forward, futures and other transactions used in the market for risk management purposes) (Budget Code of the Republic of Kazakhstan dated December 2008).

The analysis of public debt as a financial and legal category shows that there are different approaches to its definition. At the same time, common features can be distinguished in different approaches to the definition of public debt, among which:
- the will of the authorities to attract borrowed funds;
- certain conditions for attracting borrowed funds;
- regulation of budget legislation.

Summarizing the foregoing, the author proposed the following definition, characterizing public debt, as the relationship of financial and legal norms designed to ensure regulation of financial relations in which the state acts as a debtor in relation to other subjects of these relations. Therefore, public debt should be considered as a source of financing budget deficits and as a form of its spending.

2. Literature review

According to V.M. Fedosova, public debt represents the amount of debt on issued and outstanding domestic government loans, as well as the country's financial obligations to foreign creditors on a certain date (Fedosova 1991).

B.G. Boldyreva considers public debt in the same way as the amount of issued, but outstanding government loans with accrued interest, which must be paid by a certain date or for a certain period of time (Boldyreva 1990).

A similar understanding of public debt, but without specifying a time period, is laid by N.F. Samsonov, N.P. Barannikova, N.I. Strokova, defining government debt as the sum of debts on issued but outstanding debt obligations of the state, including interest accrued on them (Samsonov et al. 1998).

A deeper content of this category is presented by O.D. Khaikhadayeva, who considers it as a result of credit relations arising in connection with the movement of temporarily free funds from the national, private sector or from abroad to the state budget based on the principles of borrowing (Khaikhadayev 2000).

According I.V. Rukavishnikova, public debt is a set of obligations arising from state or municipal borrowings, guarantees for third-party obligations, other obligations in accordance with the types of debt obligations established by budget legislation (Rukavishnikova 2009).

In some foreign countries, for example, Belgium, Germany, Sweden, etc., in the constitutions of states financial

issues are singled out as an independent section, which indicates the importance and strategicity of relations in the field of public debt, since the legal regulation of the financial activities of the state in this area carried out at the constitutional level (Kozyrin 2002; Cayón & Perilla, 2018; Kliestik et al., 2018).

E.A. Sokolov in his scientific publications lays the causal relationship between public debt and public credit as the basis for the content of public debt, noting the interdependence and interdependence of state credit, state loans and state domestic debt (Sokolov 2006).

3. Methodology

Considering the conceptual approaches to public debt management, it should be noted that the concept of forming and using the funds of the National Fund of the Republic of Kazakhstan was developed in accordance with the Message of the President of the Republic of Kazakhstan to the people of the country dated November 30, 2015 "Kazakhstan in a new global reality: growth, reform, development", where Priorities for the further development of the state were identified in the new global reality (Message from the President of the Republic of Kazakhstan to the people of the country).

The definition of new approaches to the formation and use of the funds of the National Fund of the Republic of Kazakhstan is a logical continuation of the ongoing policy of saving oil revenues for future generations of the country and reducing the dependence of the republican budget on changes in the world commodity market.

In Kazakhstan, the foreign loan management policy is linked to the Concept of the formation and use of funds of the National Fund, where the country's total debt is limited by the size of the fund's foreign currency assets. This ratio, as indicated in the document, was prescribed to maintain the financial stability of the country (Decree of the President of the Republic of Kazakhstan "On the Concept of the formation and use of funds of the National Fund of the Republic of Kazakhstan").

At the end of 2017, according to the report of the Accounts Committee on the execution of the republican budget, this indicator approached the limit value: the country's total debt amounted to 55.5 billion dollars, or 96.2% of all foreign currency assets of the National Fund - 57.7 billion dollars. And its approach to 100%, according to committee analysts, poses significant risks of the country's financial instability (Table 1) (Data of the Ministry of Finance of the Republic of Kazakhstan for 2014-2018).

Table 1.International reserves and assets of the National Fund of the Republic of Kazakhstan for the period from 2008-2018

Year	Net international reserves			Assets of the National Fund of the Republic of Kazakhstan		
	volume, million dollars	change to the previous month, %	change by the beginning of the year, %	volume, million dollars	change to the previous month, %	change by the beginning of the year, %
2008	18 236	- 8,10	- 8,10	27 964	1,74	1,74
2009	25 715	14,13	14,13	24 619	1,03	1,03
2010	30 611	10,46	10,46	31 426	1,44	1,44
2011	33 136	15,20	15,20	45 511	4,16	4,16
2012	26 415	- 4,76	- 4,76	58 480	0,95	0,95
2013	23 974	- 0,81	- 0,81	71 142	0,50	0,50
2014	28 193	- 0,24	- 0,24	71 751	- 1,96	- 1,96
2015	25 961	- 3,76	- 3,76	63 647	0,40	0,40
2016	28 866	- 0,45	- 0,45	62 871	2,70	2,70
2017	30 824	1,12	1,12	59 350	1,74	1,74
2018	30 090	- 1,15	- 1,15	58 246	0,45	0,45

Source: compiled by the author based on the source: Data of the Ministry of Finance of the Republic of Kazakhstan for 2014-2018

According to the Ministry of Finance of the Republic of Kazakhstan, as of January 1, 2019, state and state-guaranteed debt amounted to slightly more than 16 trillion tenge ($ 41.8 billion), including public debt - 15.39 trillion tenge ($ 40 billion). Compared to 2017, it increased by 14.7% or by 2.06 trillion tenge, but in dollars decreased by 328.3 million (Table 2) (Data of the Ministry of Finance of the Republic of Kazakhstan for 2014-2018).

Table 2.Indicators of state and state guaranteed debt and debt burden for 2014-2018

Indicator	2014	2015	2016	2017	2018
Domesticdebt	4252	4755	6824	8885	9601
External debt	1511	4542	4896	5005	6252
Government debt as % of GDP	14,3	22,1	24,3	25,4	26,2
Debt servicing costs to the republican budget revenues (excluding transfers from the NF), %	15,0	16,4	18,8	16,2	17,3
Debt servicing costs to the republican budget revenues, %	10,1	9,8	11,8	8,8	12,2

Source: compiled by the author based on the source: Data of the Ministry of Finance of the Republic of Kazakhstan for 2014-2018.

Despite the fact that the ratio of public debt to GDP remains within safe limits - 26.2% (in 2020 it should not exceed 27%), its growth is 11.6 percentage points higher than in 2014:
- in 2014, it amounted to 14.6% of GDP;
- in 2015 - 22.1%;
- in 2016 - 24.3%;
- in 2017 - 25.4%.

The Accounts Committee notes that if this was justified during the stagnation of the national economy and the global crisis, now it is not. The country's external debts in the structure of state and state-guaranteed debt

amounted to 39%, which is higher than the level of 2017 (35.8%), internal debt decreased to 59.8% (63.3%) - an increase of $ 1.2 billion (from 15.1 billion to 16.3 billion).

4. Results

To form a coherent state political activity on external and internal loans, in our opinion, economic and mathematical tools should be applied.

Structuring and systematizing economic and statistical information using the methods of statistical analysis, we will study the interaction of indicators of the size of the domestic debt with the external debt of the country, by constructing a multiple regression model based on the statistical data given in table 2.

Based on the correlation field, one can hypothesize (for the general population) that the relationship between all possible values of X and Y is linear.

The linear regression equation has the form: $y = b\,x + a$
The estimated regression equation (constructed from sample data) will have the form:
$y = bx + a + \varepsilon$
whereε – observed values (estimates) of errorsε_i, $a$and$b$, respectively, estimates of the parameters α and β of the regression model to be found.
Here,ε - random error (deviation, indignation).
To estimate the parameters α and β - use the least squares method.
The least squares method gives the best (consistent, effective and unbiased) estimates of the parameters of the regression equation. But only if certain prerequisites are fulfilled regarding the random term *(ε)* and the independent variable *(x)*.
Formally, the least squares methodtest can be written as follows:

$$S = \sum (y_i - y^*_i)^2 \to min$$

To calculate the regression parameters, we construct a calculation table (Table 3)

Table 3.The calculation table of the parameters of the equation

x	y	x^2	y^2	x • y
1511	4252	2283121	18079504	6424772
4542	4755	20629764	22610025	21597210
4896	6824	23970816	46566976	33410304
5005	8885	25050025	78943225	44469425
6252	9601	39087504	92179201	60025452
22206	34317	111021230	258378931	165927163

Source: compiled by the authors

The system of normal equations.

$$\begin{cases} a{\cdot}n + b{\cdot}\sum x = \sum y \\ a{\cdot}\sum x + b{\cdot}\sum x^2 = \sum y{\cdot}x \end{cases}$$

For our data, the system of equations has the form

$$\begin{cases} 5{\cdot}a + 22206{\cdot}b = 34317 \\ 22206{\cdot}a + 111021230{\cdot}b = 165927163 \end{cases}$$

Solving the system by the method of algebraic addition, we obtain the empirical regression coefficients:

$a = 2021{,}5733$, $b = 1{,}0902$

Regression equation (empirical regression equation):

$y = 1{,}0902x + 2021{,}5733$

The empirical regression coefficients a and b are only estimates of the theoretical coefficients βi, and the equation itself reflects only the general tendency in the behavior of the variables in question.

Regression equation parameters:
Standard deviation:

$$S(x) = \sqrt{S^2(x)} = \sqrt{2479988{,}56} = 1574{,}798$$

$$S(y) = \sqrt{S^2(y)} = \sqrt{4569526{,}64} = 2137{,}645$$

Coefficient of determination:
The square of the (multiple) correlation coefficient is called the coefficient of determination, which shows the proportion of variation of the productive attribute, explained by the variation of the factor attribute.

Most often, giving an interpretation of the coefficient of determination, it is expressed as a percentage.

$$R^2 = 0{,}803^2 = 0{,}6451$$

That is, in 64.51% of cases, changes in x lead to a change in y. In other words, the accuracy of the selection of the regression equation is average. The remaining 35.49% of the change in Y is explained by factors not taken into account in the model (as well as specification errors).

To assess the quality of the regression parameters, we construct a calculation table (table 4).

Table4.Calculation table for assessing the quality of regression parameters

x	y	y(x)	$(y_i - y_{cp})^2$	$(y - y(x))^2$	$(x_i - x_{cp})^2$
1511	4252	3668,876	6819409,96	340033,73	8586072,04
4542	4755	6973,293	4445350,56	4920823,17	10160,64
4896	6824	7359,226	1552,36	286466,952	206843,04
5005	8885	7478,059	4086866,56	1979484,041	317870,44
6252	9601	8837,547	7494453,76	582861,149	3278996,64
22206	34317	34317	22847633,2	8109669,042	12399942,8

Source: compiled by the authors

Hypothesis testing regarding the coefficients of the linear regression equation:
1. *t*-statistics. Student'scriterion.
Using the least squares method, we obtained only estimates of the parameters of the regression equation that are characteristic of a particular statistical observation (a specific set of *x* and *y* values).

To assess the statistical significance of the regression and correlation coefficients, Student *t*-test and confidence intervals of each of the indicators are calculated. The hypothesis H_0 about the random nature of indicators is put forward, i.e. their insignificant difference from zero.

If the actual value of the *t*-test is less than the tabular (modulo), then there is no reason to reject the main hypothesis, i.e. a parameter or statistical characteristic in the general population is not significantly different from zero at a significance level of *α*.

T_{crit} (*n-m-1;α/2*) = (3;0,025) = 3,182

$$t_b = \frac{b}{S_b}$$

$$t_b = \frac{1,09}{0,467} = 2,33$$

Since 2.33 < 3.182, the statistical significance of the regression coefficient *b* is not confirmed (we accept the hypothesis that this coefficient is equal to zero). This means that in this case, the coefficient *b* can be neglected.

$$t_a = \frac{a}{S_a}$$

$$t_a = \frac{2021,573}{2200,134} = 0,92$$

Since 0.92 <3.182, the statistical significance of the regression coefficient *a* is not confirmed (we accept the hypothesis that this coefficient is zero). This means that in this case, the coefficient *a* can be neglected.

Confidence interval for the coefficients of the regression equation:
We determine the confidence intervals of the regression coefficients, which with a reliability of 95% will be as follows:

$(b - t_{crit} S_b; b + t_{crit} S_b)$

$(1{,}09 - 3{,}182*0{,}467; 1{,}09 + 3{,}182*0{,}467)$

$(-0{,}395; 2{,}576)$

With a probability of 95%, it can be argued that the value of this parameter will lie in the found interval. Since the point 0 (zero) lies inside the confidence interval, the interval estimate of the coefficient b is statistically insignificant.

$(a - t_{crit} S_a; a + t_{crit} S_a)$

$(2021{,}573 - 3{,}182*2200{,}134; 2021{,}573 + 3{,}182*2200{,}134)$

$(-4979{,}253; 9022{,}399)$

With a probability of 95%, it can be argued that the value of this parameter will lie in the found interval.

Since the point 0 (zero) lies inside the confidence interval, the interval estimate of the coefficient a is statistically insignificant.

2. *F*-statistics. Fisher criterion.

The determination coefficient R^2 is used to verify the significance of the linear regression equation as a whole.

The significance of the regression model is checked using the Fisher *F*-test, the calculated value of which is found as the ratio of the variance of the initial series of observations of the studied indicator and the unbiased estimate of the variance of the residual sequence for this model.

If the calculated value with $k_1 = (m)$ and $k_2 = (n-m-1)$ degrees of freedom is greater than the table value for a given level of significance, then the model is considered significant, where m is the number of factors in the model.

The statistical significance of paired linear regression is estimated according to the following algorithm:
1) The null hypothesis is put forward that the equation as a whole is statistically insignificant: H_0: $R^2 = 0$ at the significance level α.
2) Next, determine the actual value of the *F*-criterion:

$$F = \frac{R^2}{1-R^2} \cdot \frac{n-m-1}{m} = \frac{0{,}6451}{1-0{,}6451} \cdot \frac{5-1-1}{1} = 5{,}45$$

The table value is determined from the Fisher distribution tables for a given significance level, taking into account that the number of degrees of freedom for the total sum of squares (greater variance) is 1 and the number of degrees of freedom of the residual sum of squares (lesser variance) for linear regression is $n - 2$.

F_{tabl} is the maximum possible value of the criterion under the influence of random factors at given degrees of freedom and significance level α. The significance level α is the probability of rejecting the correct hypothesis, provided that it is true. Typically, α is assumed to be 0.05 or 0.01.

If the actual value of the *F*-criterion is less than the tabular one, then they say that there is no reason to reject the null hypothesis.

Otherwise, the null hypothesis is rejected and with probability *(1 - α)* an alternative hypothesis is accepted about the statistical significance of the equation as a whole.

The table value of the criterion with degrees of freedom $k_1 = 1$ and $k_2 = 3$, $F_{table} = 10.1$.

Since the actual value is F $<F_{table}$, the determination coefficient is not statistically significant (the found estimate of the regression equation is not statistically reliable).

As a result of the simulation, the dependence of *Y* on *X* was studied. At the specification stage, a pair linear regression was chosen. Its parameters are estimated by the least squares method. The statistical significance of the equation was verified using the coefficient of determination and the Fisher test.

It was found that in the studied situation 64.51% of the total variability of *Y* is explained by a change in *X*. It was also established that the model parameters are statistically weakly expressed. An economic interpretation of the model parameters is possible - an increase of *X* by 1 unit leads to an increase in *Y* by an average of 1.09 units. The obtained estimates of the regression equation make it possible to use it to predict selected economic parameters.

The cost of servicing and paying off government debt in 2018 increased to 1.07 trillion tenge, or by more than 25% compared to 2017. The Accounts Committee has repeatedly noted that the reason for the increase in the external debt of the government is the inefficient planning and development of borrowed funds, insufficient elaboration of risks and the impact on the country's economy of external and internal borrowing instruments.

The level of the debt burden on the budget (the ratio of the costs of servicing and paying off government debt to the republican budget revenues - autors) is within the 15 percent limit. However, this indicator increased from 8.8% in 2017 to 12.2% in 2018, that is, every eighth tenge of income goes to pay debt. So, excluding transfers from the National Fund, the debt level is 17.3% - an excess of 2.3 percentage points (every sixth tenge).

In general, according to the results of 2018, the gross external debt of Kazakhstan amounted to 158.8 billion dollars, having decreased by 5% over the year, as evidenced by the data provided by the Ministry of National Economy of the Republic of Kazakhstan (Table 5) (Data of the Ministry of National Economy of the Republic of Kazakhstan for 2014-2018).

Table 5. Change in the structure of gross external debt for 2014-2018,%

Indicator	2014	2015	2016	2017	2018
Governmentbodies	7,3	11,3	12,1	12,1	11,6
Banksandothersectors	69,7	44,5	46,0	50,1	45,4
Intercompanydebt	79,6	96,7	104,5	104,1	101,1
Centralbank	1,0	0,9	0,8	0,9	0,8
Ratio of gross external debt to GDP (%, including intercompany debt)	71,2	83,2	119,0	102,7	93,1

Source: compiled by authors according to the data the Ministry of National Economy of the Republic of Kazakhstan

The ratio of external debt to GDP for the first time since 2016 was 93.1% (which should not exceed 100%). The main share of external debt (63.6% or a little more than $ 100 billion) falls on intercompany debt - it arises when

the head a company (non-resident) supplies its subsidiary (resident), for example, equipment that will be paid in a year.

Among the main reasons for the reduction of the country's external debt by 4.2% are:
- repayment of short-term notes of the National Bank;
- decrease in demand from foreign investors;
- repayment by oil and gas companies of loans from foreign companies and external loans attracted from state and financial Chinese organizations.

Thus, over the past 5 years, following the results of two quarters, the costs of servicing the state debt increased following the debt by 3 times (162.3 billion tenge), from 86.4 to 248.7 billion tenge (Figure 1) (https://kursiv.kz/news/finansy/2018-08/gosdolg-kazakhstana-uvelichilsya-na-219-za-god).
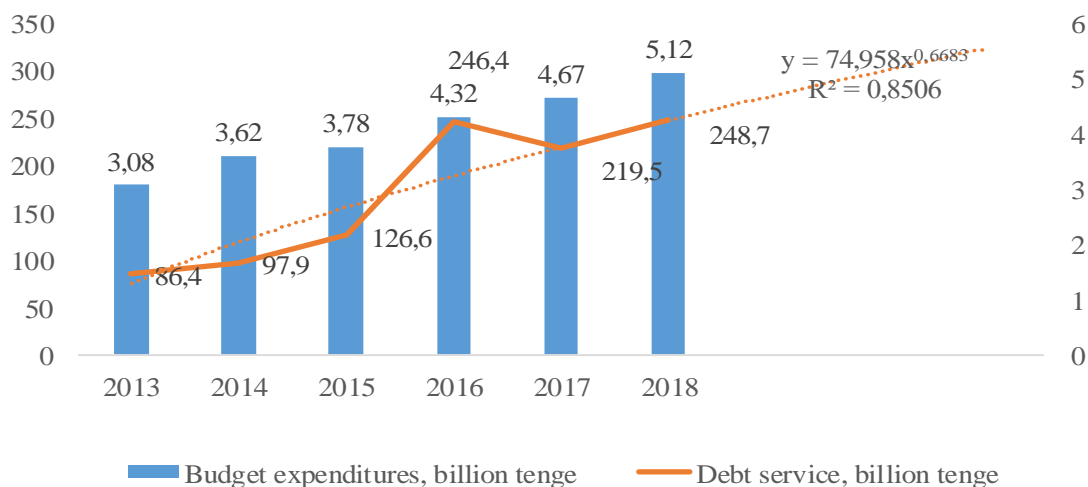
Figure 1. The dynamics of state budget expenditures and debt servicing in the Republic of Kazakhstan for the period from 2013-2018.
Source: compiled by authors based on the data of the electronic source:
Kursiv https://kursiv.kz/news/finansy/2018-08/gosdolg-kazakhstana-uvelichilsya-na-219-za-god

The external debt of government bodies decreased by $ 0.5 billion and amounted to $ 11.6 billion, or 7.3% of the gross external debt. The external debt of banks and other sectors decreased by 4.7 billion and amounted to $ 45.4 billion with a 28.6% share in the structure of the Ministry of Internal Affairs.

According to the data of the National Bank of the Republic of Kazakhstan, the structure of external borrowing by type of economic activity for 2018 indicates that loans are mainly attracted to the raw materials industries (Figure 2) (Data of the National Bank of the Republic of Kazakhstan for 2018).
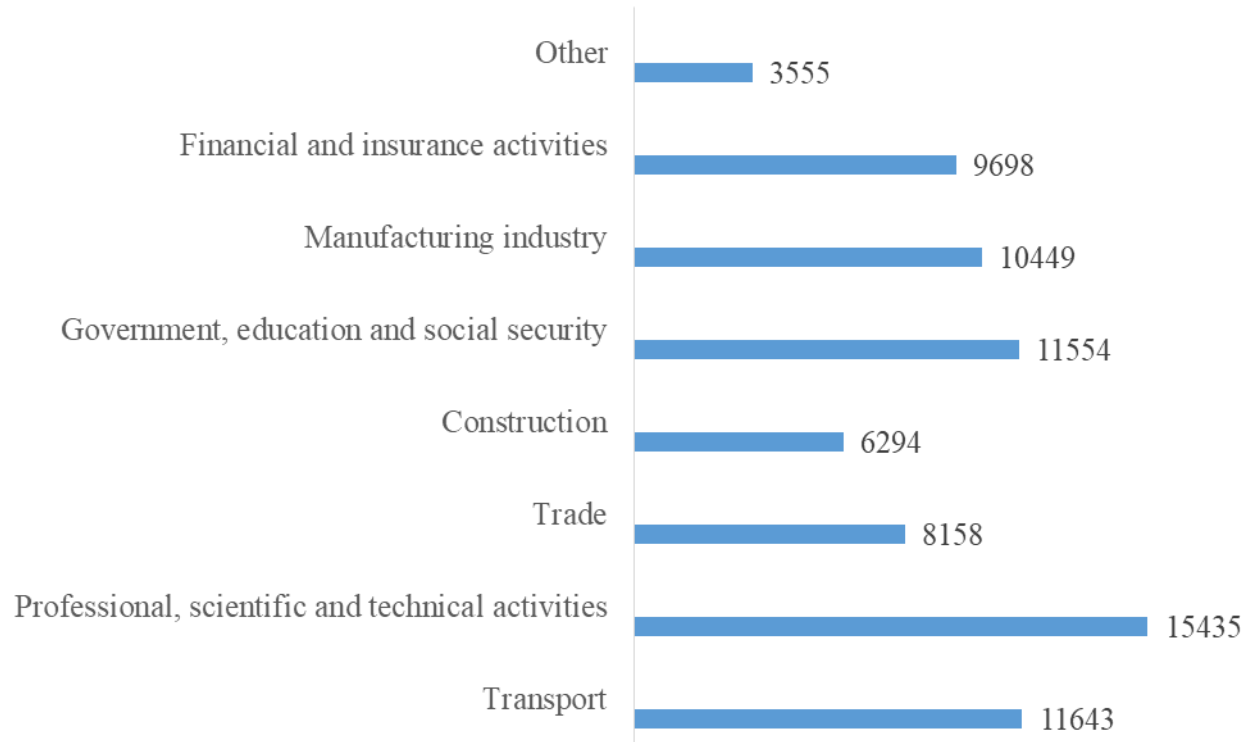
Figure 2. Structure of external borrowing by types of economic activity for 2018, million US dollars.
Source: compiled by authors according to the data of the National Bank of the Republic of Kazakhstan

For example, the mining industry accounts for 51.6% of the total external debt, or 82 billion dollars of which the bulk (75.7 billion) is the oil and gas sector of the economy. The reason for such a high borrowing rate is that at the stage of launching oil and gas projects, the country's infrastructure was not developed; there was no possibility of financing projects using our own funds. Due to the inability of Kazakhstan companies to borrow on foreign markets, the only possible way of financing was direct foreign investment (Table 6) (Kuratova 2019).

Table 6. Dynamics of income to payment in Kazakhstan by components (in% of GDP)

Year	Directinvestment	Portfolioinvestment
2005	8	1
2006	10	2
2007	11	3
2008	13	3
2009	10	3
2010	12	1
2011	13	1
2012	12	1
2013	10	1
2014	9	1
2015	5	1
2016	9	1
2017	10	1
2018	12	1

Source: compiled by authors according to the source Kuratova

The external debt of the Transport sector amounted to $ 11.6 billion (7.3%), of which 7.5 billion, or 4.7% of the total structure of the Ministry of Internal Affairs, was accounted for by pipeline transport or the oil and gas sector.

A significant amount also falls on the service sector. For example, professional, scientific, and technical activities account for 9.7% of the Internal Affairs Directorate ($ 15.4 billion), of which 10.5 billion were attracted by the activities of parent companies and management consultations. In the field of public administration, education and social security, external debt amounted to $ 11.6 billion, or 7.3%.

If we consider the country's gross external debt, Kazakhstan has the largest debt to the Netherlands - $ 48.9 billion, or 30.8% of the total debt, the UK - $ 21.9 billion (13.8%), the United States - 12 , 2 billion (7.7%) and China - 11.6 billion (7.3%) (Figure 3) (Data of the National Bank of the Republic of Kazakhstan for 2018).
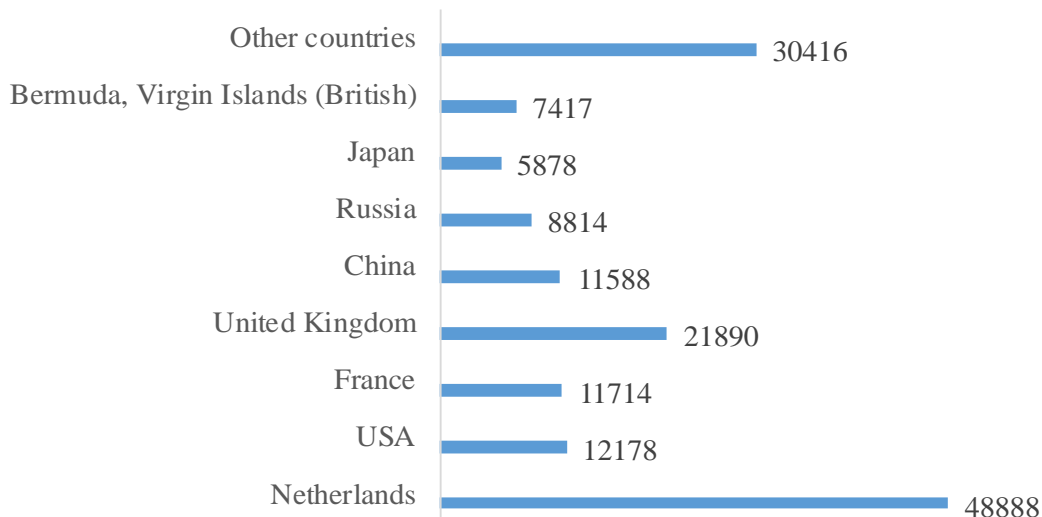
Figure 3. Structure of gross external debt by countries for 2018, million US dollars
Source: compiled by authors according to the data of the National Bank of the Republic of Kazakhstan

Also, the quasi-public sector has a great influence on the financial stability of Kazakhstan, the data of which indicate that the debt growth of the quasi-public sector has slowed significantly, namely of three entities - NWF Samruk-Kazyna JSC, Baiterek NMH JSC and KazAgro. In 2018, it increased by 36.2 billion tenge or 0.3% (in 2017, the growth was 6%) and amounted to 14.15 trillion tenge (36.2 billion dollars) (Table 7) (https://kursiv.kz/news/finansy/2018-08/gosdolg-kazakhstana-uvelichilsya-na-219-za-god).

Table 7. Debt indicators of quasi-public sector entities for 2016-2018 (billion tenge)

Indicator	2016	2017	2018
JSC"WF SamrukKazyna"	9276	9887	9207
JSC "NMH" Baiterek "	3057	3194	3243
JSC "NMH" KazAgro "	992	1031	1509
% to GDP	28,4	26,6	24,1

Source: compiled by authors according to the data the Ministry of National Economy of the Republic of Kazakhstan

The largest share of 64.9% in the sector belongs to NWF Samruk-Kazyna JSC with more than 9.2 trillion tenge or $ 24 billion (in 2017 about 9.8 trillion tenge). The company was able to lower its loans for 679.7 billion tenge, primarily due to the payment of the debt raised to purchase a 50% stake in KMG Kashagan. However, there has been an increase in loans for four subsidiaries of the fund:
- United Chemical Company LLP - by 179.9 billion tenge;
- JSC "NK" KazakhstanTemirZholy "- by 114.9 billion tenge;
- NAC Kazatomprom JSC - by 76.2 billion tenge;
- JSC Kazakhtelecom - 64.5 billion tenge.

The debt of Baiterek NMH together with its daughters reached 24.2% of the quasi-sector debt structure - it grew to 3.43 trillion tenge or 8.9 billion dollars (in 2017, the debt amounted to 3.1 trillion tenge). For the company itself, domestic debt grew by 193.8 billion tenge and for three joint - stock companies by 59.6 billion:
- JSC "BaiterekVentureFund" - by 39.8 billion tenge;
- JSC "Housing Construction Savings Bank of Kazakhstan" - 16.8 billion tenge;
- Kazakhstan Mortgage Company JSC - by three billion tenge.

The debt of KazAgro NMH JSC increased by 46.4% and amounted to 1.51 trillion tenge or $ 3.9 billion (in 2017, it amounted to almost a trillion tenge). There is an increase in JSC "Agrarian Credit Corporation" - by 221, 4 billion tenge and for KazAgroFinance JSC - by 132.5 billion tenge.

In general, the total external debt of the government and the external debt of quasi-public sector entities reached $ 35.9 billion, which is 62.2% of the National Fund's currency assets ($ 57.7 billion).

Having such indicators of public debt, which were considered by the author, the question arises of the effectiveness of public finance management and, accordingly, a competent approach to managing the country's public debt.

As Yu.Ya.Vavilov and E.G.Kovalishin note, public debt management is a set of financial measures of the state related to the repayment of loans, organization of payment of income on them, the conversion and consolidation of state loans (Vavilov & Kovalishin 2007).

Properly managing the possibility of attracting borrowed funds (and, as a result, increasing public debt), it is possible not only to improve the economic situation in the country and solve acute social problems as consequences of public debt, but simply use it as a source of financing in accordance with the principles of competent financial management with great benefit to their country (Burns and DeVillé, 2017; Blanco-Encomienda and Ruiz-García, 2017).

Conclusions

Currently, the country has formed a legislative framework regulating the management of public and state-guaranteed debt. The measures carried out by the Government of the Republic of Kazakhstan make it possible to maintain state and state-guaranteed debt at a level acceptable to the country.

But the analysis showed that there was no systematic approach to managing external debt in Kazakhstan. The lack of an effective system for monitoring external borrowing and proper control over their placement within the country has created a threat to the national economic security of the Republic of Kazakhstan. After the global financial crisis, Kazakhstan revised its strategy to attract external borrowing. As a result, thanks to the anti-crisis measures adopted in Kazakhstan and the high world prices for mineral resources that were established during this period, we managed to slightly reduce the growth rate of external debt. However, the structure of the external debt of the republic is still not optimal for the purposes of its effective management. In addition, enormous resources are diverted to servicing external debt, exceeding the costs of most large items of the republican budget, which significantly reduces the investment potential and economic development opportunities of our country.

In our opinion, the main problem of external debt is obvious and lies in a strong vulnerability to the exchange rate factor - devaluation greatly increases its size and dramatically complicates the servicing process. Therefore, a natural solution in the current situation is to reduce the external debt as quickly as possible, that is, stop receiving new loans abroad, or receive them in tenge.

Of course, the key problem of the state is the low efficiency of the economy, which does not allow the budget to be formed and executed without borrowing funds in ever-growing volumes.

The lack of an effective system for monitoring external borrowing and proper control over their placement within the country has created a threat to the national economic security of the Republic of Kazakhstan. After the global financial crisis, Kazakhstan revised its strategy to attract external borrowing. As a result, thanks to anti-crisis measures adopted in Kazakhstan and high world prices for mineral resources established during this period, it was possible to slightly reduce the growth rate of external debt. However, the structure of the external debt of the republic is still not optimal for the purposes of its effective management. In addition, enormous resources are diverted to servicing external debt, exceeding the costs of most large items of the republican budget, which significantly reduces the investment potential and economic development opportunities of our country.

Given world practice, it is customary to use its ratio with GDP to assess the situation with public debt. In large developed economies, this ratio is very large, it varies in different countries around 100%, and against this background, Kazakhstan's figure of 27% may seem successful. However, it is not. Two main parameters testify to the situation in Kazakhstan:
- debt growth dynamics, both in absolute and in relative terms;
- the growth of budget costs for its maintenance.

The more money you have to spend on debt service, the less it remains for other budgetary needs. The larger the size of these expenses, the greater the debt itself becomes, because old loans are repaid at the expense of new ones. This means that there is an acceleration of debt buildup (Table 8) (Data of the Ministry of Finance of the Republic of Kazakhstan for 2014-2018).

Table 8. Long-Term Forecast of Loan and Government Debt Receipts

Indicator	2019	2020	2021	2022	2023
The receipt of loans, billion tenge:	1612,1	1633,4	1649,5	1701,2	2225,7
- domestic government loans	1491,2	1496,6	1534,8	1603,7	2082,2
- external government loans	120,9	136,8	114,7	97,5	143,5
Government debt, billion tenge:	11897	12895	13831	1463	15504
- domestic, billion tenge	7135	8332	9326	10161	11354
- external, billion tenge	4762	4562	4506	4473	4150

Source: compiled by authors according to the data the Ministry of National Economy of the Republic of Kazakhstan for 2014-2018 & forecast of socio-economic development of the Republic of Kazakhstan for 2019-2023

According to the forecast, which is shown in Table 8, the main problem of the external debt is obvious and lies in the strong vulnerability to the exchange rate factor - devaluation greatly increases its size and dramatically complicates the servicing process. Therefore, the natural solution in the current situation is to reduce the external debt as quickly as possible - stop receiving new loans abroad, or receive them in tenge. But the key problem with public debt is more general in nature and is associated with the low efficiency of the economy, which does not allow the formation and execution of the budget without borrowing in constantly growing volumes. Therefore, in the near future, the debt problem may become one of the main in Kazakhstan, despite the fact that the ratio of debt to GDP is still small by world standards. Therefore, in order to reduce the country's dependence on external borrowing, it is necessary to further improve the external debt management strategy, which will attract the necessary amount of financing and ensure the fulfillment of payment obligations at the lowest cost in the medium and long term with a reasonable degree of risk. This strategy should be aimed at reducing the debt burden of the economy by improving the debt structure and improving the profile of debt payments, increasing the efficiency of borrowed funds and developing a sound policy for attracting new credit resources.

In addition, it is necessary to develop proposals for optimizing the structure of debt and it's servicing, including for early repayment, restructuring and refinancing of debt, as well as for managing borrowing risks. To keep the debt burden on the budget within the established limits, the Government needs to take measures to maintain the deficit of the republican budget, which will keep the country's external debt at a safe level.

Among the proposals to reduce public debt, Kazakhstan can include the following:
1. Optimization of government borrowing - is a program to optimize borrowing, in the framework of which maneuvering internal and external loans, including measures such as:
- ensuring the equivalence of current debts and future taxes;
- maintaining a balance in issuing activities and collecting taxes with the process of increasing debt and the size of its servicing;
-realization of debt stabilization policy in conjunction with the investment process;
-conducting measures to transform debt growth policies into restrictive policies that stabilize debt growth;
-the implementation of operations to redeem expensive issues of T-bills at the expense of funds raised during the placement of Eurobonds.
2. The extension of state domestic debt - is associated with the process of replacing "short" and "expensive" debts with "long" and "cheap" ones. The implementation of this method involves a reduction in borrowed funds through the placement of state short-term liabilities and a decrease in the yield on government securities.
3. Restructuring of debts to the budget of economic entities (enterprises and organizations).
4. Monitoring the borrowing of the subjects of the Republic of Kazakhstan.
5. An increase in the state's share in the capital structure of joint-stock (former state) enterprises.
6. Temporary transfer of property of debtor enterprises to state authorities.

7. State purchase of "bad" debts - the state exchanges debts at a reduced price for its long-term bonds. In this case, the priorities of the structural investment policy should be taken into account.
8. Offsetting debt claims and obligations.

The use of such tools to cover budget expenditures requires effective management of state authorities, providing for the impact of the subject on the object, which is expressed in the aggregate of tools, methods and mechanisms fixed by law taking into account the historical background of use.

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DEVELOPMENT TENDENCIES OF HEAT AND ENERGYRESOURCES: EVIDENCE OF KAZAKHSTAN

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Abstract. The article provides an analysis of the heat and energy resources of the Republic of Kazakhstan. A study of the global energy market, the trend of its development, raw materials for electricity production in the developed countries of the world. The basis of the energy potential of the Republic of Kazakhstan are large thermal power plants, therefore, an analysis of the development of the electricity sector of the Republic of Kazakhstan has been made. We will conduct a quantitative analysis of the prediction of the dynamics of the main resources in the fuel and energy complex of the Republic of Kazakhstan for the time series for 2010-2017 using the harmonic weights method, a forecast for the period 2018-2020 is given. Based on the models, recommendations for increasing the fuel and energy complex of the Republic of Kazakhstan were developed. Nowadays energetics is the most important driving force of world's economic progress and the electric power industry is one of the basic sectors of the economy, which plays an important role in political, economic and social spheres of any state.

Keywords: heat and power resources; world energy market; quantitative analysis; forecasting the dynamics of basic resources

1. Introduction

In one way or another structural changes have taken place in the economy of CIS countries, which, in their turn, predetermined the functioning and development of the entire energy sector including the electric power industry.

At the same time, the enormous and increasing pressure on the energy sector of Kazakhstan is already imposed by the task of diversifying the economy and accelerating the development of its manufacturing sector.

Another factor that contributes to the load increase on the energy sector is the problem of the survival and development of small cities, which are about 60 in Kazakhstan. And the main problem here is their electricity and heat supply (Mozglyakova 2016). Small cities, remote from fuel and energy sources that have a strategic demographic significance face a number of problems:
- lack of energy resources to ensure sustainable socio-economic development;
- need for an annual budget subsidies for the heating season;
- deterioration of the socio-economic situation with a decrease in production volumes or stop of city-forming enterprises (Ansoff 2015).

However as a result of the global financial crisis in the country, there was a decrease in production in industrial sectors and consequently a decrease in electricity consumption by the industrial sector, which accounted for 68.7% of the total electricity consumption in Kazakhstan.

According to the «World Energy Perspectives» report of the International Energy Agency global electricity demand growth rates outpace demand for all other types of energy. Since the 1970s the share of electricity consumption in the total volume of energy demand has increased from 9% to more than 17%, while by 2050 its share will increase to 25%. Nevertheless, regional growth rates and real demand will differ significantly: electricity consumption by OECD countries will remain almost unchanged, demand growth will be 16% in average; non-OECD regions' increase in demand will be more than 300%. By 2035 oil consumption will be concentrated in two sectors –transport and petrochemistry. High oil prices will contribute to the increase of the energy efficiency of production, which will weaken the position of oil in those sectors where alternative energy sources are available (International Energy Agency)

2. Literature review

The enormous and increasing pressure on the energy sector of Kazakhstan is already imposed by the task of diversifying the economy and accelerating the development of its manufacturing sector (Concept and Development Strategy for Sustainable Energy of the Future of Kazakhstan until 2050, 2013).

The current trends in the global energy market make it possible to predict a further increase in demand for energy resources (Thompson, Strickland 2016, Tvaronavičienė 2017; Melas et al. 2017; Tvaronavičienė 2018; Tvaronavičienė et al. 2018; Baltgailis 2019; Rezk et al., 2019; Energy Transformation towards Sustainability 2019; Masood et al. 2019; Sarma, et al., 2019).

Herewith, certain changes are predicted in the structure of the used energy carriers in the world. It is expected that there will be an increase in the use of almost all types of traditional and renewable energy sourcesin the entire world. In particular, the use of coal, gas, nuclear fuel and renewable energy sources will be increased in the production of electricity. At the same time, in the countries with the established industry, the fastest growth in the use of energy carriers will be noticeable in the field of using renewable energy sources and nuclear energy (Satkaliyev 2011; Shindina et al., 2018; Lisin et al., 2016; Kasperowicz et al., 2017).

3. Methodology

In most developed countries there has been a decrease in energy and material intensity of production in recent years. Energy consumption per unit of GDP and per capita is decreasing. Consequently, there is no longer a close relationship between GDP growth rates and energy production. In accordance with the existing forecasts for the development of the world energy complex, the trend towards a reduction in specific energy consumption will

continue in the upcoming decades (Korinko 2017; Borshchevska, 2016; Simionescu et al., 2017; Simionescu et al., 2019).

The production of electricity and heat is 80% dependent on coal, and the dependence of ferrous metallurgy is 100% in turn.

In several countries, coal is the main raw material for generating electricity.For example, the electric power output by using coal is 52% in the US, 54% in Germany, 72% in China.In our country, the coal industry, as well as oil and gas industries is the basis of the energy complex and the guarantor of the energy stability and security of our country. Today the Ekibastuz basin accounts for 65-70% of the total amount of coal mined by the country. There is more than 283 billion tons of coal in the coal fund of Kazakhstan, which makes it possible for coal self-sufficiency, being the largest exporter of coal products, holding a leading place in the region.

Most of the coal fund is located in Central Kazakhstan. Today such coal basins as Karagandinsky, Maikubensky, Ekibastuzsky and also fields as Shubarkolsky, Borlinsky, Kuu-Chekinsky and Yubileinoye are brought under. Since coal is not only fuel, but also a technological raw material, the intensive development of technologies for the deep processing of coal is possible, i.e. gasification, synthetic liquid fuels, chemical products.

According to experts, the demand for coal in Kazakhstan will increase in the near future.There are several largest coal producing companieson the territory of Pavlodar region: «Bogatyr» LLP (30.7% of country's total mining) «North» LLP (21,7%), «Maykuben-West» LLP (2,3%) , and also on the territory of Karaganda region: «Mittal Steel Temirtau » JSC (13,1%), «Borly» OJSC and «Kazakhmys» LLP (8,8%). On top of that coking coal, which is the most valuable, is mined only in the Karaganda basin.

When deciding on the development of the coal industry in Kazakhstan, it is necessary to keep in mind technological and economic factors. The technological factor determines the quality of coal of various grades, as well as their use in the national economy and the economic factor is the economic efficiency of the coal industry.
The republic's energy potential basis consists of 59 large thermal power plants with a total capacity of about 19,000 MW. Practically in every major city, mainly in regional centers, there is a powerful heat and power plant; there are several state district power stations, in particular, Ekibastuz State District Power Station-1 and State District Power Station-2, the first blocks of which were put into operation during the USSR.At the moment, it is expanding with the introduction of new energy units. Most of the large power plants (80%) run on coal.

Kazakhstan has 15 hydraulic power plants with a total capacity of more than 2,270 MW, five of which have a capacity of more than 100 MW (Shulbinskaya – 700 MW, Bukhtarminskaya – 675 MW, Ust-Kamenogorskaya – 330 MWon Irtysh River, Kapchagaiskaya – 364 MW on Ile river, Chardarinskaya – 100 MW on Syrdariyariver). Other state power plants have less than 10 MW power capacities.

The Unified Energy System unites all major energy sources using power lines in Kazakhstan. The energy sector state policy is aimed at increasing the efficiency of energy resources usage and creating the required conditions for shifting the country's economy to an energy efficient development path; sustainable provision of the population and the economy with electricity and heat; ensuring sustainable development in the conditions of market relations; increase the export potential of electricity; reducing the negative impact on the environment; ensuring the energy security of the country (I llashenko 2016).

For today, ensuring the required volumes of expansion, modernization of existing and construction of new power facilities, as well as the creation of export, transit potential of the essential power reserves is the most important state task.

Fixed enterprise facilities of fuel and energy complex of Kazakhstan, which include the technological level and technical condition, predetermine their competitiveness.

Fuel and energy complex is Kazakhstan's locomotive of economic growth, which includes major non-renewable resources, such as the coal industry, the oil and gas sector, electricity and heat and power engineering.Dynamics are shown on Table 1.

Table 1.Dynamics of main resources in fuel and energy complex of Kazakhstan between 2010 and 2017

Types of economic activity	Industrial output by year							
	2010	2011	2012	2013	2014	2015	2016	2017
Coal mining, including coal concentrate, thousand tons	111072	100854	110929	116449	120528	119574	114563	107318
Oil production, including gas condensate, thousandtons	70671	76483	79685	80061	79225	81787	80826	79459
Electricity generation by thermal power plants, Million KW/h	80 341	78 729	76 621	78651	82900	84760	78049	73078
Heat energy production, thousand GCal	94102	93734	96387	98021	103350	94099	80975	80792

Source: compiled by authors according to the statistical data

Analysis of the development of the electricity sector of the economy is important in terms of forecasting the reliability and energy supply of the country's economic growth.

We will conduct a quantitative analysis of forecasting the dynamics of the main resources in the fuel and energy complex of the Republic of Kazakhstan between 2010 and 2017 using the harmonic weights method.This method is proposed by a Polish statistician Z.Helvig. The main idea of the method is that the observations of the time series are valued in such a way that more value is given to later observations.The advantages of the harmonic weights method compared to other methods, which also use time series level weighting, is that no assumptions about the trend type should be made when applying it (Fedoseev & Garmash 2000).

For the calculated values we use the data given in Table 1.In such a situation, it can be conditionally taken that a certain approximation of the true trend $\hat{f}(t)$ is a broken line $f(t)$ smoothing a given number of points in the y_t time series. Changing the positions of individual segments of the broken line describes continuous changes in its individual phases. To determine the individual phases of the moving trend movement, choose the number k<n. Each phase of this movement is described by the equation. Based on the fact that it is intended to carry out medium-term forecasting, we will take = 5.

According to Table 1, equations were found to describe the individual phases of the sliding trend movement, given in Table 2. The method of least squares was used to estimate the parameters of the equations. The number of equations is n – k + 1 = 8 – 5 + 1 = 4.

Table 2. Equations for calculating the sliding trend

	Equations	Time moments
1	$y_1(t) = 101614,3 + 3450,70t$	t=1,2,3,4,5
2	$y_2(t) = 94851,20 + 4703,90t$	t=2,3,4,5,6
3	$y_3(t) = 111212,1 + 1039,30t$	t=3,4,5,6,7
4	$y_4(t) = 130222,6 - 2422,70t$	t=4,5,6,7,8

Source: compiled by authors

Based on these equations, the values of the sliding trend were determined. Calculated values of each $y_i(t)$ and average value $\bar{y}_i(t)$ using formula:

$$\bar{y}_i(t) = \frac{\sum_{q=1}^{t} a_q + t \sum_{q=1}^{t} b_q}{t} \quad \text{for } 1 \le t \le k \tag{1}$$

Table 3. Trend time series, sliding trend values, deviations from the trend in absolute terms and as a percentage

t	y_t	$\bar{y}_j(t)$	ε_t	E	ω_{t+1}	C_{t+l}^n
1	111072,0	105065,0	-6007,0	5,40	0,00	0,000000
2	100854,0	106387,4	5533,35	5,50	1322,35	0,020410
3	110929,0	111753,1	824,100	0,70	5365,75	0,044220
4	116449,0	116246,3	-202,75	0,20	4493,15	0,072790
5	120528,0	117939,1	-2589,0	2,10	1692,80	0,108500
6	119574,0	118736,3	-837,70	0,70	797,25	0,156120
7	114563,0	115875,5	1312,45	1,10	-2860,85	0,227550
8	107318,0	110841,0	3523,00	3,30	-5034,45	0,370410

Source: compiled by authors

The computational method consists of the following main steps:

First we find the increments ω_{t+1} of f(t):

$$\omega_{t+1} = f(t+1) - f(t) = \bar{y}_{t+1} - \bar{y}_t \tag{2}$$

Further we calculate the average increments:

$$\bar{\bar{\omega}} = \sum_{t=1}^{n-1} C_{t+l}^n \omega_{t+l} \tag{3}$$

Where C_{t+l}^n - coefficients, satisfying the following conditions:

$C_{t+l}^n > 0$, t = 1, 2, …, (n-1)

$$\sum_{t=1}^{n-1} C_{t+l}^{n} = 1 \qquad (4)$$

According to this expression information relating to later periods is given greater weights, since weight increments are inversely proportional to the time that separates the earlier and the later information for the moment $t=n$ (Poplavskaya 2018). If the earliest information has weight of

$$m_2 = \frac{1}{n-1}$$

Then in formation weight, related to the next point in timeline is:

$$m_3 = m_2 + \frac{1}{n-2} = \frac{1}{n-1} + \frac{1}{n-2}$$

In general the series of weights is determined by the equation (Sedelev 2016):

$$m_{t+1} = m_t + \frac{1}{n-t} \, , \, t = 2, 3, \ldots, (n\text{-}1) \qquad (5)$$

The solution of this equation is:

$$m_{t+1} = \sum_{i=1}^{t} \frac{1}{n-i} \quad , \, t = 1, 2, \ldots, (n\text{-}1) \qquad (6)$$

Calculation S_ω of number sequence ω_{t+1} is carried out according to the formula:

$$S_\omega^2 = \sum_{t=1}^{n-1} C_{t+1}^n (\omega_{t+1} - \overline{\overline{\omega}})^2 \quad , \quad S_\omega = \sqrt{S_\omega^2} \qquad (7)$$

As noted earlier, ω_{t+1} is interpreted as a random variable with a mathematical expectation $M(\omega)$ and dispersion $D(\omega)$.

By Chebyshev's inequality we get:

$P\{ |\omega_{t+1} - M(\omega)| > a\sigma_\omega \} < 1/a^2$

Where a – a given positive integer.

Characteristics of a in the above expression are constant. It can be assumed that in the prediction the value of a will be variable. This assumption is based on the fact that ω_{t+1} are correlated with each other, i.e. even if not so much, they will differ from each other and slightly deviate from $\overline{\overline{\omega}}$ and these deviations will increase as you move

to the left and right of the point t_0 along the abscissas. It means that parameter a should be a function of distance from l, where $l = 0, 1, 2, …, (n-1)$. This function $a(l)$ is definedby formula (Rozanova 2013):

$$a(l) = a \sum_{t=1}^{l+1} C_{n-t+1}^{n} \quad , \ l = 0, 1, 2, …, (n-1) \tag{8}$$

Find values of $a(l)$ by making a in Chebyshev's inequality equal to 4 (Lepitanova 2015). To obtain confidential intervals, we calculate the $a(l)S_\omega$ product. Predicted values will be obtained by the formula:

$$\bar{y}_{t+1}^{*} = \bar{y}_t^{*} + \omega_{t+1}^{*} \quad , t = n - l + 1 \tag{9}$$

And confidential intervals by the formula:

$$\bar{y}_{t+l}^{*} - a(l)S\omega \le \bar{y}_{t+l}^{*} \le \bar{y}_{t+l}^{*} + a(l)S\omega \tag{10}$$

The results of all these calculations are presented in Table 4.

Table 4. Forecast of the dynamics of main resources in fuel and heat complex of Republic of Kazakhstan in 2018-2020.

Year	t	$\overline{\overline{\omega}}$	$\bar{y}_t^{*}$	l	$a(l)$	$a(l)S_\omega$	$\bar{y}_t^{*} - a(l)S\omega$	$\bar{y}_t^{*} + a(l)S\omega$
2018	9	-1616,34	109224,7	1	2,39184	8225,498	100999,2	117450,2
2019	10	-1616,34	107608,3	2	3,01632	10373,07	97235,25	117981,4
2020	11	-1616,34	105992,0	3	3,45032	11865,59	94126,39	117857,6

Source: compiled by authors

Imagine the results of the predicted values in tabular form as follows:

Table 5. Forecast of the dynamics of the main resources in fuel and energy complex of the Republic of Kazakhstanin 2018-2020.

Types of economic activity	Estimated parameters of trend models by type of economic activity		
Coal mining, including coal concentrate, thousand tons		Equations	Points in time
	1	$y_1(t)= 101614,3+ 3450,70t$	t=1,2,3,4,5
	2	$y_2(t)= 94851,20+ 4703,90t$	t=2,3,4,5,6
	3	$y_3(t)= 111212,1+ 1039,30t$	t=3,4,5,6,7
	4	$y_4(t)= 130222,6–2422,70t$	t=4,5,6,7,8
	Year	Forecast	Upper confidential interval	Lower confidential interval
	2018	109224,7	117450,2	100999,2
	2019	107608,3	117981,4	97235,25
	2020	105992,0	117857,6	94126,39

Oil production, including gas condensate, thousandtons		Equations		Points in time
	1	$y_1(t)= 71019,20+ 2068,60t$		t=1,2,3,4,5
	2	$y_2(t)= 75389,00+ 1014,80t$		t=2,3,4,5,6
	3	$y_3(t)= 78312,80+ 400,80t$		t=3,4,5,6,7
	4	$y_4(t)= 80033,40+ 39,70t$		t=4,5,6,7,8
	Year	Forecast	Upper confidential interval	Lower confidential interval
	2018	80577,59	82467,67	78687,52
	2019	80804,19	83187,73	78420,64
	2020	81030,78	83757,28	78304,27
Electricity generation by thermal power plants, Million KW/h		Equations		Points in time
	1	$y_1(t)= 77936,40+ 504,00t$		t=1,2,3,4,5
	2	$y_2(t)= 72995,80+ 1834,10t$		t=2,3,4,5,6
	3	$y_3(t)= 75713,70+ 896,50t$		t=3,4,5,6,7
	4	$y_4(t)= 89085,80–1599,70t$		t=4,5,6,7,8
	Year	Forecast	Upper confidential interval	Lower confidential interval
	2018	74865,12	79547,59	70182,65
	2019	73442,04	79347,05	67537,03
	2020	72018,96	78773,60	65264,32
Heat energy production, thousand GCal		Equations		Points in time
	1	$y_1(t)= 90283,90+ 2278,30t$		t=1,2,3,4,5
	2	$y_2(t)= 94041,00+ 769,30t$		t=2,3,4,5,6
	3	$y_3(t)= 111939,4–3474,60t$		t=3,4,5,6,7
	4	$y_4(t)= 125547,2–5683,30t$		t=4,5,6,7,8
	Year	Forecast	Upper confidential interval	Lower confidential interval
	2018	75492,78	83025,80	67959,76
	2019	70904,76	80404,56	61404,96
	2020	66316,74	77183,41	55450,07

Source: compiled by authors

Conclusions

Based on the calculated indicators and their recommended values, we can make a conclusion about the degree of confidence in the obtained forecast models. The volume of coal production depends on the mode of operation of energy companies and has a seasonal nature (Omarova et al. 2018). Coal demand is reduced due to seasonality in order to prevent large amounts of coal from being stored in warehouses in order to avoid endogenous fires and loss of coal quality.These reasons determine the seasonal decline in domestic consumption. It can be assumed that under the conditions of increasing the production volume and export of oil and gas products, the share of crude oil and gas in the overall structure of the fuel and economic balance will increase in near future.Kazakhstan can be attributed to countries with excess energy resources. The power industry of Kazakhstan is a fundamental component of this resource base.It is also a powerful sector of the economythat creates the basis for integration of economic, social and environmental components of the country's sustainable development into the world economy.

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FINANCIAL INCENTIVES TO INCREASE EFFICIENCY OF ACTIVITY OF AGRO-INDUSTRIAL COMPLEX

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Abstract. The relevance of the study is due to the feasibility of strengthening territorial food security through a competent import substitution policy in the industry, which will lead to an increase in the overall food security of our country.The analysis of indicators of the state of the food market and the provision of food to the population, the selection of the most optimal of them for making effective management decisions is an important task in developing a strategy for ensuring the country's food security. Therefore, the purpose of this article is to assess the increase in the efficiency of the agricultural sector of Kazakhstan. The article analyzes the statistical data of the Republic of Kazakhstan on ensuring food security in the country and the impact of financial incentives to increase the agricultural sector in Kazakhstan.The object of research is the system of functioning of the agro-industrial complex in the Republic of Kazakhstan.The theoretical basis of the study was the work of foreign and domestic scientists on the development of agribusiness. The formation, management and use of organization resources, management of socio-economic systems in the field of public catering. The information base of the study was composed of legislative and other regulatory acts of the Republic of Kazakhstan, statistical data of the Agency of the Republic of Kazakhstan on statistics, analytical materials, materials of scientific economic literature and periodicals, materials of scientific and practical conferences, data of electronic resources.

Keywords: agriculture; agricultural economy; agribusiness; agricultural products; agricultural production; crop production; livestock.

1. Introduction

Domestic agro-industrial complex remains a strategically significant core of the economy of our country, regardless of the difficulties of functioning. The production of essential products is concentrated here and this ensures food security.

Thus, the agro-industrial complex is distinguished by a high level of differentiation of areas of activity and complexity. Relations of all subjects, namely, there is a large reserve of optimization and ordering complex of values.

In his publications Golubev A.V. He believes that the main socio-economic goals of the development of the agro-industrial complex are:
- Achieving sustainable agricultural production growth;
- solution of the food problem of the state;
- providing people with non-food goods made from raw materials of the agricultural sector (Golubev 2015).

In his textbook "Agricultural Economics" Kovalenko N.Ya. describes the composition of the agro-industrial complex, which includes various areas, but despite their difference, they are closely interconnected, and for the productivity of the whole complex in general, the substantially effective functioning of all its elements, i.e. any industry (Kovalenko 2011).

The agro-industrial complex today, both in Kazakhstan and in Russia, has actually become one of the few industries in the economy that shows progress. And to a large extent, he began to act as a locomotive for the growth of the industrial sector (Sukhanova 2017).

Thus, having analyzed various points of view of researchers in this field, the author came to the conclusion that the agro-industrial complex is one of the most important sectors of the economy of any country. The importance of the agro-industrial complex consists not only in satisfying the needs of the population for food products, but also in the fact that it has a significant impact on improving the efficiency of national production.

2. Literature review

In the work "Economics" it was determined that resources are factors of production, while production resources are labor, land and capital. In the concept of "land" they included land used for agricultural or industrial purposes, as well as natural resources (Samuelson & Nordhouse 1999).

According to Popov N.A., the national economic system of the country is a single unified socio-economic system, including organically linked structure-forming components, the action of each of which mutually contributes to the development of both the remaining components and the entire system as a whole (Popov 2008).

Sharipov S.A. argues that today the intersectoral complex should be considered as a set of interconnected structures within industries in different areas of material production, as well as trade, united by similar process attributes. production, as well as the sale of finished goods (Sharipov 2007).

Volkova N.A., studying the economics of agriculture in her studies, describes that agriculture has a group of factors, these include labor, land and capital. Labor is a complex of physiological and intellectual capabilities of workers. Capital is the association of useful goods that are used in the manufacture of products and the receipt of raw materials from the rural sector. This includes transport, machine tools, warehouses, a variety of mechanical devices. The natural factor is the earth (Volkova 2013).

In science, there is no one approach to the description of the agro-industrial complex. So, a group of researchers believe that the agro-industrial complex is a complex intersectoral industrial and economic structure, the composition of which is explained by the union of agriculture and the associated industries (Volkova & Kovalenko & Makarova; Mura & Kljucnikov, 2018; Jermolajeva et al., 2017).

Popov. ON. He intends to consider the agro-industrial complex as an association of sectors of the national economy, where agriculture plays a key role. The researcher's interest is focused on the representation of the agro-industrial complex from the position of a holistic technological complex. This is manifested in the process of promoting a product from the first stage of production to its sale (Popov 2008).

In contrast to the points of view of the above authors, Sharipov. S.A. when considering the concept of "agro-industrial complex" also highlights the concept of "agri-food complex. Therefore, the scientist suggests understanding by the agro-industrial complex, along with the production of means of production, the food and processing industry, the food sector of the economy (agri-food complex) (Sharipov 2007).

The analyzed definitions of the concept of "agricultural complex" note such a significant feature as "the union or complex of industries", which, in our opinion, allows us to interpret the agro-industrial complex as an economic and legal system based on the functional relationship of industries in the economy. The economic and legal approach to the interpretation of the agricultural sector allows you to build a management mechanism on the positions of a system-value, environmentally responsible and cluster basis with the disclosure of strategic areas (Fillipova & Kolodina 2016; Musova et la., 2017; Kocisova et al., 2018; Moumen et al., 2019).

3. Methodology

The agro-industrial complex is one of the important sectors of the economy, which through the formation of the country's food security participates in ensuring the national security of the country, including industries for the production of agricultural products and their processing and bringing them to the consumer, and also provides agriculture and the processing industry with means of production.

In the structure of the agro-industrial complex, there are three main areas, or groups of industries and industries:
1 Agriculture (agriculture and livestock), forestry and fisheries.
2 Industries processing agricultural raw materials, food industry, light industry, cotton and wool.
The main tool to stimulate the accelerated development of the agro-industrial complex. It is a priority state support of investment projects aimed at import substitution within the framework of the State Program for the Development of Agriculture and the regulation of agricultural products, raw materials and food markets.

For the period from 1992 to 2017, the actual agricultural policy of Kazakhstan underwent a number of fundamental changes and resulted in several state programs:
1. The agricultural development program for 2000-2002;
2. The state program for the development of rural territories for 2004-2010;
3. The State Agricultural and Food Program for 2003-2005;
4. The agricultural development program for 2010-2014;
5. The program for the development of the agro-industrial complex in the Republic of Kazakhstan for 2013 - 2020 "Agribusiness 2020", approved by the Decree of the Government of the Republic of Kazakhstan dated February 18, 2013 No. 151 with separate sectoral master plans (The program for the development of the agro-industrial complex in the Republic of Kazakhstan for 2013 - 2020 "Agribusiness 2020" 2013);

6. The state program for the development of the agro-industrial complex of the Republic of Kazakhstan for 2017 - 2021 (Decree of the Government of the Republic of Kazakhstan "State Program for the Development of the Agro-Industrial Complex of the Republic of Kazakhstan for 2017 - 2021" 2018).

In addition to the State Program for the Development of the Agro-Industrial Complex of the Republic of Kazakhstan for 2017-2021 (hereinafter referred to as the Program for the Development of the Agro-Industrial Complex of the Republic of Kazakhstan), support for export potential through increasing the competitiveness of agribusiness entities is provided for in the Nurlyzhol State Infrastructure Development Program for 2015-2019. This program provides for the creation of an efficient transport and logistics infrastructure, ensuring the safety and quality of products through the development of laboratory facilities (Decree of the Government of the Republic of Kazakhstan "On approval of the State program of infrastructure development" Nurlyzhol" for 2015-2019" 2018).

Considering the agro-industrial complex in the Republic of Kazakhstan, the author carried out a SWOT analysis of the agro-industrial complex of the Republic of Kazakhstan, where nevertheless, at the moment there are still many unsolved problems that provide unfavorable incentives for the further development of this industry (The program for the development of the agro-industrial complex in the Republic of Kazakhstan for 2013 - 2020 "Agribusiness 2020" 2013) (Table 1).

Table 1. SWOT analysis of the agro-industrial complex of the Republic of Kazakhstan

Strengths	Weaknesses
- Kazakhstan occupies the ninth place in the world in terms of the area; - Kazakhstan occupies the second place in the world in terms of arable land per capita; - the presence of 1.4 million hectares of irrigated land; Kazakhstan is one of the largest exporters of grain and flour; - growing demand for food products in neighboring countries (CIS, Central Asia, China)	- low share of agricultural products in the country's GDP (4.8%); - low labor productivity against the background of a high share of employed (18% of the employed population) and a large rural population (43% of the total population); - low share of exports; underdeveloped trade and logistics infrastructure and the practical lack of electronic commerce; - low level of technology transfer; - scientific research is poorly focused on the needs of agricultural production; - the practical lack of private funding for research and technology transfer; - insufficient level of veterinary, phytosanitary and food safety; - high capital intensity; - long payback period; insufficient financing of the agro-industrial complex, including the lack of "cheap and long" money; - dependence on climatic conditions; - limited water resources and the formation of 44% of the runoff in the territory of neighboring states; - low level of competitiveness and profitability of agribusiness entities; - in the total volume of production a high share is occupied by uncompetitive products of low quality produced by personal subsidiary plots
Opportunities	Threats
- increase in production for all types of agricultural products; - creating conditions for the introduction of technologies and attracting investments, including large-scale digitalization of the agricultural sector; - expansion of the geography of deliveries and export volumes in promising sectors;	- instability of weather conditions, adverse changes in climatic conditions, deficit of water resources; - the spread of diseases of animals and plants, environmental pollution; - increased competition in international markets for certain types of products in connection with the entry into the WTO, EAEU;

- high potential for the production and export of organic products; increase the area of irrigated land and increase their efficiency; - creating conditions for turning agricultural science into a driver of increasing labor productivity and competitiveness of agribusiness sectors; - deep processing of eggs and obtaining liquid and powder products.	- the risk of inefficient state regulation of the industry

Source: compiled by authors

According to the Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan, the gross domestic product in Kazakhstan in 2017 increased, according to preliminary data, by 4%, which is significantly higher than in 2015 and 2016, when the growth reached 1.2% and 1, 1% respectively. And we can talk about the recovery in the economy. GDP growth was to a large extent ensured by an increase in production in the mining industry - by 9.3%, in particular, due to an improvement in the external economic situation in the commodity markets (Data of the Ministry of National Economy of the Republic of Kazakhstan for 2014-2017) (see Table 2).

Table 2. Analysis of GDP and agriculture of the Republic of Kazakhstan (% to previous year)

Indicator	2010	2011	2012	2013	2014	2015	2016	2017
GDP	8	8	5	6	4	2	3	5
Agriculture	-11	23	-14	9	2	5	6	3

Source: compiled by authors according to the source of the Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan

Gross agricultural output in 2017 increased by 2.9%. Growth was observed both in crop production (by 2.2%) and in livestock production (by 3.9%) (Table 3).

Table 3. Analysis of the agricultural sectors of the Republic of Kazakhstan (% to previous year)

Indicator	2010	2011	2012	2013	2014	2015	2016	2017
Agriculture	-11	23	-14	9	2	5	6	3
Plant growing	-20	48	-22	10	-5	5	8	3
Livestock	4	-1	-5	2	5	4	3	5

Source: compiled by authors according to the data the Ministry of National Economy of the Republic of Kazakhstan

The volume of investment in fixed assets in the economy in 2017 increased by 5.5% (5.1% in 2016). As the National Bank of the Republic of Kazakhstan notes, amid growing positive expectations from business and the stabilization of inflationary processes in the economy, investment activity has been positive since the beginning of 2017. At the same time, about 55% of investments in fixed assets were directed to the industrial sector, primarily in the extraction of crude oil and natural gas, which occurred against the backdrop of rising world oil prices (Data of the National Bank of the Republic of Kazakhstan for 2017).

Investments in agriculture, forestry and fisheries in 2017 increased compared to the previous year by a significant 29.3% and amounted to 352.5 billion tenge. According to the Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan, the main grain-growing regions - North Kazakhstan, Kostanai and Akmola regions - allocated 145.6 billion tenge to the industry, which accounted for most of the investments in agriculture, forestry and fisheries (41.3%). In 2016, investment growth was also significant and amounted to

46.7%. Such an increase in investment in the industry is to a large extent due to the implementation of state agricultural support programs (Table 4) (Food Contract Corporation www.fcc.kz).

Table 4. Investments in fixed capital of the Republic of Kazakhstan, total

Indicator	2010	2011	2012	2013	2014	2015	2016	2017
Agriculture	4	25	15	3	19	-9	48	30
Fixed investment	-4	4	5	9	5	4	45	30

Source: compiled by authors according to the source Food Contract Corporation www.fcc.kz

In this regard, in order to improve the investment climate at the end of 2017, the Ministry of Investment and Development of the Republic of Kazakhstan approved the National Investment Strategy for 2018-2022 (Decree of the Government of the Republic of Kazakhstan National Investment Strategy Investment Promotion Program 2017).
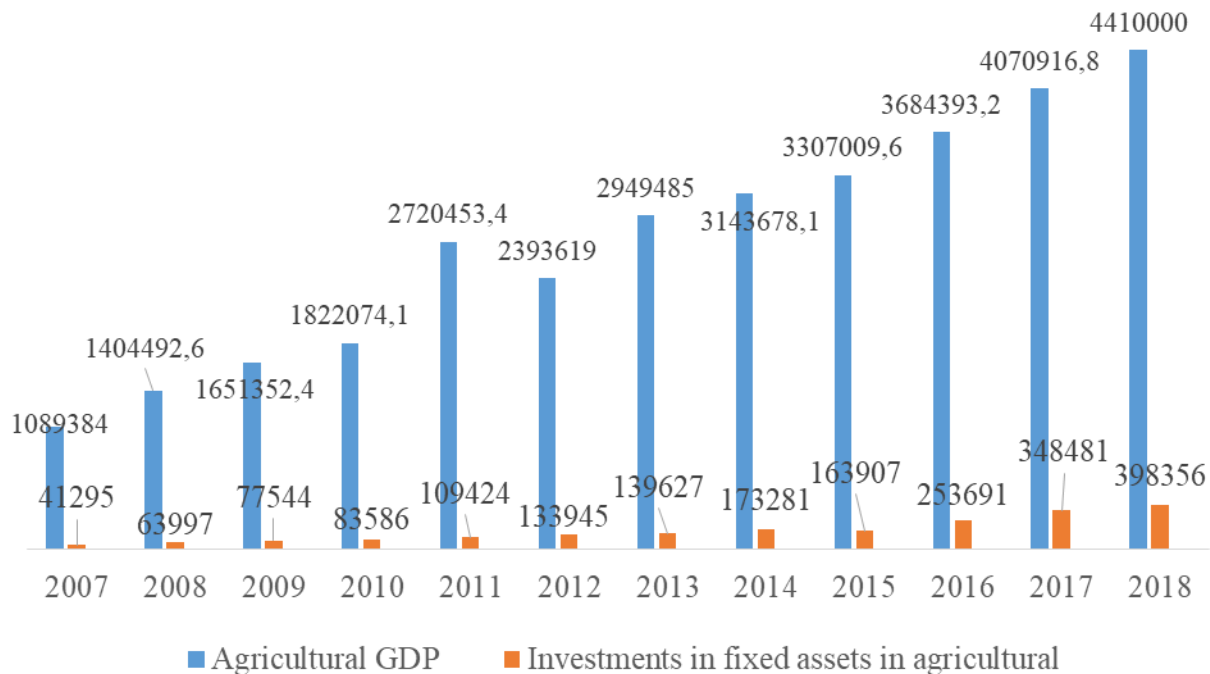
Figure 1. Indicators of gross agricultural output and investment in fixed assets over time, million tenge.
Source: compiled by authors

In accordance with the instruction of the President of the Republic of Kazakhstan, the strategy emphasized the need to attract foreign investment in non-resource sectors of the economy of Kazakhstan, as well as increase their export potential (Review of national programs and strategies for supporting the export of agricultural goods in post-Soviet countries. Food and Agriculture Organization of the United Nations 2018).

The study of the impact of fixed investment on production growth is a key issue in classical theories of economic growth (Figure 1).

In modern conditions, the task of conducting an operational predictive analysis of investment processes for the timely diagnosis of changing macroeconomic investment conditions by conducting model experiments based on the linear extrapolation method is no less acute.

When making forecasts using extrapolation, they usually proceed from statistically evolving trends in changes in certain quantitative characteristics of an object. Estimated functional system and structural characteristics are extrapolated.

4. Application functionality

We will build a model of forecast extrapolation using the actual data of the indicator of investments in fixed assets shown in Figure 1.

The linear trend equation will take the following form: $y = b\,t + a$ (Table 5).

Table 5. Least square equation calculated parameters

t	y	t^2	y^2	$t\,y$
1	109424	1	11973611776	109424
2	133945	4	17941263025	267890
3	139627	9	19495699129	418881
4	173281	16	30026304961	693124
5	163907	25	26865504649	819535
6	253691	36	64359123481	1522146
7	348481	49	121439007361	2439367
8	398356	64	158687502736	3186848
36	1720712	204	450788017118	9457215
Average value	215089	25,5	56348502139,75	1182151,875

Source: compiled by authors

For our data, the system of equations has the form:

$$\begin{cases} 8\,a + 36\,b = 1720712 \\ 36\,a + 204\,b = 9457215 \end{cases}$$

In the course of solving this system of equations, we obtain the equation of the trend model:

$y = 40809{,}786\,t + 31444{,}964$

The empirical trend coefficients a and b are only estimates of the theoretical coefficients β_i, and the equation itself reflects only the general trend in the behavior of the variables in question.

The trend coefficient $b = 40809.786$ shows the average change in the effective indicator (in units of measure y) with a change in the time period t per unit of measurement. In this example, with an increase of t by 1 unit, y will change on average by 40,809.786.

We will calculate the coefficient of determination:

$$R^2 = 1 - \frac{\sum(y_i - y_t)^2}{\sum(y_i - \bar{y})^2}$$

$$R^2 = 1 - \frac{10733372128,071}{80681793750} = 0,867$$

that is, in 86.7% of cases, t affects the change in y. In other words, the accuracy of the selection of the trend equation is high.

To assess the quality of the parameters of the equation, we construct a calculation table (table. 6)

Table 6. The calculated values of the quality assessment of the parameters of the equation

t	y	$y(t)$	$(y_i-y_{cp})^2$	$(y_i-y(t))^2$	$(t-t_p)^2$	$(y_i-y(t)) : y_i$
1	109424	72254.75	11165092225	1381553145.561	12.25	0.34
2	133945	113064.536	6584348736	435993788.786	6.25	0.156
3	139627	153874.321	5694513444	202986167.889	2.25	0.102
4	173281	194684.107	1747908864	458092995.369	0.25	0.124
5	163907	235493.893	2619597124	5124683228.94	0.25	0.437
6	253691	276303.679	1490114404	511333232.174	2.25	0.0891
7	348481	317113.464	17793425664	983922296.788	6.25	0.09
8	398356	357923.25	33586793289	1634807272.564	12.25	0.101
		1720712	80681793750	10733372128.071	42	1.439

Source: compiled by authors

Let us analyze the accuracy of determining estimates of the parameters of the trend equation:

Dispersion of the equation error.

$$S_y^2 = \frac{\sum(y_i - y_t)^2}{n - m - 1}$$

where m = 1 - the number of influencing factors in the trend model.

$$S_y^2 = \frac{10733372128,071}{6} = 1788895354,6785$$

Standard error of the equation.

$$S_y = \sqrt{S_y^2} = \sqrt{1788895354{,}6785} = 42295{,}3349$$

$$S_b = S_y \cdot \frac{\sqrt{\sum t^2}}{n\sigma_t}$$

$$S_b = 42295{,}3349 \cdot \frac{\sqrt{204}}{8 \cdot 2{,}2913} = 32956{,}259$$

$$S_a = \frac{S_y}{\sqrt{n}\sigma_t} = \frac{42295{,}3349}{2{,}2913\sqrt{8}} = 6526{,}312$$

We calculate the interval forecast model:

The calculation of the standard error of the predicted indicator is carried out according to the formula:

$$U_y = yn + L \pm K$$

where

$$K = t_a \cdot S_y \cdot \sqrt{1 + \frac{1}{n} + \frac{3(n + 2L - 1)^2}{n(n^2 - 1)}}$$

L - lead time; $y\,n + L$ - model prediction at the $(n + L)$ -th point in time; n - number of observations in the time series; Sy - standard error of the predicted indicator; Ttabl - table value of Student criterion for significance level α and for the number of degrees of freedom equal to n - 2.

According to the Student table we find Ttabl

Ttabl (n-m-1; $\alpha/2$) = 2,447

Point forecast, $t = 9$: $y(9) = 40809{,}786 \cdot 9 + 31444{,}964 = 398733{,}04$

$$K_1 = 2{,}447 \cdot 42295{,}33 \sqrt{1 + \frac{1}{8} + \frac{3(8 + 2 \cdot 1 - 1)^2}{8(8^2 - 1)}} = 131205{,}99$$

$398733{,}04 - 131205{,}99 = 267527{,}05$; $398733{,}04 + 131205{,}99 = 529939{,}03$

Interval forecast:

t = 9: (267527,05; 529939,03)

Point forecast, $t = 10$: $y(10) = 40809,786 \cdot 10 + 31444,964 = 439542,82$

$$K_2 = 2,447 \cdot 42295,33 \sqrt{1 + \frac{1}{8} + \frac{3(8 + 2 \cdot 2 - 1)^2}{8(8^2 - 1)}} = 140589,42$$

439542,82 – 140589,42 = 298953,4 ; 439542,82 + 140589,42 = 580132,24

Interval forecast:

t = 10: (298953,4; 580132,24)

Point forecast, $t = 11$: $y(11) = 40809,786 \cdot 11 + 31444,964 = 480352,61$

$$K_3 = 2,447 \cdot 42295,33 \sqrt{1 + \frac{1}{8} + \frac{3(8 + 2 \cdot 3 - 1)^2}{8(8^2 - 1)}} = 151082,2$$

480352,61 – 151082,2 = 329270,41 ; 480352,61 + 151082,2 = 631434,81

Interval forecast:

$t = 11$: (329270,41; 631434,81)

We perform hypothesis testing with respect to the coefficients of the linear trend equation:
1) t-statistics. Student criterion.
According to the Student table we find T_{tabl}

Ttabl (n-m-1; α/2) = (6; 0,025) = 2,447

$$t_a = \frac{a}{S_a}$$

$$t_a = \frac{40809,786}{6526,312} = 6,2531 > 2,447$$

The statistical significance of the coefficient *a* is confirmed. The estimation of the parameter *a* is significant and the trend *y* of the time series exists.

$$t_b = \frac{b}{S_b}$$

$$t_b = \frac{31444{,}9643}{32956{,}259} = 0{,}9541 < 2{,}447$$

The statistical significance of coefficient b is not confirmed.
2) *F*-statistics. Fisher criterion.
Coefficient of determination.

$$F = \frac{R^2}{1-R^2}\frac{n-m-1}{m} = \frac{0{,}867}{1-0{,}867}\frac{8-1-1}{1} = 39{,}1015$$

We find from the table $F_{cr}(1; 6; 0{,}05) = 5{,}99$
where *m* - number of factors in the trend equation (m=1).

Since $F > F_{cr}$, the determination coefficient (and the trend equation as a whole) is statistically significant. In the course of the study of the constructed model, the time dependence of *Y* on time *t* was studied. At the specification stage, a linear trend was selected. Its parameters are estimated by the least squares method.

The statistical significance of the equation was verified using the coefficient of determination and the Fisher test. It was found that in the studied situation 86.7% of the total variability of *Y* is explained by a change in the time parameter.

It was also established that the model parameters are not statistically significant. An economic interpretation of the model parameters is possible - with each period of time *t*, the *Y* value increases on average by 40809.786 units.

However, the degree of reality of such forecasts and, accordingly, the measure of trust in them are largely determined by the well-reasoned choice of extrapolation limits and the stability of the "meters" in relation to the essence of the phenomenon under consideration.

Considering the current dynamics, it can be noted that at the end of 2018, the volume of capital investments in the agricultural sector reached 175.7 billion tenge - this is 8.2% more than a year earlier (and + 5.3% in comparable prices). More than half of all investments fell on the three main breadbasket of Kazakhstan:
- North Kazakhstan region of North Kazakhstan region (immediately 25.7%);
- Kostanay region (13.9%);- Akmola region (11.2%) (electronic source: www.energyprom.kz).

Note that it was these three regions that, according to the results of last year, provided 72% of the total gross harvest of grain and leguminous crops and immediately more than 80% directly of wheat. In total, more than 15,000 organizations engaged in agricultural activities are registered in Kazakhstan (excluding forestry and fisheries). This is 3.5% of all organizations registered in Kazakhstan (Figure 2).
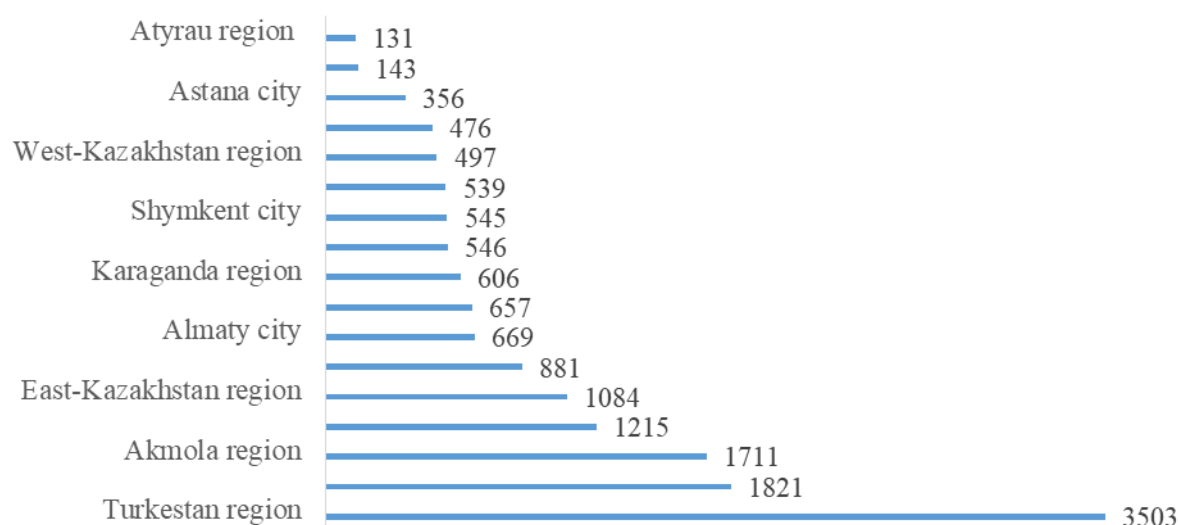
Figure 2. The number of enterprises by region for 2018**.**

Source: compiled by authors according to the data the Ministry of National Economy of the Republic of Kazakhstan

According to the Ministry of National Economy of the Republic of Kazakhstan for 2017-2018, investments in fixed assets of agriculture, forestry and fisheries indicate that the total value added of agriculture at the end of 2018 amounted to 557.3 billion tenge - this is 6.7% more than a year earlier, and 4% more in physical volume (Table 7) (Data of the Ministry of National Economy of the Republic of Kazakhstan for 2014-2017) (see Table 7).

Table 7. Investments in fixed assets of agriculture, forestry and fisheries (billion tenge)

Indicator	2018	2017	Annual growth, %
Agriculture, forestry and fisheries	175,69	162,43	8,2
Crop and livestock, hunting and the provision of services in these areas	175,22	161,86	8,3
Growing seasonal crops	107,15	99,35	7,9
Livestock	47,28	43,75	8,1
Mixed farming	12,41	14,01	-11,5
Growing perennial crops	7,56	3,54	113,8
Ancillary activities in the field of crop growing	0,83	0,98	-15,7
Nursery production	0,00	0,02	-90,1
Hunting and trapping, including the provision of services in these areas	-	0,22	-
Fisheries and Aquaculture	0,27	0,49	-43,9
Forestry and logging	0,20	0,08	151,7

Source: compiled by authors according to the data the Ministry of National Economy of the Republic of Kazakhstan

In accordance with Strategy-2050, by 2022 it is planned to increase the volume of investments in fixed assets of the non-primary sector of the economy (excluding the state budget) by 1.46 times, and the volume of external

investments in fixed assets of the non-primary sector of the economy will increase 1.5 times (Strategy 2050 www.strategy2050.kz).

Gross agricultural output in the Republic of Kazakhstan in monetary terms shows growth over the past 5 years. However, growth dynamics are declining (Figure 3) (Data of the Ministry of National Economy of the Republic of Kazakhstan for 2014-2017).
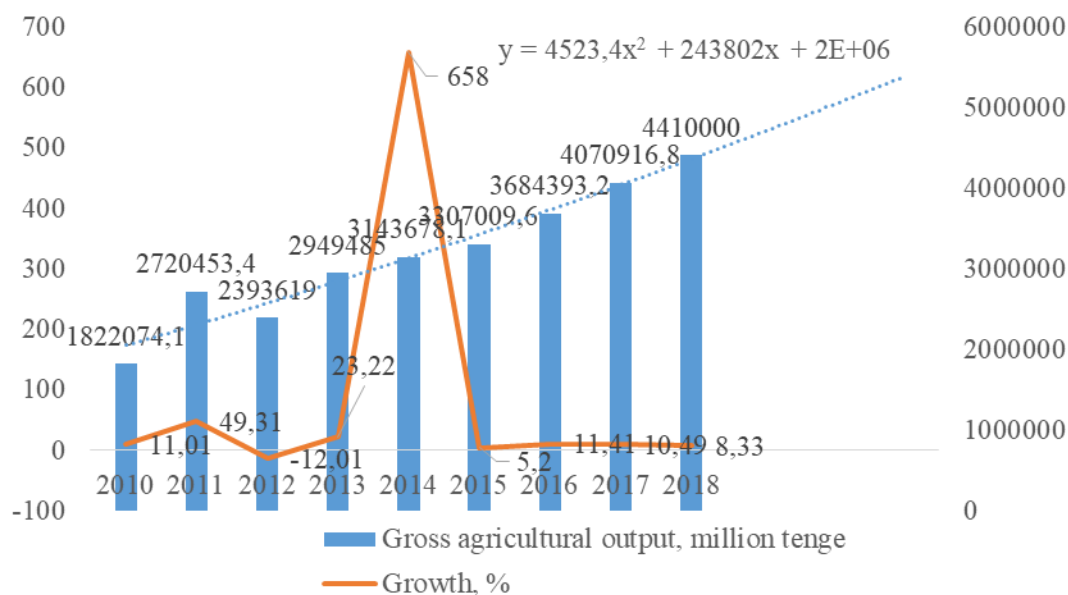

Figure 3. Gross agricultural output in the Republic of Kazakhstan for the period from 2010-2018, million tenge**.**
Source: compiled by authors according to the data the Ministry of National Economy of the Republic of Kazakhstan

In the framework of the State program "Digital Kazakhstan" for 2017-2020 the task is to introduce digital technologies to control food safety products coming to Kazakhstan from third countries, as well as exported from the country to other EAEU states (Table 8) (Decree of the Government of the Republic of Kazakhstan State program "Digital Kazakhstan" & Data of the Ministry of National Economy of the Republic of Kazakhstan for 2014-2017).

Table 8. Dynamics of import and export of animal and vegetable products, finished food products for the period 2012-2017

Indicator	Unit	2012	2013	2014	2015	2016	2017
import	million US dollars	4257,8	4619,4	4335,9	3393,1	3081,3	1646,2
export	million US dollars	2984,6	2733,4	2637,7	2136,2	2150,0	1667,9
import share	%	9,2	9,5	10,5	11,1	12,1	10,7
export share	%	3,5	3,2	3,3	4,6	5,9	4,3

Source: compiled by authors according to the data the Ministry of National Economy of the Republic of Kazakhstan

According to the data presented in table 8, there is still a trend towards a decrease in the volume of imports of basic food products in the Republic of Kazakhstan, in favor of an increase in domestic production. Regarding Kazakhstan, I would like to note that the low level of labor productivity in agriculture of the republic, the high level of depreciation of agricultural machinery (up to 70%), the imperfection of the technologies used, the small commodity production (75% of gross output falls on households and peasant farms) do not allow

intensive agricultural production, to ensure the most complete use of material, labor and other resources, to comply with environmental requirements. These factors reduce the competitiveness of the domestic agricultural sector, which, under the conditions of the WTO and the EAEU, can lead to the dominance of imports of foreign products, crowding out local producers from the sales markets and the risks of transferring the country's agriculture to its natural state. Today, 25% of the working population is employed in agriculture, which is of great importance for the country (Overview of the food industry of the Republic of Kazakhstan 2018).

It is obvious that the sustainable development of the agro-industrial complex and ensuring food security can be achieved only on the basis of a new paradigm of scientific and technical development of the agricultural sector, based on new knowledge and an innovative economy (Chuprov, 2016; Reiff et al., 2016).

To increase production and increase exports, it is necessary to revise the development of the agricultural sector:
- increase the availability of financing for agribusiness entities - investment subsidies, interest rate subsidies;
- given the long payback period, measures and financing should be provided for longer periods;
- optimal taxation;
- improving the use of land and water resources;
- accessibility of markets and export development;
- agricultural science;
- technology transfer and development of competencies of agribusiness entities;
- technical equipment and intensification of production;
- quality of public services and digitalization;
- rural development.

In the framework of the Address of the Head of State to the people of Kazakhstan "New Development Opportunities under the Fourth Industrial Revolution", the country's agro-industrial complex has been given the task of dramatically increasing labor productivity and increasing the export of processed agricultural products by at least 2.5 times over 5 years (Nazarbayev 2018).

Conclusions

The agricultural sector of the economy appears to be the part of the national economy with which the country's economic stability and independence begins, since more than two-thirds of the consumer market is formed due to food and goods produced from agricultural raw materials.

For the development and improvement of productive forces, it is necessary to ensure the formation of a favorable, "economically equivalent" market environment at the state level, in which the economy becomes susceptible to investment, and business entities have and expand investment opportunities and incentives for renewing fixed capital and building it up at the expense of own and borrowed funds, including foreign capital. To a large extent, this can be achieved by introducing a new, adequate market system of the economic mechanism of management, taking into account the specifics of agriculture (Kim & Abdishova 2017).

Investment processes in agriculture are subject to general economic laws, but are manifested taking into account the specific characteristics of the agricultural business. Features of agriculture, unlike industries, require a comprehensive analysis and consideration when forming the material and technical base and investment policy in the industry.

For Kazakhstan, the main condition for ensuring food security is the intensive development of agricultural and food industries, which will allow the agricultural sector to become a leading sector of the economy, which, ultimately, should contribute to the growth of the country's self-sufficiency in food. Given the importance of this

issue, the agricultural sector is given one of the main directions in the strategic policy of our state. The basis for enhancing food security is, above all, improving the functioning of the domestic agribusiness and its basic industries by:

- mobilization of the potential of our own agro-industrial production, capable of guaranteeing reliable provision of the country's population with domestic food, primarily its basic types, regardless of the situation on the world food market;

- the formation of competitive food markets, the creation of a legislative framework and infrastructure for their effective development, the protection of domestic agricultural producers from unhealthy competition and the unfavorable situation on world markets for agricultural products, raw materials and food;

- ensuring the optimization of intersectoral economic relations in order to achieve such a ratio of prices for agricultural and industrial products, which would stimulate the growth of expanded reproduction, especially in agriculture;

- improving the system of short-term, medium-term and especially long-term lending, ensuring the availability of loans for the bulk of agricultural producers, creating relatively favorable economic conditions for the attractiveness of investments and the growth of investment activity in agricultural production;

- creating a system of reliable guarantees of the quality of food supplied to the domestic market by ensuring tight control over the technologies applied throughout the food chain and, especially, for imported products;

- increasing and rational use of food resources by increasing the technological level of agricultural production and stimulating the introduction of resource-saving and environmentally friendly production technologies;

- the formation and development of large-scale specialized zones for the production of the main types of agricultural products, the elimination of various barriers and administrative restrictions on the movement of agricultural products, raw materials and food within the country.

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MANAGEMENT ACCOUNTING IN THE RESTAURANT BUSINESS: ORGANIZATION METHODOLOGY

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Abstract. A functionally developed management accounting focused on the competitive environment will make it possible to identify information and technological processes that are a priori oriented towards the adoption of reasonable and optimal management decisions that allow timely elimination of deficiencies characteristic of accounting and financial accounting. The effectiveness of managerial control leads to the guarantee of reliable information of accounting (financial) statements, reliability, stability and security of the organization's assets, allows you to explore the relationship of management and tax accounting, thereby contributing to successful and profitable activities. In this regard, the development of theoretical and practical recommendations, which are aimed at strengthening the role and importance of management accounting, improving the methodology of its organization in the restaurant business, is becoming very relevant. The purpose of the study is to develop the theoretical and methodological aspects of management accounting of catering enterprises, in particular restaurant services. The theoretical basis of the study was the work of foreign and domestic scientists on the formation, management and use of organization resources, management of socio-economic systems in the field of public catering. The research information base was made up of legislative and other regulatory acts of the Republic of Kazakhstan, statistical data of the Agency of the Republic of Kazakhstan on statistics, analytical materials, materials of scientific economic literature and periodicals, materials of scientific and practical conferences, electronic resources. In the research process, both general scientific methods of cognition were used: methods of induction and deduction, analysis and synthesis, classification and grouping, as well as special ones: methods of situational, comparative and economic-statistical analysis, methods of expert analytical, balance sheet and strategic analysis.

Keywords: catering; management; forecasting; management accounting; costing; restaurant business.

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JEL Classifications: M10, M11, M21

1. Introduction

Today, without further integration of supply management and overall business management, it is impossible to imagine effective management and, accordingly, the future of the company. Each organization has its own management system and management structure, with the help of which a management strategy, tactics and further vision of the company are developed.

For the normal execution of management functions, each manager needs information that forms the accounting system. It is in the accounting system that the facts of economic activity are reflected and talk about the effectiveness of management decisions made. That part of the accounting system that provides information to management personnel is called management accounting (Drury 2003; Paiva & Carvalho, 2018; Pustylnick et al., 2017).

The information provided by management accounting is focused on the needs that are associated with strategic and tactical management, the efficient use of hired resources of the company, an objective assessment of structural units and individual managers, that is, management accounting is the main part of the management process and provides information important for:
- determining the strategy and planning for future operations of the company;
- control of its current activities;
- optimization of resource use;
- assessment of performance;
- reducing the level of subjectivity in the decision-making process.

Management accounting in its nature and content is intended to serve the interests of the enterprise and in every possible way to promote effective methods of enterprise management.

Based on the analysis of existing approaches to the definition of the concept of "management accounting", the author concluded that in the modern theory of accounting management accounting there are various approaches to the definition and composition of elements of the management accounting system. However, each of them solves its local problem and does not ensure the implementation of the whole complex of user requests, which leads to a decrease in the quality of management.

It is important to note that the role of the management accounting system in any company is very large. The implementation of this system is necessary for the leader, managers and all staff, because the importance of the correctness of management accounting provides information that is necessary to enhance attention and prioritize the organization's tasks aimed at planning and predicting its future activities.

2. Literature review

In his publications Botobekov A.B., describes management accounting, which has a number of features:
- firstly, management accounting cannot be abstracted from technology, technology and from industry specifics of production, study and analysis of demand and supply in the market, methods of economic statistics, development of the social sphere, etc.;
- secondly, the features and criteria of management accounting are its suitability. If the information obtained through management accounting is suitable, then management accounting is considered useful. Therefore, in the management accounting system, great emphasis is placed on logic and experience. Based on them, employees of accounting services carry out effective business accounting and control in the interests of the enterprise itself;
- thirdly, management accounting is designed to serve the interests of the labor collective. The advantage of management accounting over production accounting is that it finds its application in practice (Botobekov 2010; Boyko and Derun, 2016; Král and Šoljaková, 2016; Derun and Mysaka, 2018).

Egorova L.I. describes modern management accounting as a type of activity within the framework of one organization, which provides the organization's administrative apparatus with the information used for planning, managing and monitoring the organization's activities. This process usually involves the identification, collection, measurement, analysis, interpretation, preparation, transmission and reception of information necessary for the

management apparatus to perform its functions (Yegorova 2008; Isniawati et al., 2018; Hilkevics, Semakina 2019).

Some specialists in the field of management and financial accounting (in particular, O.E. Nikolaeva, T.V. Shishkova) believe that management accounting is a subsystem of accounting, therefore its information base is connected with the operational area of activity.

A number of scientists associate management accounting with an integrated accounting system, which includes planning, control and analysis, the information base can be used to make tactical, predictive and strategic decisions (Romanov 2016).

Garifulin K.M. examining management accounting in his work notes that today in the domestic practice of applying management accounting secondary sources of information are used, which in a certain way reduces its effectiveness. For example, management accounting has practically no effect on the process of organizing jobs and production and technological processes, although their planning, according to experts, could really increase the efficiency indicators by at least 15-30%, and the management of innovative activities by all 50 –70% (Garifulin 2016).

According to the studies of Vakhrushina M.A., monitoring of the levels of managerial accounting and control on legal regulation showed that currently there are no unified approaches to this issue. But the general opinion is that both scientists and practitioners have to use normative acts in the field of accounting as a base (Vakhrushina 2013).

In his research, Davison J. claims and proves that in order to choose one or another calculation method, the company management must present the specifics of each of them and the result that can be obtained by their application, and which will affect the financial result of the work of the whole company (Davison 2015).

A. Sh. Margulis in his work also considers the cost accounting method and the costing method as a single process of studying the costs of certain types of enterprises for the production and sale of products from the standpoint of measuring, controlling, determining the cost of products and works; he notes that "the artificial separation of calculation methods from cost accounting methods leads to the technicalization of processes for calculating production costs and does not follow from the economic nature of cost accounting methods" (Margulis 1980).

Thus, management accounting is a system that provides management personnel with information that is used for planning, evaluation, regulation and control of the company (Horngren & Foster & Datar 2007).

According to Harrison R., the development and application of effective managerial decisions will serve as a fundamental prerequisite for a company's competitiveness in the market and the implementation of a clearly defined personnel policy (Harrison 2014).

3. Methodology

The effectiveness of the functioning of commercial organizations in various industries, including in the restaurant business, depends to a large extent on the economic mechanism adequate to modern economic conditions, of which management is an integral part. The enterprise management system is implemented through such functions as accounting, planning, rationing, organization and control of production activities.

To increase the efficiency of the management system in restaurant complexes, it is necessary to receive timely

detailed information about the processes and results of economic activity, which is traditionally formed in the management accounting system.

Based on the analysis of the industry specifics of the restaurant business, the main features of the technology and organization of production and the nature of their influence on the specifics of the organization of management accounting at enterprises in this industry were identified (Table 1).

Table 1. The main features of the technology and organization of production and the nature of their influence on the specifics of the organization of management accounting

№	Features of the restaurant business	Management accounting elements
1	Strict adherence to production technology (formulations) and consumption rates for various types of basic and auxiliary materials	Costing Objects
		Responsibility Centers
		Budgeting scheme
		Working chart of accounts
		Reporting Forms
2	Dependence of the composition of costs on the collection of formulations and organization of the production process	Costing Objects
		Responsibility Centers
		Budgeting scheme
		Working chart of accounts
3	The presence of a wide range of products and the need for daily refinement of production plans	Responsibility Centers
		Budgeting scheme
4	The possibility of using raw materials and finished products in personal subsidiary plots	Responsibility Centers
		Budgeting scheme
		Analysis technique
5	Limited shelf life and product sales	Responsibility Centers
		Reporting Forms
6	Using a discount system depending on the volume of purchases, distance, delivery and other factors	Reporting Forms
		Analysis technique

Source: compiled by authors

Justifying the relationship between the elements of management accounting and the specifics of the activities of public catering enterprises, in particular, the restaurant business, when forming a budgeting scheme, the separation of fixed and variable costs is also carried out taking into account the specifics of the organization of production at enterprises of this type of service.

For example, in contrast to traditional approaches to the separation of costs into fixed and variable, fixed costs in this industry include the costs of energy and fuel for technological purposes, which are independent of the volume of baked products, since the baking time and temperature regime remain unchanged at any load of the furnac. The budgeting of direct labor costs is affected by such a feature of the industry as the use of a piece-rate brigade wage system for the main production personnel. Currently, in many restaurant business enterprises there are no norms for the complexity of the product in standard hours, and wages are calculated at piece rates per unit of finished products established by the organization.

As a feature of this industry, it is necessary to note a limited shelf life of products, therefore responsibility centers should reflect information on product balances in the developed reporting forms in order to prevent the formation of significant residues of finished products in warehouses.

Today, when the company's ability to optimize internal resources has become the key to business preservation, its own employees are becoming significant capital, and in-house marketing and in-house strategic management and properly structured management accounting are of particular importance.

It should be noted that the catering market is very diverse and promising, as more and more modern companies consider it necessary to provide their staff with hot, nutritious meals during working hours. The market potential is evidenced, in particular, by the fact that only about 30% of Kazakhstan companies today outsource the organization of catering, while, for example, in the USA this figure is 97%.

On the number of catering enterprises for the period from 2006-2017. The following data attest (Figure 1) (Data of the Agency of the Republic of Kazakhstan on statistics for the period from 2006-2017).
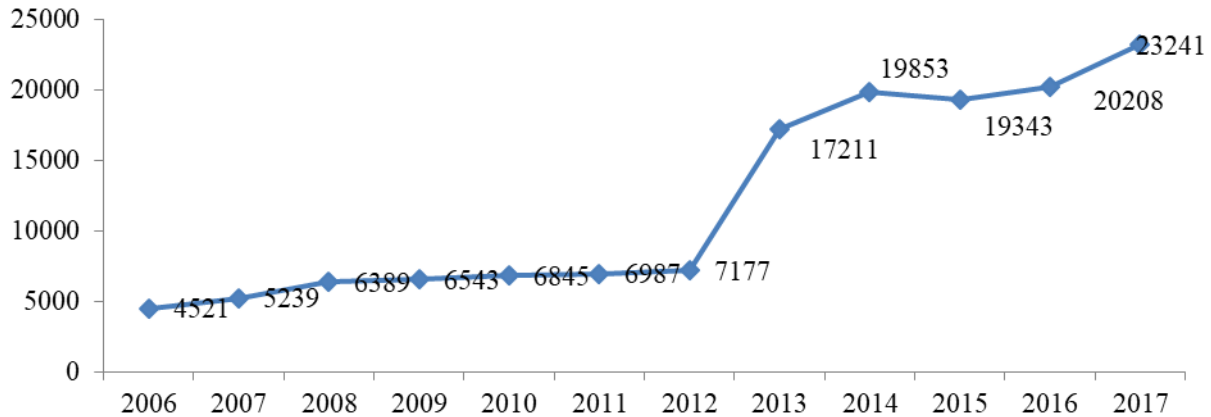

Figure 1. The number of catering enterprises in 2006-2017.
Source: compiled by authors based on the data of the Agency of the Republic of Kazakhstan on statistics for the period from 2006-2017.

Speaking about the public catering market in Kazakhstan, I would like to note that changes in the total volume of the market for food and beverage services (catering) in the Republic of Kazakhstan for the period from 2006 to 2017 show a pronounced positive trend.

To determine the predicted value of the growth of public catering enterprises in Kazakhstan, an exponential trend model is best suited. The results of data approximation are presented in Figure 2 (Sedelev 2009).
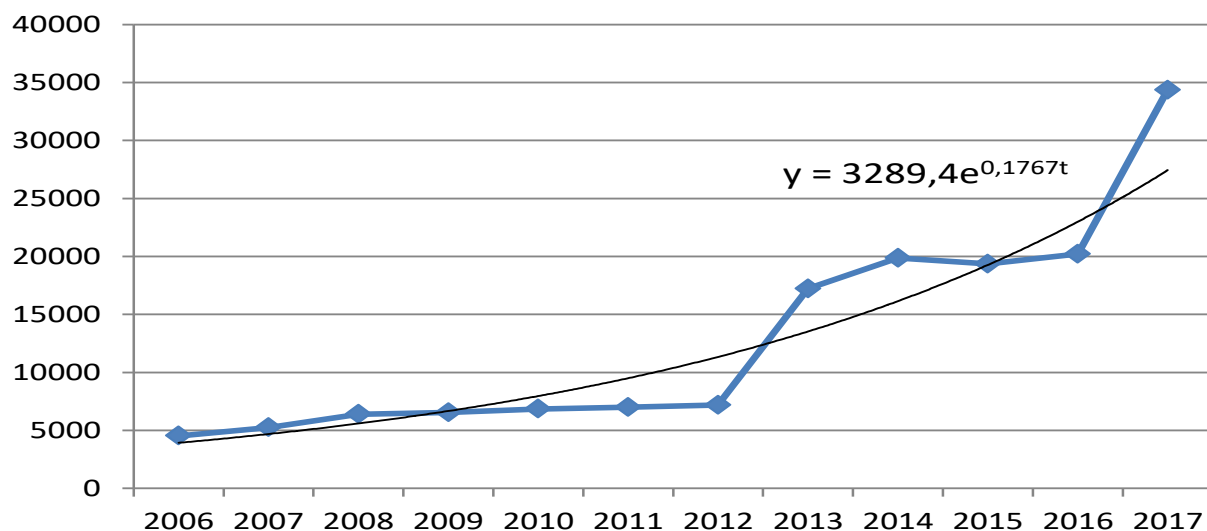

$$y = 3289,4e^{0,1767t}$$

Figure 2. Trending model.
Source: compiled by authors according to the source Sedelev (2009)

Using the obtained trend model, we determine the predicted values of the number of catering enterprises for 2018-2021 (Table 2).

Table 2. Forecast calculation

Year	t	Number of enterprises
2018	13	32710,09
2019	14	39032,07
2020	15	46575,92
2021	16	55577,78

Source: compiled by authors

Based on the calculations, a dynamics was built that shows that by 2021 there will be an increase in the number of catering enterprises in the restaurant business in Kazakhstan (Figure 3) (Yemelina & Kozlova).
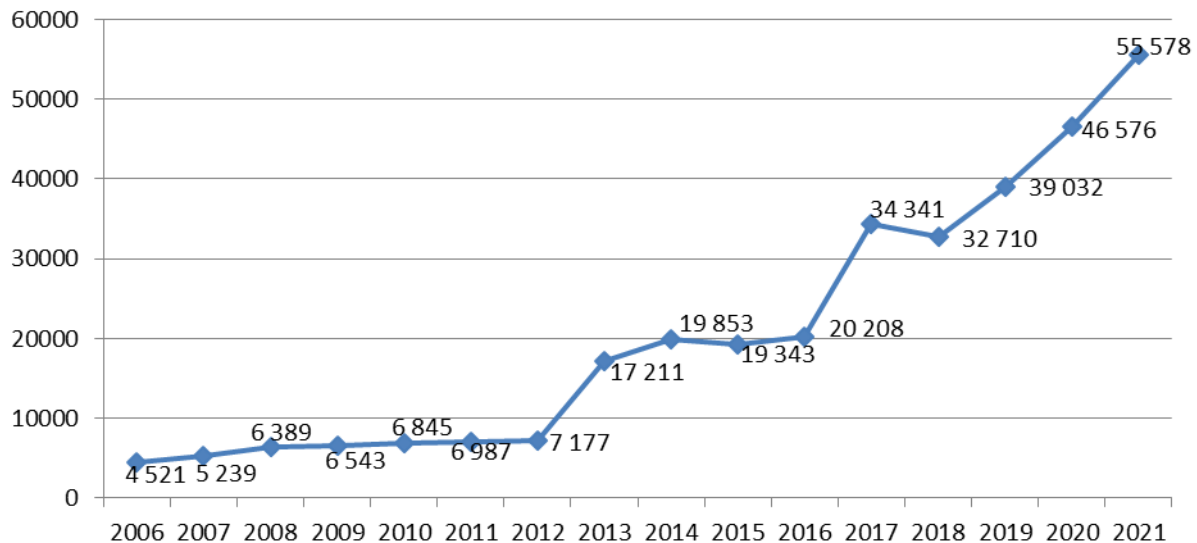

Figure 3. The forecast for the growth in the number of catering enterprises in the restaurant business in Kazakhstan by 2021.
Source: compiled by authors according to the source Yemelina & Kozlova 2017

The following is a change in the size of the market for catering services in the Republic of Kazakhstan for 2006-2017 (Data from the marketing company "IMSR Elim" as of 2017).
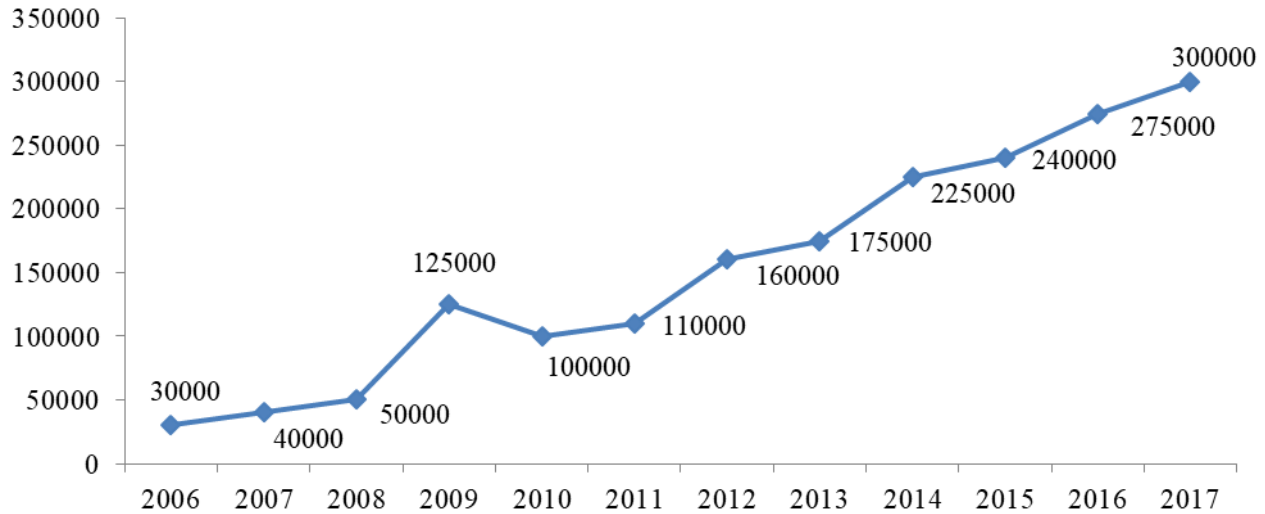
Figure 4. Changes in the volume of the market for catering services in the Republic of Kazakhstan for 2006-2017.
Source: compiled by authors according to the data from the marketing company IMSR Elim as of 2017.

Characterizing the applied forecasting method, it can be noted that the forecast values obtained on its basis coincide with the development trend reflected by the simple extrapolation method. However, the forecast obtained only on the basis of the time series, by the method of simple extrapolation, without any a priori information, it is recommended to develop for sufficiently long periods of studying the economic process in order to identify patterns in the change in the process under consideration, i.e. not for the factor attribute given in table 3.

Table 3. The number of catering enterprises in 2006-2017

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Quantity	4521	5239	6389	6543	6845	6987	7177	17211	19853	19343	20208	23241

Source: compiled by authors

If the coefficients of the equation describing the trend remained unchanged in the time interval under study, then the least squares method would be completely justified for constructing a forecast model. However, often during the analyzed period, these coefficients change in time. For short time series, capturing such changes is extremely difficult. In such a situation, the application of the least squares method to determine the parameters of the forecast model can lead to significant errors.

All levels of observation must be analyzed, but earlier observations are given less weight than later ones. It is precisely these principles that the method of exponential smoothing developed by R. Brown meets. The essence of the method of exponential smoothing is that the time series is smoothed using a weighted moving average, in which the weights obey the exponential law, i.e. this average can serve as an estimate and current correction of the mathematical expectation of the process. A weighted moving average with exponentially distributed weights characterizes the value of the process at the end of the smoothing interval, being the average characteristic of the last levels of the series. It is this property that is used in forecasting. Based on the existing inertia of economic processes, as a result of which the process in the forecast period proceeds under approximately the same conditions as in the analyzed period, such a weighted moving average can be a very effective tool for developing forecasts.

The time series forecasting scheme by the method of exponential smoothing, thus, consists of the following steps.
1. The type of the exponential smoothing model is selected.
2. The parameter α is determined by the formula: $\qquad \alpha = \dfrac{2}{m+1}$ $\qquad$ (1)

either asked by the researcher.
3. The initial conditions are calculated.
4. Exponential averages are calculated.
5. Estimates of the coefficients of the forecast model are determined.
6. A forecast is made one point forward.
7. The deviation of the actual value of the time series from the predicted one is found.
8. According to the recurrence formula:

$$S_t^{[k]}(y) = \alpha\, S_t^{[k-1]}(y) + (1-\alpha)\, S_{t-1}^{[k]}(y) \qquad (2)$$

new exponential averages are calculated, and according to them, the estimation of the coefficients of the forecast model is determined.
9. A forecast is made two points ahead, and so on.

To build forecast models, the formulas were used:
Model Type: Linear

$$y_t = a_0 + a_1 t + \varepsilon_t$$
$$(3)$$

Initial conditions:

$$S_0^{[1]}(y) = a_0 - \frac{1-\alpha}{\alpha} a_1 \qquad\qquad S_0^{[2]}(y) = a_0 - \frac{2(1-\alpha)}{\alpha} a_1 \quad (4)$$

Exponential averages:

$$S_t^{[1]}(y) = \alpha\, y_t + (1-\alpha)\, S_{t-1}^{[1]}(y)$$
$$S_t^{[2]}(y) = \alpha\, S_t^{[1]}(y) + (1-\alpha)\, S_{t-1}^{[2]}(y) \qquad (5)$$

Ratio Rating:

$$\hat{a_0} = 2 S_t^{[1]}(y) - S_t^{[2]}(y) \qquad\qquad \hat{a_1} = \frac{\alpha}{1-\alpha}[S_t^{[1]}(y) - S_t^{[2]}(y)] \quad (6)$$

Forecast Model:

$$y_{t+l}^{*} = \hat{a_0} + l\,\hat{a_1} \qquad (7)$$

Forecast Errors:

$$\sigma^{*}_{y_{t+l}} = \sigma_{\varepsilon_t}\sqrt{\frac{\alpha}{(2-\alpha)^3}[1+4(1-\alpha)^2+2\alpha(4-3\alpha)l+2\alpha^2 l^2]} \qquad (8)$$

The boundaries of the interval in which 95% of the possible values of Y will be concentrated with an unlimited number of observations and

$t = 1 \ (a + bt_p \pm \varepsilon)$

where $\quad \varepsilon = t_{crit}S_y\sqrt{\dfrac{1}{n}+\dfrac{(\bar{t}-t_p)^2}{\Sigma(\bar{t}-t_p)^2}} \qquad\qquad (9)$

As a smoothing interval for calculating the parameter α, we take a three-year period. Hence, the value α calculated by the formula is 0.3.
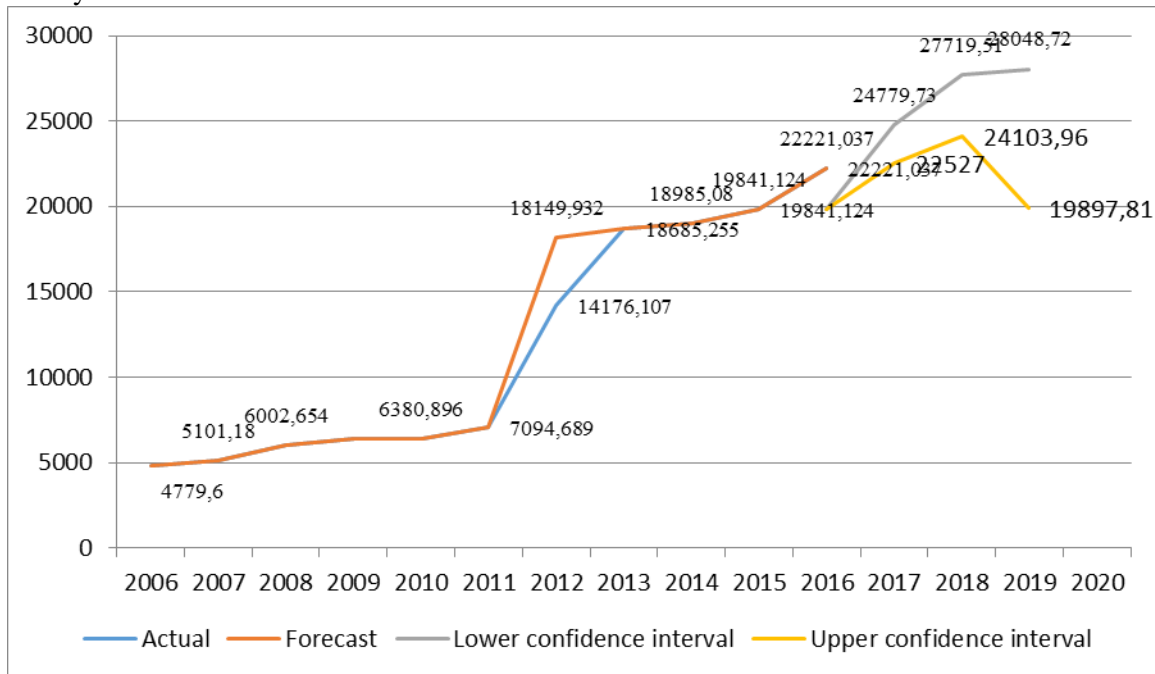
Figure 5. Estimated forecast graph.
Source: compiled by authors

Table 4. Forecast values of the developed forecast model

Indicator	Forecast		
	2018	2019	2020
Number of catering enterprises, units	22527,0	24103,9	23973,3
The equation of the model:	Y = (1-0,3) t + 6972,3		
Determination coefficient R^2	0,852		
Standard error of the equation	2912,216		
F statistics	57,719		

Source: compiled by authors

Based on the study, we see that every year there is an increase in the number of enterprises engaged in the restaurant business. This indicator indicates that the number of catering enterprises is more influenced by the factor in the volume of the market for catering services than the average per capita cash income of the population.

Restaurants constitute a special group of catering enterprises. According to the degree of comfort, level of service and the volume of services provided, restaurants are divided into three classes: luxury, highest and first, which determines the amount of necessary capital costs when creating a restaurant (Aminov & Sadykova 2016). In this regard, the restaurant business is characterized the fact that at the stage of establishment of the institution, the amount of necessary investments and future operating expenses directly depends on the strategic choice of the owner for a set of specific characteristics of the institution (Denisov & Landau 2017).

For the segmentation of management information regarding the relationship between management decisions of the strategic choice of restaurant development areas and the level of reimbursement of operating and investment costs in the process of its operation, it is proposed to use the mechanism of stepwise calculation of total costs. This mechanism consists in grouping costs that are relevant to the level of strategic choice and determining the appropriate target and actual indicators of marginal income (Gorynina & Prostova & Sosnina 2017).

At the first stage, it is necessary to carry out:
1) analysis of the restaurant's revenue generating factors (by indicators: number of seats for guests, number of revolutions of 1 seat for guests per day, average length of stay of 1 guest in a restaurant, average check for 1 guest);
2) determine the target level of revenue per year or quarter.

The next step is the grouping of costs by the levels of strategic choice and determining the amount of expenses for 1 year (quarter). The first level of strategic choice is the choice of a restaurant class. For this strategic choice, it is necessary to analyze the location of the institution, staff and technical equipment. The values for these indicators are calculated for 1 year (quarter) of the restaurant based on the standard period for covering capital costs (Ryabchukova 2017).

With production and car potential, companies must follow a course aimed at the competitiveness of restaurant services and the most complete customer satisfaction. For this it is necessary to implement policies and strategic development aimed at the main areas (Figure 6) (Burmenko & Danilenko & Turenko 2014).
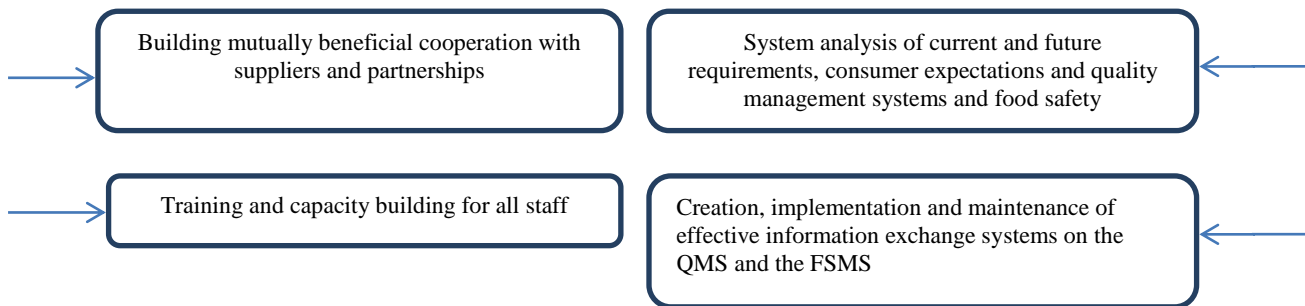

1551
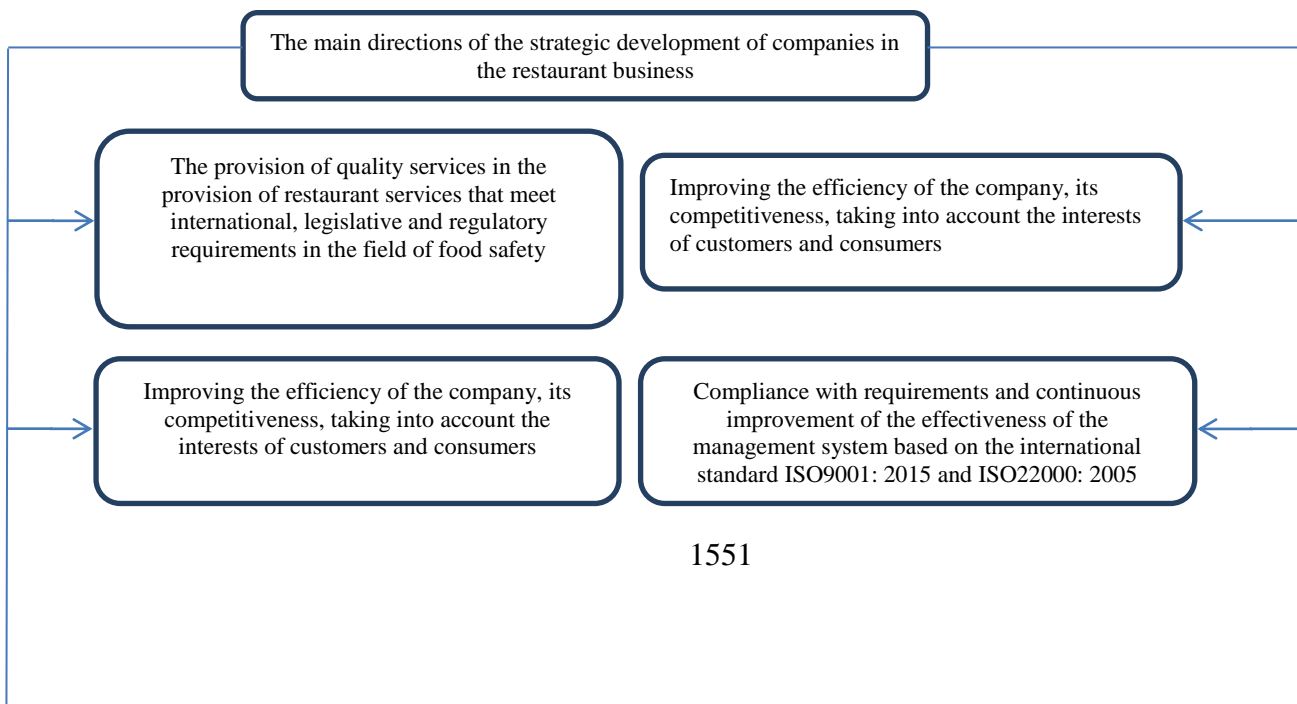
Figure 5. Strategic development of restaurant business management.
Source: compiled by authors according to the source Burmenko & Danilenko & Turenko (2014)

In this regard, there are market requirements for the restaurant business, which are:
- uninterrupted provision of services;
- providing projects with qualified personnel;
- a wide range of dishes on the menu;
- variability of the menu;
- bilateral quality control of products and services (customer / contractor);
- the presence of a corporate style of the food operator.

Conclusions

The restaurant business is one of the few activities that became popular in ancient times, despite the rapid development, this activity has not lost popularity to this day. For two centuries, experts have been studying the problems of identifying success factors in the restaurant business. The relevance of this topic is not lost in our time.

The desire to control the state of the business is a modern trend for managers and owners of large networks and holdings. It gives the right to the existence of various management and analysis tools. The desire for a real assessment of the financial component of any business leads to the need for an additional type of accounting at the enterprise - management accounting.

The direction of the study is very relevant in modern conditions, because when evaluating the work of public catering enterprises, it is important to realize that the restaurant business is different from all other types of business. This enterprise combines art and traditions, mechanisms of activity and the experience of marketers, a service philosophy and the concept of building a potential audience. From year to year, the restaurant business is developing rapidly. Competition for visitors is getting tougher. It is this factor that directs managers to think out not only the main strategy of the restaurant, but also the details that will give the institution a uniqueness and originality.

Modern management accounting in the restaurant business is, on the one hand, an already established comprehensive accounting model that does not have a dynamic development. However, on the other hand, its intensive introduction in the organization of various forms of organization and industry affiliation is observed. And this process requires a deep study of the developed methods of management accounting and rethinking the practical experience of their application (Lebedeva 2016).

Based on the foregoing, the author came to the following conclusions that must be used in the management accounting of public catering enterprises:
- the formation of an adequate system of indicators, in accordance with which to use the classification of income and expenses, taking into account the specifics of the organization of the restaurant or cafe;
- formation of a management chart of accounts, reflecting the features of accounting at public catering enterprises;
- a clear definition of all areas of cash flows by areas of activity;
- the creation of the so-called operations log for management accounting purposes;
- the creation of summary analytical tables having a sufficiently universal character to make it possible to use them for a number of reporting periods;
- generation of reports on cash flow directions and profit and loss.

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MAJOR SOURCES OF FINANCING INVESTMENT PROJECTS

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Abstract. The article describes the main sources of financing investment projects of small and medium-sized businesses (hereinafter referred to as SMEs). Through the Desk Research method, the analysis of the main indicators of SME development, ways of financing SMEs is carried out. Based on regressive multivariate data analysis and the use of a technical analysis tool, a forecast of the number of people employed in SMEs, the share of GVA in the country's GDP, the share of loans to small businesses, and investments in fixed assets are calculated.

1. Introduction

The development of SMEs is one of the strategic objectives of the country, contributing to the promotion of a competitive environment with the prospect of introducing new methods and efficient technologies at enterprises, raising the level of labor productivity, and applying high technologies. In addition to a significant economic role, SME development also plays a social role through the stability of the middle stratum of the population, the

creation of new jobs, and the reduction of unemployment and poverty (Kowo, et al. 2019; Baltgailis 2019; Azam et al., 2016; Peković, 2017; Bhukuth et al., 2018).

In the Republic of Kazakhstan, the average annual increase in the number of active SMEs over the past 5 years was 2.4%, the number of people employed in SMEs was 2%, output was 13.2%, and the share in GRP was 5% (Statistics Committee).

2. Research background

There is a slight annual increase for 2013-2017, number of registered SMEs in the amount of 0.03%. Table 1 shows the main indicators of the development of SMEs in Kazakhstan for the period 2013-2017.

Table 1. Main indicators of SME development in the Republic of Kazakhstan for the period 2013-2017

	2013	2015	2017	Growth 2015 /2013, in %	Growth 2017 /2015, in %	Growth 2017 /2013, in %	Medium annual growth behind 2017/ 2013г, in %
The number of registered SMEs, in thousands units	1 535,9	1 481,4	1 540,5	-3,5	3,9	0,3	0,03
The number of active SMEs, in thousands units	888,2	1 242,5	1 145,9	39,8	-7,7	29,0	2,4
Number of people employed in SMEs, in thousand people	2 576,9	3 183,8	3 190,1	23,5	0,20	23,7	2,0
Output, in billion tenge	9 165,4	15 699,4	23 241,1	71,3	48,0	158,6	13,2
Share in GDP, in %	16,7	24,9	26,8	49,1	7,6	60,4	5,0

Source: compiled by authors according to Committee of Statistics of the Ministry of National Economy http://www.stat.kz

Based on the data of the Committee on Statistics of the MNE RK, a trend line was built for the period 2005-2017. (Figure 1), showing the trend of the relationship between the number of people employed in SMEs and the share of GVA of SMEs in a country's GDP. The magnitude of the reliability of the R2 approximation is defined as the square of the correlation coefficient between the level of the dynamic series and time and characterizes the fraction of the variation of the level of the dynamic series, explained by the influence of time. The closer R2 is to 1, the more significant is the trend equation (JSC Damu).
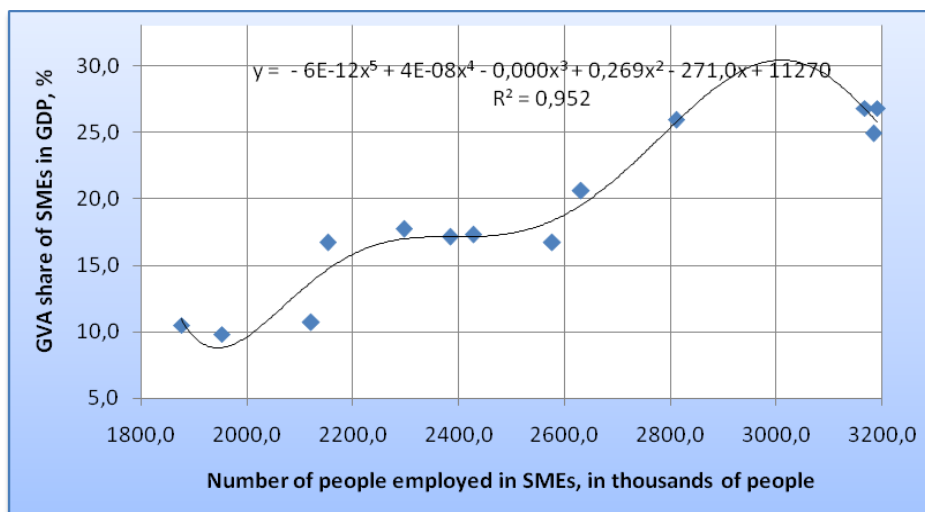
Figure 1. Diagram of the impact of employment in SMEs on the share of GVA in GDP
Source: compiled by the authors on the basis of technical analysis

The scatterplot revealed obvious outliers, while the confidence coefficient of the approximation is higher than the optimal value $R2 = 0.9525 > 0.7$. In view of this, we consider this factor significant. The greater the number of people employed in SMEs, the greater the country's GDP indicators. Prediction in such a model is possible and we see that the point forecast, at first glance, is reliable, since the coefficient of confidence of the approximation is equal to 0.9525. The polynomial equation for the dependence of the GVA share in GDP on the number of people employed in SMEs is described by the function: $y = 4E\text{-}16x^6 - 6E\text{-}12x^5 + 4E\text{-}08x^4 - 0.0001x^3 + 0.2692x^2 - 271.05x + 112701$.

The forecast values of the number of people employed in SMEs and the share of GVA of SMEs in GDP are given in Table 2, built on the basis of a linear trend line.

Table 2. Forecast of main indicators of SME development

Indicator	2018	2019	2020	2021	2022
Number of people employed in SMEs, in thousand people	3 302,6	3 415,5	3 528,4	3 641,3	3 754,2
Share in GDP, in %	28,3	29,8	31,2	32,6	34

Source: compiled by authors according to technical analysis

Based on a technical analysis, a forecast was made of the impact of the number of people employed in SMEs on the share of GVA in GDP (Figure 2).
According to the forecast, the share of the contribution of SMEs to GDP in Kazakhstan in 2022 will be 34%. As compared with developed countries, such as, USA-52%, Germany-55%, France -50%, Denmark-61%, Italy-68%, this figure is quite low.
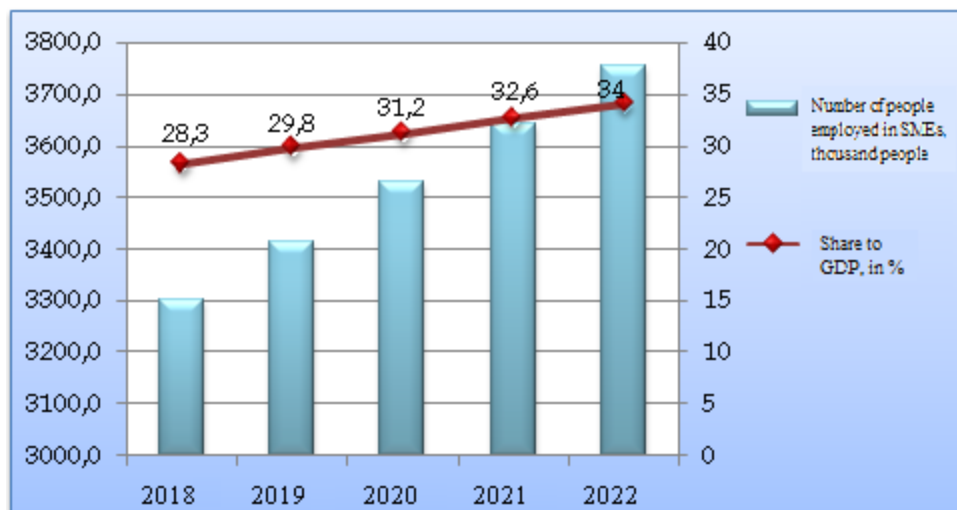
Figure 2. Forecast of the impact of employment in SMEs on the share of GVA in GDP
Source: compiled by authors according to technical analysis

Nevertheless, one of the main objectives of the strategic development plan of Kazakhstan is to achieve 50% of the contribution of enterprises to the country's GDP. To fulfill this task, the state is taking measures to expand and improve government programs to support SME entrepreneurship. One of the main external sources of financing for SMEs is credit financing.

Credit financing is a monetary resource issued by financial institutions on certain conditions (creditworthiness, urgency, solvency) for a certain period.

The creditworthiness of the borrower of an investment project is the ability to accumulate cash flow as a repayment of the loan provided for investment projects based on the basic necessary criteria in terms of assessing the risks and income necessary for a bank to make an effective decision on a project.
In the dynamics of credit financing by second-tier banks, small entrepreneurship can see an average annual growth rate for 2012-2017. amounted to 13.8%, and there is also an increase in the share of credit funds with an average annual growth of 4.2% in the total amount issued in the country's economy. Table 3 shows the dynamics of credit financing for second-tier banks.

Table 3. Dynamics of credit financing of STB

Indicator	2012	2013	2014	2015	2016	2017
Loans issued in the economy, in billion tenge	7 249	8 348	10 599	9 351	9 833	12 705
Credits issued to small businesses, in billion tenge	1 050	890	1 198	1 279	1 984	2 789
Share of loans to small businesses, in %	14,5	10,7	11,3	13,7	20,2	21,9

Source: compiled by authors according to Committee of Statistics of the Ministry of National Economy, http://www.stat.kz

Based on the dynamics of actual indicators of loans issued to small businesses in the total volume of loans issued to the economy, as well as applying technical analysis based on an exponential and linear trend line, we will predict the dynamics of loan financing until 2023.

For the indicator "loans issued to the economy" a model of the logarithmic trend line was chosen. The logarithmic trend of the level of the dynamics of loans issued to the economy is presented in Figure 3.
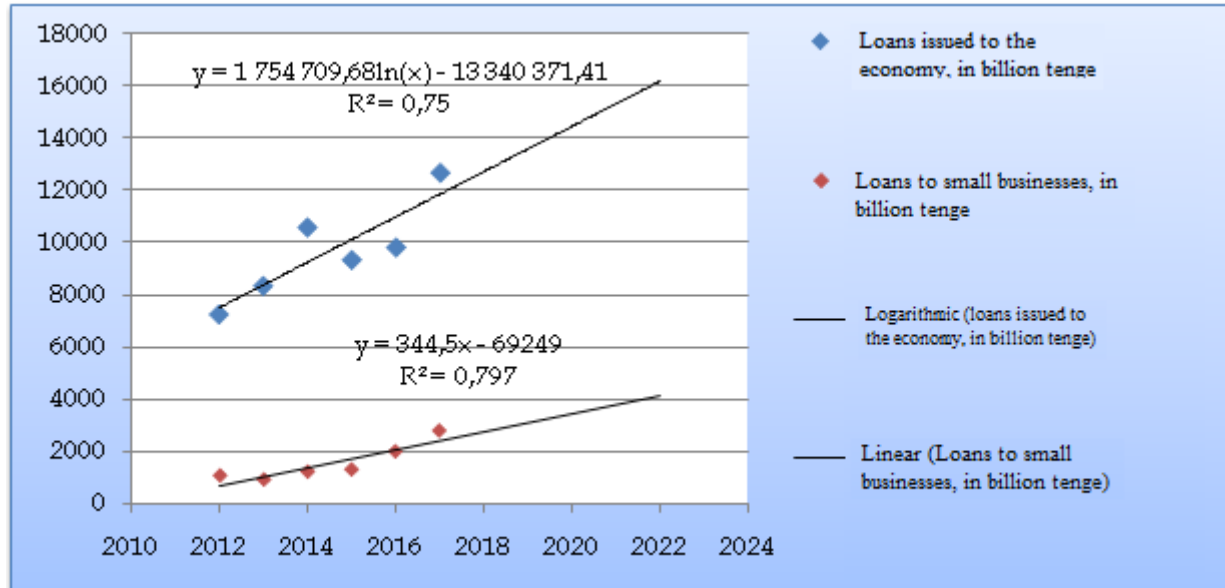
Figure 3. Forecast of the dynamics of loan financing, billion tenge
Source: compiled by authors according to technical analysis

3. Results

The analysis of this graph shows that the dynamic range model, chosen as a logarithmic trend, in principle adequately describes the real process, the approximation reliability coefficient is 0.75. Prediction in such a model is possible and we see that the point forecast, at first glance, is reliable.

The logarithmic calculation of the forecast indicator "loans issued to the economy" is represented by the following equation:

$$y = 1\,754709,68 Ln(x) - 13\,340371,38 \text{ (1.1)},$$

where:
y - predicted value of the indicator;
x – actual values of the indicator;

For the indicator "loans issued to small businesses," the optimal model is a linear trend with an approximation coefficient of 0.7975. Linear calculation of the forecast indicator "loans issued to small businesses" is described by the function:

$$y = 344,51x - 692492 \text{ (1.2)}$$

where:
y - predicted value of the indicator;
x – actual values of the indicator.

The results of the forecast indicators of loan financing are presented in Table 4.

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Table 4. Forecast of loan financing indicators

Indicator	2018	2019	2020	2021	2022
Credits issued to the economy, in billion tenge	12 727	13 597	14 466	15 334	16 202
Credits issued to small businesses, in billion tenge	2 729	3 074	3 418	3 763	4 107
The share of loans to small businesses, in %	21,4	22,6	23,6	24,5	25,3

Source: compiled by the authors on the basis of technical analysis

Thus, by 2022, the share of loans to small businesses will be 25.3% of the total loans issued to the economy.

One of the main financial funds to support entrepreneurship is JSC Damu Entrepreneurship Development Fund, which provides financial and non-financial support to SMEs through state programs for both start-up entrepreneurs and operating ones. Loan financing is carried out through certain second-tier banks and leasing companies that are partners of the Fund.

To determine the effectiveness of government programs to support entrepreneurship, we consider the dynamics of the main indicators for the period 2012/2017 (Table 5).

Table 5. Results of credit financing within the framework of state programs under JSC Damu Entrepreneurship Development Fund

	2012	2013	2014	2015	2016	2017
Number of investment projects, in units	3 560	3 762	5 531	6 186	13 217	11 936
Amount of loan financing, in mln. tenge	331 079	295 419	439 400	523 700	606 000	548 490
Production output of SMEs, in billion tenge	8 012	9 165	14 605	15 699	16 857	21 148

Source: compiled by the authors based on the annual reports of JSC "Entrepreneurship Development Fund" Damu

The above table clearly demonstrates the steady growth of investment projects by 29.8% from 2012. At the same time, the indicators of loan financing are also growing, the average annual increase is 3.3%.

In contrast to loan financing, a venture has several features. According to the terminology Krapivina E.S., a venture fund is an investment fund that is focused on working with innovative enterprises and projects, often start-ups (Krapivina 2014; Kozubíková et al., 2017). Venture financing is a risky activity aimed at the use of scientific advances and technical (technological) innovations that have not yet been used in practice. In the entrepreneurial code of the Republic of Kazakhstan, venture financing refers to activities related to financing persons engaged only in innovative activities, by investing in their authorized capital, acquiring financial instruments issued by them or providing them with a cash loan (Entrepreneurial code).

Thus, venture financing differs in many ways from credit financing. The main differences are the obligatory presence of the innovation component in the investment project, the possibility of attracting funding without providing collateral. Participants in venture financing can be enterprises that are in the early stages of development, as well as existing enterprises that are planning to expand or modernize production (Baranowska-Prokop & Sikora, 2017; Cichy & Gradoń, 2016). The conditions for providing financing are made on the terms of payment of an investment loan over a long-term investment period with an annual interest rate of 15% or more or with the participation of the authorized capital of SMEs, while the calculation of the company's value is determined at the preliminary stage of negotiations.

With the entry into force of the new legislation in the Republic of Kazakhstan on venture financing, the demand for venture financing will increase, due to accessibility and simplification of procedures, as well as the creation of a legal framework. The appearance of an agreement on the exercise of the rights of participants in an economic partnership will make it possible to carry out actions related to the management of the partnership, through

participation in voting at a general meeting of participants. In addition, participants in the partnership may provide for compensation for property losses due to the impossibility of meeting their obligations (Law of the Republic of Kazakhstan 2018). The concept of "venture manager" is introduced, which is engaged in the management of assets of the venture fund under the terms of the contract concluded with it. The opening of the international technology park of IT start-ups "Astana Hub", being a platform in order to attract venture capitalists, business angels, will allow SMEs to develop in high-tech innovation spheres.

The investment portfolio of the main venture capital funds in the Republic of Kazakhstan is presented in Table 6. In compiling the investment portfolio, annual reports for 2017 were used by JSC NATAT, JSC Kazyna Capital Management (Annual report of JSC NATR and JSC Kazyna Capital).

Table 6. Investment portfolio of main venture funds in the Republic of Kazakhstan

№	Name of the direct investment fund	Venture fund	Venture Fund Investments, in million tenge
1	JSC «Areket»	JSC «NATR»	264,6
2	JSC «Delta Tehnology»		1320
3	Wellington Partners Ventures III Technology Fund L.P.		1329
4	Flagship Venture Fund		1281
5	Vertex III Venture Fund		674
6	Aureos Central Asia Fund	JSC «Kazyna Capital Management»	1 961
7	Wolfensohn Capital Partners (WCP)		9 213
8	ADM Kazakhstan Capital Restructuring Fund (KCRF)		18 315
9	Russian – Kazakh Fund of Nanotechnology (RKFN)		9 250
10	Falah Growth Fund (FGF)		18 500
11	Kazakhstan Growth Fund (KGF)		14 800
12	Macquarie Russia and CIS Infrastructure Fund (MRIF)		11 100
13	CITIC-Kazyna Investment Fund I (CKIF)		37 000
14	Almex-Baiterek Fund (ABF)		10 323
15	Islamic Infrastructure Fund (IIF)		1 110
16	Baiterek Venture Fund (BVF)		14 134
17	Kazakhstan Infrastructure Fund (KIF)		37 000
18	DBK Equity Fund C.V.		1 106,3

Source: compiled by the authors based on the annual reports of JSC "Entrepreneurship Development Fund" Damu

Forming a legal framework conducive to resolving relations between venture capital market participants, creating a mechanism for state participation in financing venture funds, through development institutions and national companies, will stimulate an increase in venture capital investments in innovative projects, which will increase the country's GDP indicators in a certain way.

JSC "National Agency for Technological Development" is the main operator of the program for the grant financing of innovative projects. One of the main programs is "Innovation Grants".

Innovation grant - budget funds provided to the subjects of industrial and innovative activities on a grant basis for the implementation of their industrial and innovative projects in the framework of the priority areas for the provision of innovative grants (Concept of innovative development). Since 2017, the program has been amended, namely, the grant limit has been increased to 500 million tenge, requirements for grant recipients have changed regarding the presence of 3–3 years of business experience, as well as their own participation in the project. In addition, the procedure for reviewing and filing an application has been simplified, and the time periods for examination have been reduced.

According to the results of 2017, out of 208 grant applications, 9 inno- vation grants were approved, worth a total of 1,687 billion tenge, 24% of which were directed to technology commercialization, 34% to the technological development of existing enterprises, 42% to the development of industries. In terms of industries, the leading place is occupied by the development of information and communication technologies, then progressive technologies in the agro-industrial complex, the third and fourth places are engineering and advanced technologies in construction.

Thus, the state stimulates the development of innovative entrepreneurship, creating favorable conditions for the introduction of new advanced technologies and innovative solutions.
One of the lending instruments for SMEs is leasing financing. Leasing is a long-term lease of machinery, equipment, vehicles, as well as industrial facilities, that is, a form of investment (Zhuirikov 2017). The main difference between leasing financing and credit is the lack of collateral, instead the security is the registration of the lessor's ownership of the property. Also after payment of all leasing payments, the lessee draws ownership of the acquired assets.

According to Gazman V.D. Leasing should be divided into: financial, operational, leverage-leasing, leaseback (Gazman 2013). The author of another work cites another type of leasing - leasing "in package", a financing system in which buildings and structures are provided on credit, and equipment is given to the lessor under a lease agreement.

According to Zhuirikov K.K. leverage leasing is a financial leasing in which a larger share of the leased asset is leased to a third party (Zhuirikov 2017).

According to the Statistics Committee of the MNE RK, the following types of leasing prevail in the Republic: returnable, full, clean.

Returnable leasing is one of the types of leasing financing, which provides for the sale by the supplier of equipment, equipment, buildings, etc. on the terms of returning this object to leasing as a lessee (Braginets 2013).
Full leasing, in addition to leasing equipment, equipment, buildings, provides technological support, including repair and maintenance services for leasing objects, performed by the lessor (Arystanbaeva 2016).

In the case of net leasing, technological service is performed by the lessee (Adambekova 2014).
The amount of leasing payments received in 2017 amounted to 163,758 million tenge, of which 56% falls on Astana, 41% on Akmola region.

Table 7. The main indicators of financial leasing at the end of 2017

% financial leasing rate	The cost of contracts, in thousand tenge	Quantity, in units
before 10%	67872980	1271
up 10% to 14%	23739913	78
over 14%	132438390	2952

Source: compiled by authors according to Committee of Statistics of the Ministry of National Economy, http://www.stat.kz

One of the factors affecting the development of the leasing market is investment in fixed assets. In the dynamics of 2005/2017 growth of investments in fixed assets amounted to 72.3%, with an annual increase equal to 6%. Applying a technical analysis of forecasting based on a linear trend line, described above, the predictive values of the indicator were calculated. By constructing a scatterplot and trend lines with an approximation confidence factor of $R2 = 0.98$, we obtain the forecast until 2022 (Figure 4) (EBRD 2018).
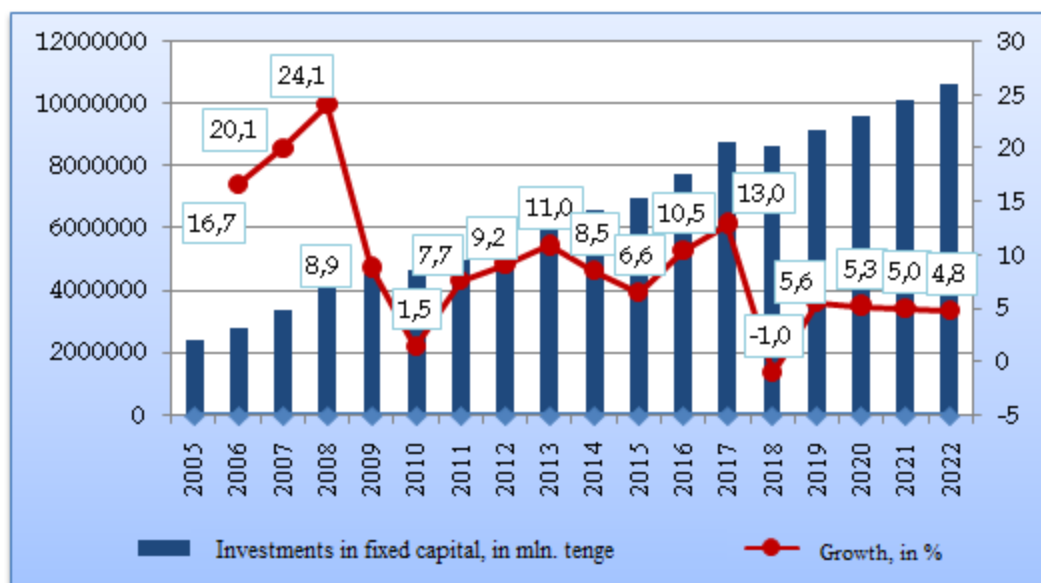
Figure 4. Forecast of investment in fixed capital, in mln. tenge
Source: compiled by the authors on the basis of technical analysis

The average annual increase in investments in fixed assets over the period 2005–2022 will be 28.2%, in physical terms 10,625,700 million tenge.

Another fundamental factor influencing leasing demand is the degree of depreciation of assets of enterprises (Figure 5).
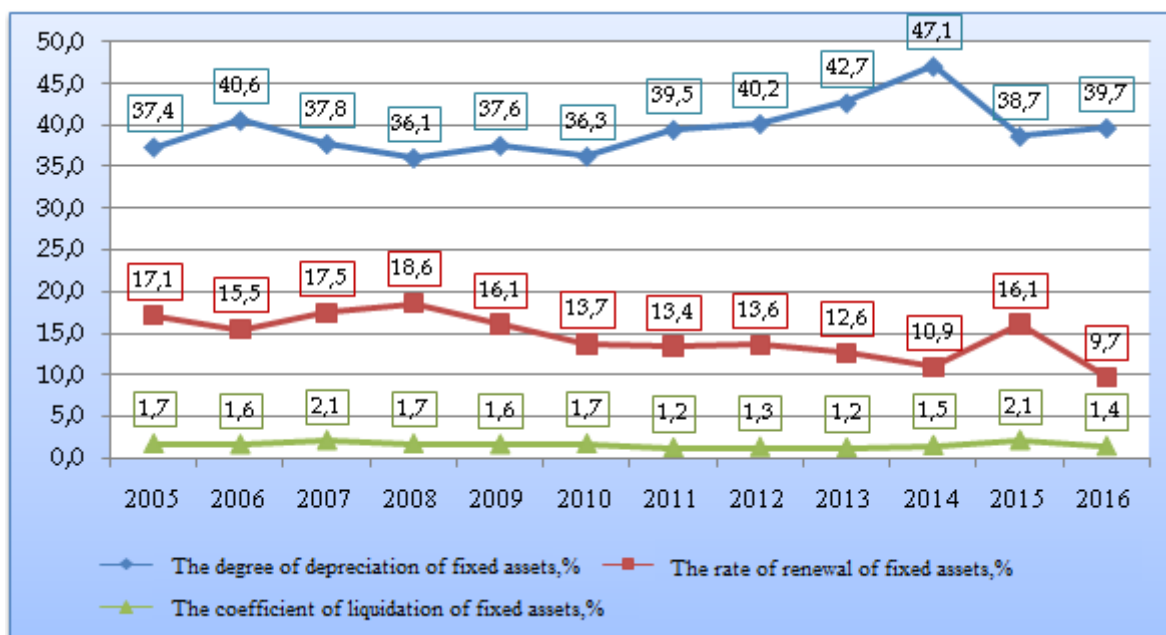
Figure 5. Basic indicators of fixed assets, in %
Source: compiled by the authors on the basis of data from the Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan: http://stat.gov.kz/

In the Republic, the degree of wear at the end of 2016 was 39.7% versus 38.7% a year earlier. The coefficient of liquidation of fixed assets at the same time amounted to only 1.4%, which speaks of asset upgrades and write-offs. Also, according to the Statistics Committee of the MNE RK, the total value of financial leasing contracts for 2017 increased by 34% compared with the previous year and amounted to 224 billion tenge (Doing business 2015).

Thus, in the development trend of leasing financing growth is noted, leasing assets becomes an effective way to update the production capacity of enterprises, due to the decline in the share of credit or equity (Dzhaksybekova 2016).

Conclusions

In addition to traditional methods of attracting funding, there are also modern methods. A striking example is the crowdfunding system of attracting investment (from the English. "Crowd" - group, "funding" - financing), that is, funding from a large number of people.

In Kazakhstan, this type of financing appeared in 2013, however, active work began recently. Submitted by the crowdfunding platforms, provide services to attract funding for the implementation of business ideas from around the world.

In conclusion, we would like to note that the considered sources of external financing are not the only ones, there are many other ways of financing, including various combinations and options for the implementation of investment projects. The country's economic growth is directly dependent on the development of SMEs and on a favorable investment climate. "The development of small and medium business is the main tool of industrial and social modernization of Kazakhstan in the twenty-first century".

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Abstract. The article discusses the current state of small and medium-sized businesses in the country, analyzes the problems hindering its development, presents the author's vision of their solution. The authors explore the sources of financial support for the development of entrepreneurship, the problems of their insufficiency, lack of incentives for implementation. Based on the analysis of business activities in Kazakhstan in recent years, conclusions and recommendations have been formulated for improving the economic instruments for regulating entrepreneurship in Kazakhstan, and a forecast has been given for the further development of SMEs. The policy of industrial-innovative development of the economy does not give the desired result, the innovative component of the products produced still remains at a very low level, the competitiveness of the products produced is at a low level also.

1. Introduction

This is explained by the fact that the country's industrial-innovative policy is carried out without sufficient institutional changes in the business environment, the scientific and educational system, legislation, government and other areas. In order to achieve fundamental modernization and competitiveness, large-scale investments are needed in non-primary industries. Concentration of state and business resources in the breakthrough areas of growth of innovative activity will increase the competitiveness of domestic products, develop new market niches

and accelerate the pace of economic growth. In modern conditions, the functioning of entrepreneurship is of particular importance, ensuring employment of the population, prompt satisfaction of the needs in the production of goods, food and services. In the Message of the President of the Republic of Kazakhstan N.Nazarbayev to the people of Kazakhstan dated January 31, 2017, "The Third Modernization of Kazakhstan: Global Competitiveness" states "The second priority is the cardinal improvement and expansion of the business environment. One of our strategic goals is to ensure by 2050 the contribution of small and medium-sized businesses to the country's GDP of at least 50" (Nazarbayev 2017).

2. Research background

At the same time, the further effective development of small and medium-sized businesses in Kazakhstan is constrained by significant shortcomings of both non-financial and financial nature. The last and most important ones include the insufficient volumes of own sources of financial support, a small share of forms of state financial support and unavailability of crediting.

Turning to the practice of developed countries, it is worth noting that the development of SMEs in foreign countries is proceeding at a faster rate than in Kazakhstan. Today, in the most developed foreign countries, SME companies account for about 70-90% of the total number of enterprises. In the US small and medium-sized business sector, approximately 53% of the working-age population work in Japan, the figure is 71.7%, and in the European Union (EU) countries, about 50% of the working civilian population work in small enterprises. In addition, in the EU countries, medium-sized enterprises make up only 1% of the total number of enterprises, while providing about 20% of the total turnover of enterprises and 17% of the total employment of the population (Babich 2016; Kowo et al. 2019).

As the analysis of the experience of developed countries shows, the state plays an important role in creating favorable conditions for stimulating innovative activity in all sectors of the economy (Mamedov et al., 2016; Cichy and Gradoń, 2016; Baltgailis, 2019).

The state provides both direct support for innovation (selection of priority areas for the development of science and technology, financing from the state budget) (Zizlavsky, 2016; Vaculík et al., 2017) and indirect support (using fiscal methods, legislative regulation, creating favorable conditions for the commercialization of scientific knowledge) (Krpálek et al., 2016; Ivanová and Masárová, 2016; Newman et al., 2018).

As a result, the pivotal goal of the SME support policy implemented within the European Union is to balance the interests of business and the state, ensure rational conditions for business, and increase the competitiveness of SMEs. The unique system of support and regulation of small business in Europe began to emerge as early as the 1970s, and continues to emerge through the introduction of various programs and the creation of support funds for the IB. At present, the key directions of the European Union's policy regarding the development of small business are:
- financial support for SMEs;
- simplification of the legal framework, administrative procedures in the field of small business support;
- participation of associations that represent the interests of small and medium-sized businesses in decision making within the framework of the EU;
- assistance to SMEs in the field of innovation, research and training;
- elimination of violations in the functioning of the "single market" and competition, reducing the effectiveness of SMEs;
- increasing the competitiveness of SMEs, in particular, in order to enter the foreign market;
- cultivating entrepreneurship among EU citizens and supporting various forms of cooperation between SMEs.
The current state of small and medium-sized businesses in Kazakhstan is characterized by intermittent trends
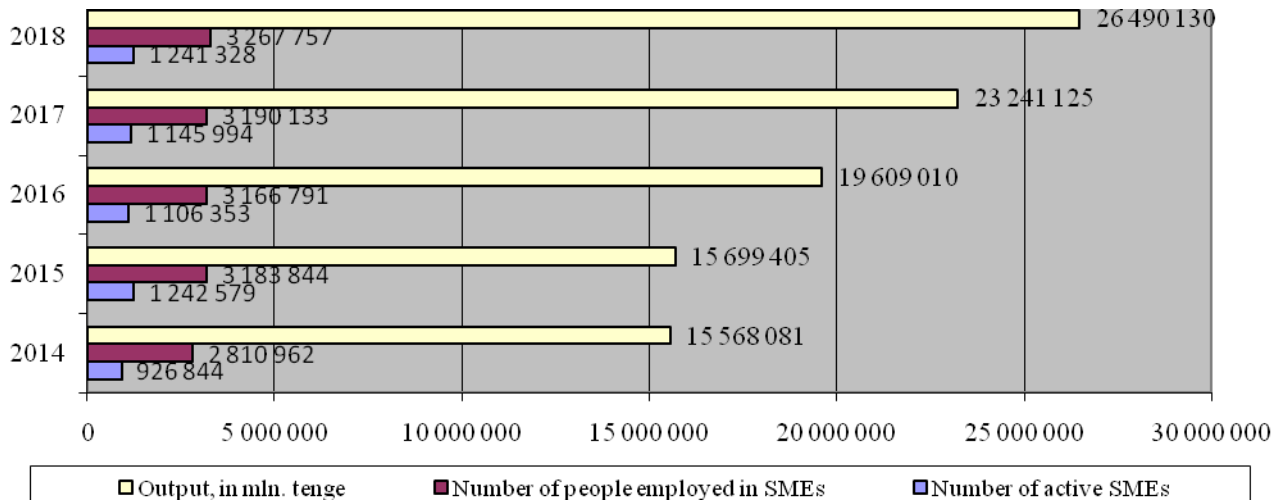
(Figure 1).

Figure 1. Dynamics of development of small and medium-sized businesses in Kazakhstan
Source: compiled by authors according to Committee of Statistics of the Ministry of National Economy, http://www.stat.kz

According to the results of the analysis, in the structure of active SME entities, according to the organizational and legal forms, the entities that carry out entrepreneurial activities without forming a legal entity prevail - individual entrepreneurs, whose number in 2017 is 747.1 thousand units - 65.2% of the total active subjects. The number of FH - 187.5 thousand or 16.4%, small and medium enterprises - 211.3 thousand units or 18.4% of the total number of active small and medium-sized businesses (Table 1).

Table 1. Structure of active SMEs by organizational legal forms

Type of ownership	2015	2016	2017	Share of total active subjects, in %		
				2015	2016	2017
Individual entrepreneurs	882849	736121	747107	71,0	66,5	65,2
Peasant farms	181 154	177 884	187527	14,6	16,1	16,4
Small and medium enterprises	178576	192348	211360	14,4	17,4	18,4
Total active subjects	1 242 579	1 106 353	1 145 994	100	100	100

Source: compiled by authors

The proportion of the population actively engaged in small business in 2017 was 40.8% of the total number of people employed in the domestic economy. The dynamics of this indicator for the period from 2013 to 2017 has the following trend: for example, the share of the population actively engaged in SMEs in 2017 by 2013 increased by 23.8%, and by 2016 it increased by 0.7%.
The structure of small businesses in the sectors of the country's economy is an important indicator of the qualitative development of the private entrepreneurship sector and the economy as a whole. The analysis allows to draw the following conclusions (in accordance with table 2).

Table 2. Estimation of small and medium-sized businesses by industry for 01.01.2018

№	Industry	Share of active SMEs in the total number of registered SMEs in the industry, in %	Number of employees, in %	Output, in %
1	Agriculture	19,4	13,1	7,8
2	Industry	3,7	10,1	20,3
3	Construction	4,5	8,9	17,1
4	Trade	35,6	29,1	23,7
5	Ansport and warehousing	6	5,6	5,9
6	Others	30,8	33,2	25,2

Source: compiled by authors

As can be seen from the data presented, the share of active SMEs by industry in 2017 is as follows: agriculture 19.4%, trade 35.6%, transport and warehousing 6%. The largest share in the total volume are trade and communication enterprises, and the smallest industry.

Next, we will analyze small and medium businesses by region in 2017 (Table 3).

Table 3. Estimation of small and medium business in the context of the regions of the Republic of Kazakhstan for 01.01.2018

Region	The number of active SMEs, in units	Share of active SMEs in the total number of registered SMEs in Kazakhstan, in %
Republic of Kazakhstan	211 360	100,0
Akmola	6 551	3,1
Aktobe	9 133	4,3
Almaty	8 779	4,2
Atyrau	6 119	2,9
West Kazakhstan	5 597	2,6
Zhambyl	5 282	2,5
Karaganda	16 288	7,7
Kostanay	6 761	3,2
Kyzylorda	4 887	2,3
Mangystau	7 498	3,5
South Kazakhstan	16 686	7,9
Pavlodar	8 583	4,1
North Kazakhstan	4 829	2,3
East Kazakhstan	10 058	4,8
Astana city	35 590	16,8
Almaty city	58 719	27,8

Source: compiled by authors

Review of the number of active SMEs by region in 2017 showed that the largest number was located in Almaty (58.7 thousand units), Astana (35.6 thousand units). A smaller number of active SMEs in Kyzylorda (4.9 thousand units). Of all registered SMEs, about 55% are active, i.e. carry out ongoing activities and submit reports to the statistical authorities.

Summing up, we note that as of May 2018, the Republic of Kazakhstan among the countries of the world, according to the favorable conditions for doing business, ranked 28th according to the World Bank DoingBusiness rating. According to such indicators as "registration of enterprises", "registration of property" and

"taxation", Kazakhstan took 36, 18 and 56 places, respectively. It is also worth noting that over the past 3 years, the position of the Republic of Kazakhstan has steadily increased from 80 to 28 (Statistics Committee 2018).

3. Methodology

At the same time, despite the positive development trend of small business, as a result of the analysis, the Republic of Kazakhstan is lagging behind in terms of the development parameters of SMEs from foreign countries. It should be noted that the main factors hindering the development of this sector according to the results of monitoring conducted by the Economic Research Institute are:
- imperfection of tax policy;
- instability of the general economic situation in the country;
- low level of solvency of the Kazakhstan population;
- lack of working capital;
- low competitiveness of SMEs;
- interaction with government bodies;
- lack of qualified personnel;
- insufficient number of financial and scientific institutions;
- insufficient financial support and state financial support;
- unavailability of credit funds.

The latter factors are the most important, since it is the state that should support the development of private entrepreneurship. The small business sector is characterized by an increased level of risk, as a result of which many commercial banks themselves do not risk lending to SMEs. In addition, it should be noted that the refinancing rate set by the National Bank is very heavy for many SMEs (Bulatov 2018).

In international practice, it is considered normal when about 90% of credit funds are issued under state guarantees. In our country, there is also a system of state lending, which is an indispensable attribute of all government programs to support small and medium businesses. However, it was noted that its volume is not enough to cover the needs of SMEs.

The analysis allows us to conclude that the main sources of financing are the own funds of the founders of small enterprises - 21.7% and the profit obtained as a result of the business activity - 67.0. However, own funds are often not enough, and the lack of financial support can be felt both at the initial stage of business development and in the process of business development. In connection with what enterprises require borrowed funds, but according to the results of the analysis revealed that their share is significant small and is only 25.5%. At the same time, bank loans occupy only 9.4%. 21.7% of enterprises do not have opportunities for development. Small business support is the cornerstone of government policy. This is enshrined in such fundamental documents as the "Strategy of Kazakhstan - 2050". Issues of further strengthening the business environment are given exceptional attention in the annual Presidential Address to the people of Kazakhstan.

Today in the field of private entrepreneurship there are a number of economic problems, which from the point of view of entrepreneurs themselves include:
- high tax burden (47%);
- limited financial resources (46%);
- corruption in government (32%);
- difficulties in obtaining a loan (25%);
- staff qualification (12%);
- problems associated with the registration of the business itself (11%)
Financial problems manifest, above all:

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- in the absence of financial assets to meet their own investment and negotiable needs;
- in reducing the effective demand for products of SMEs;
- in the absence of funds, due to a significant reduction in turnover of small companies;
- in the growth of overdue accounts payable of enterprises to commercial banks, leasing companies and counterparties in the absence of a system for its restructuring;
- in the absence of access to credit in commercial institutions (due to tougher conditions and an increase in interest rates on loans).

Due to the difficulty of obtaining loans today in Kazakhstan operates the National Fund "Damu", whose main goal is to support small businesses.

The growth of the degree of financial support for small and medium-sized businesses is possible through the use of new financial and organizational resource-saving technologies, in particular, the introduction of elements of operational management accounting, factoring, forfeiting, as effective financial technology methods, leasing, outsourcing, franchising, the use of venture capital, cluster approach as modern forms of small business organization (Aimurzina 2015).

Improving the effectiveness of financial management for SMEs should be carried out through the improvement and implementation of financial asset management systems, namely, the establishment of an accounting system, optimization and short-term planning, as well as control, in order to improve the financial sustainability of small and medium-sized businesses (Khusainov and Isokov 2012).

The cluster approach for small and medium-sized businesses is one of the new and promising forms of cooperation in the Kazakh economy. However, its large-scale and successful implementation is possible only within the framework of the state strategy for the development of the national economy (Kaldybaev and Bayzakov 2017).

The development of public-private partnerships must be built on the basis of a concise legal framework. The state should create a transparent and understandable environment for the early large-scale implementation of resource-saving innovative methods, in order to increase the share of SMEs in GDP corresponding to developed countries.
At the same time, we can note a number of general recommendations that can assist in the development of entrepreneurship in the Republic of Kazakhstan: fiscal policy, that is, the policy in the field of legal expenses and taxes. It is necessary to make adjustments to the Tax Code of the Republic of Kazakhstan on taxation of strategic industries. Enterprises with problems in the implementation of projects, because of their novelty, should have certain preferences in the field of taxation. To date, only those enterprises that are located in the FEZ have these benefits;
 - monetary policy;
- income policy;
- social politics;
- state regulation of pricing;
- foreign economic regulation.
The main economic levers are:
- regulation of the discount rate (discount policy implemented by the National Bank);
- establishing and changing the size of the minimum reserves that financial institutions of the country are obliged to keep in the National Bank;
- operations of state institutions in the securities market, such as the issuance of government obligations, their trade and their redemption.

Direct state economic regulation is carried out by means of budget policy (Aimurzina, Kamenova and Omarova 2018).

The main instrument for raising funds to cover public spending is taxes. Taxes in state regulation of the economy play two roles:
- the main source of financing public spending;
- regulation tool.
In general, the main tasks of state support of financial support for entrepreneurship should be:
- provision of collateral for the obligations of business entities based on credit agreements (leasing, loan agreements, bank guarantees, etc.) in the form of a guarantee;
- maximum satisfaction of the needs of entrepreneurship in credit resources and the provision of financial support;
- financial support of state programs for support and development of entrepreneurship by accumulating budget funds and revenues from own activities;
- increase in the volume of collateral for the obligations of business entities of Kazakhstan (support infrastructure organizations) based on loan agreements (leasing, loan agreements, bank guarantees, etc.) in the form of a guarantee;
- stimulation of banking services for private entrepreneurship due to the system of control over the execution of the tasks facing each of the Banks - Participants of the program;
- ensuring the implementation of obligations under the signed contracts of guarantee (Aimurzina and Kamenova 2017).

Directions of state financial support for SMEs at the regional and local levels should include:
- preferential loans;
- direct financial subsidies;
- Selective loan guarantee
- granting tax exemptions;
- transfer of a part of state property to the SME entity;
- the provision of profitable regional government orders;
- simplification of registration and licensing activities;
- economic and legal preferential consulting.

The central task facing the state is to form a coherent and transparent system of state policy in the field of financial support for small and medium-sized businesses. Such a system cannot be formed without developing and introducing into practice a mechanism for the separation of powers between the government bodies of the Republic of Kazakhstan.

Consequently, only with an integrated approach that takes into account the specifics of the region, but also at the same time, based on their national principles and priorities, it is possible to achieve the desired positive results in the field of SME development and achieve its financial sustainability and stability. Here we can highlight the following measures (Figure 2).
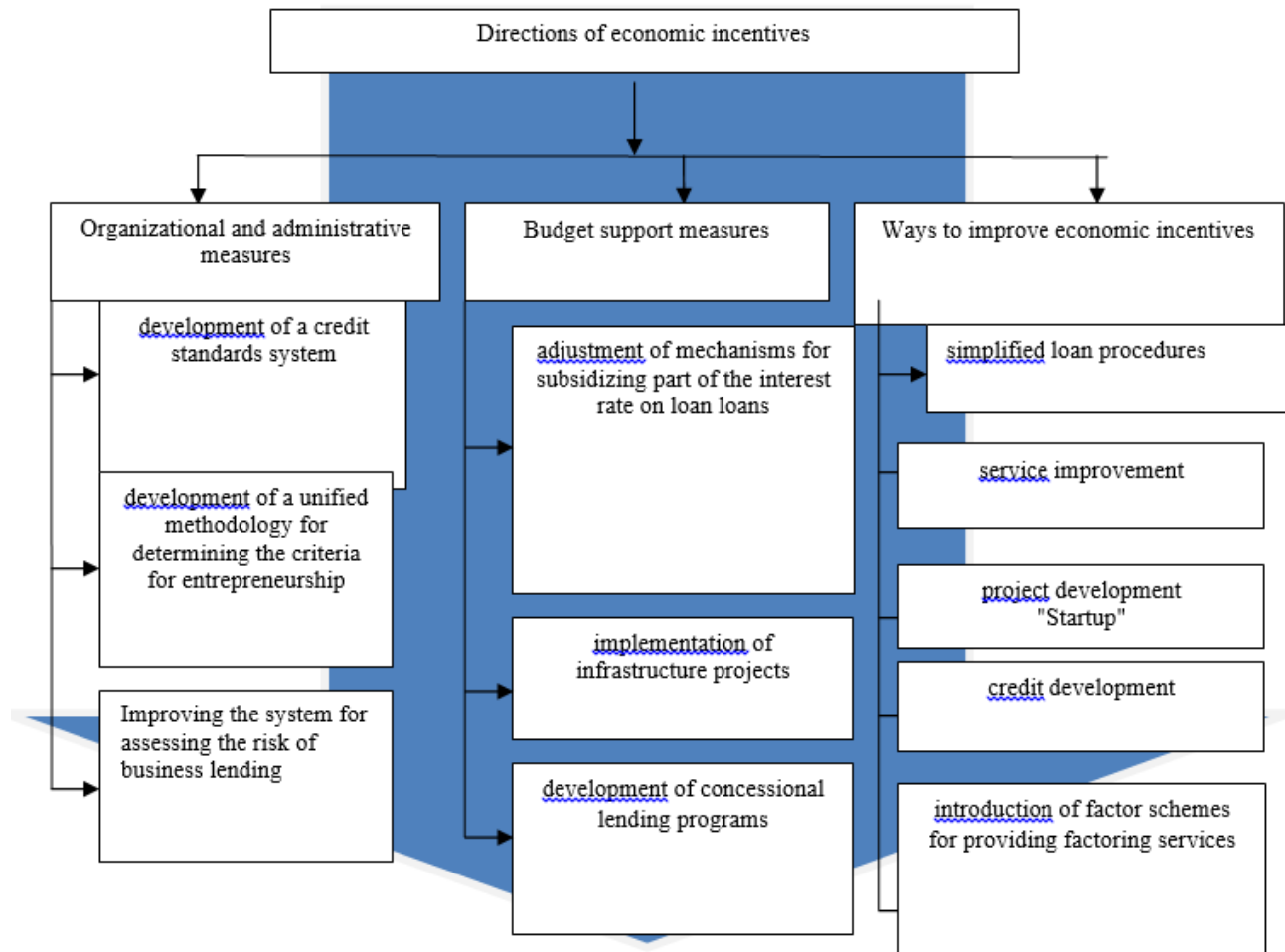
Figure 2. Directions of economic incentives for entrepreneurship
Source: compiled by authors

Within the framework of measures for financial provision of small and medium-sized business entities at the local level it is advisable:
- to develop a program of preferential loans;
- to create a guarantee fund to support small innovative businesses, which will help reduce the risks of lending to this category of business entities and increase the effectiveness of the use of funds accumulated to support them;
- to provide support through the provision of support to organizations focused on supporting entrepreneurship;
- to stimulate the development of leasing activities;
- to expand the information system (conditions for obtaining financial support as part of the implementation of business support programs);
- to establish a system of tax incentives for business enterprises, providing, under conditions stipulated, for example, such as large capital investments, reinvestment of profits in R & D, insurance, etc.

Today, the best way to develop high-tech productions of competitive products with high added value in Kazakhstan is to actively attract strategic foreign investors (companies) from highly developed countries to establish their subsidiaries or branches in our country, they have extensive experience in developing such

industries abroad. , they do not need to be called for the production of competitive products, they have better management, they have broad access to innovations, high technologies, good of established economic ties, a great experience in a competitive environment, competitive market - their element (Skala 2012).

Only they can facilitate and accelerate the process of introducing the Kazakhstani economy to high technologies, establishing production of products with high value added competitive in foreign markets. They can bring not only the knowledge and experience of business, high technology, effective management, but also cheap long-term money, which is so badly lacking for domestic private business. They will help accelerate the development of domestic highly professional entrepreneurs, especially if joint ventures are created. This would reduce the urgency of the long money problem for domestic entrepreneurs (Radionov 2016).

As practice shows, the full-scale development of Kazakhstan entrepreneurship will require much more time. In general, the globalization of domestic business is fully consistent with the long-term goals of the Kazakhstan-2050 strategy to create a highly industrial society based on the principles of a social market economy. In this context, with long-term forecasting, it is advisable to choose the direction of socio-economic foresight until 2050, highlighting the main strategic orientations that determine the functioning of SMEs.

4. Results

Currently, many methods are developed for predicting one time series (Rossiter 2015). The purpose of such a forecast is to show what results can be achieved in the future if we move towards it with the same speed or acceleration as in the past. The forecast determines the expected options for economic development based on the hypothesis that the main factors and trends of the past period will be preserved for the forecast period or that can be justified and take into account the direction of their changes in the perspective. A similar hypothesis is advanced on the basis of the inertia of economic phenomena and processes (Sartov 2016).

The predictions based on the extrapolation of the time series can be represented as a specific value of the function:

$$Y_{t+l}^* = f(y_i, l, a_j) \qquad (1.1)$$

where:

Y_{t+l}^* - predicted value of a number of dynamics;

l – lead period;

y_i – row level taken as extrapolation base;

a_j – trend equation parameter.

Having smoothed the time series by the least squares method, we obtain a linear trend dependence of the form:

$$\hat{Y}_t = f(t) \qquad (1.2)$$

Extrapolation is carried out by substituting into the trend equation the value of the independent variable t, corresponding to the value of the lead (forecast) period. Extrapolation makes it possible to obtain a point value of the forecast, i.e., an estimate of the predicted indicator at a point using the equation describing the trend of the predicted indicator. It is the average estimate for the predicted time interval. The magnitude of the confidence interval of the trend extrapolation is determined as follows:

$$Y^*_{t+l} \pm K^* \cdot S_y \qquad (1.3)$$

$$t = n, \qquad l = 1, 2,...L$$

where:

Y^*_{t+l} — point forecast at the moment $(t+l)$;

S_y — average square error of a trend;

K^* — multiplier, determined by the table with a given probability.

The value of K * depends only on the number of observations (the number of levels of the row n) and l (the lead period). With increasing n, the values of K * decrease, and with increasing l increase. Consequently, a fully reliable forecast is obtained with a sufficiently large number of observations (for a linear trend, for example, not less than 6 and the lead time is not very long. For the same n, the confidence interval of the forecast increases with increasing l.

The standard (root mean square) error in estimating the predicted index Sy is determined by the formula (1.4):

$$S_y = \sqrt{\frac{\sum_{t=1}^{n}(Y - \hat{Y})^2}{n - m}} \qquad (1.4)$$

where:

Y - the actual value of the level;

$\hat{Y}$ - the estimated score of the corresponding indicator for the model;

n - sample size;

m - the number of parameters as a function of f(t).

We illustrate the use of this method on the example of forecasting the indicators of production development of entrepreneurship in the Republic of Kazakhstan. To carry out calculations, we use the data of the time series for the period 2013-2018, presented in Table 4.

Models obtained using regression analysis, allow us to predict the options for the development of economic processes and phenomena, to study the trends in economic indicators, i.e. serve as a tool for science-based predictions. The results of the forecast are the source material for setting real economic goals and objectives, for identifying and making the best management decisions, for developing business and financial strategies in the future (Granberg 2015).

We will conduct a quantitative calculation of the forecast based on formalized forecasting methods, which are based on actually available information on indicators such as: output by all SMEs, mln. Tenge, number of active SME enterprises, units, number of people employed in SMEs, pers. by the extrapolation method for the analytical alignment of the trend, as well as by the exponential smoothing method.

Table 4. Forecast indicators of entrepreneurship development in the Republic of Kazakhstan

Period number	Years	Forecast of output by all SMEs, in mln. tenge	Forecast of the number of active SMEs, in units	Forecast of employment in SMEs, in pers.
x		f(x)	f(x)	f(x)
1	2013	9 165 412,000	69 388	2 576 899
2	2014	15 568 081,000	79 388	2 810 962
3	2015	15 699 405,000	178 576	3 183 844
4	2016	19 609 010,000	192 348	3 166 792
5	2017	23 241 125,000	211 360	3 190 133
6	2018	26 314 313,100	2 011,783	3460415,4
7	2019	29 533 548,600	2 016,502	3553988,02
8	2020 forecast	32 191 331,513	2 018,397	3621207,916
9	2021 forecast	35 962 099,182	2 018,980	3780313,323
10	2022 forecast	38 992 101,328	2 019,500	3923557,48
11	2023 forecast	42 074 688,734	2 022,700	4013679,267

Source: compiled by authors

We will smooth the time series by one of the main methods of regression analysis - the method of least squares. As a result, we obtain a linear trend dependence of the form (Figure 3, 4, 5):
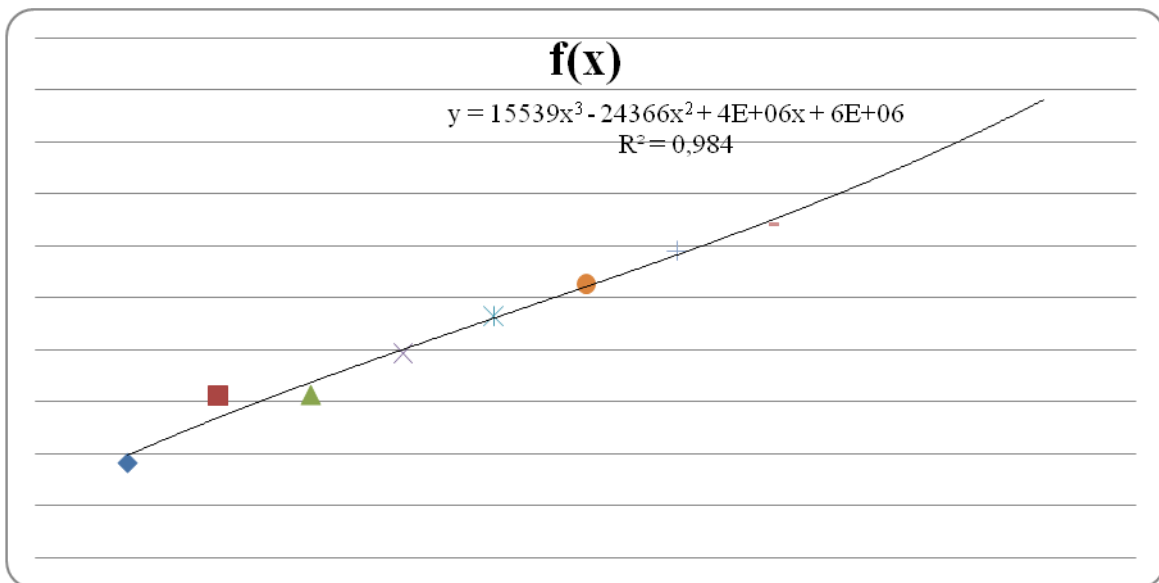

f(x)

$$y = 15539x^3 - 24366x^2 + 4E{+}06x + 6E{+}06$$
$$R^2 = 0,984$$

Figure 3. Forecast of output by all SMEs, in mln. Tenge
Source: compiled by authors

Extrapolation is carried out by substituting into the trend equation the value of the independent variable t, corresponding to the value of the lead (forecast) period. The model, on the basis of which the forecast was made, with an accepted probability level of 0.9, i.e., with a confidence level of 90%, suggests that while maintaining the existing patterns of development, the predicted value falls within the interval formed by the lower and upper bounds. However, if there is not enough reliable a priori information about the patterns of change in the studied economic phenomenon, then a simple extrapolation with the trend can lead to significant errors, as indicated by the Polish statistician Z. Helwig (Bogdanov and Zaitseva 2013).

$$y = 2763{,}x^3 - 49082x^2 + 23202x - 14799$$
$$R^2 = 0{,}687$$
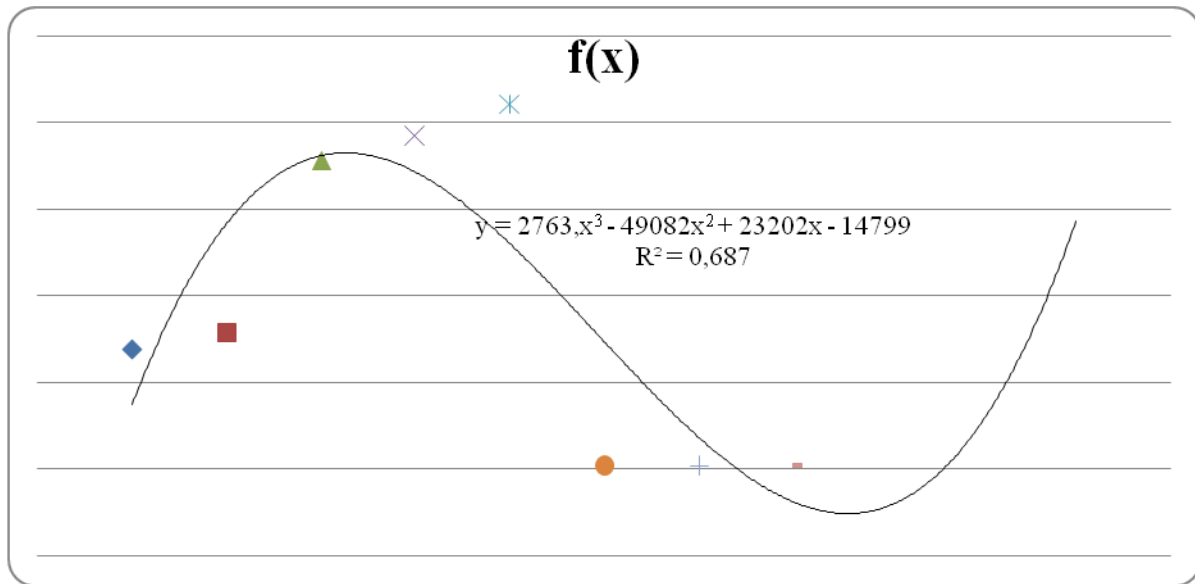
Figure 4. Forecast of the number of active SME enterprises, in units
Source: compiled by authors

It should be noted that the extrapolation methods must be applied at the initial stage of forecasting to identify trends in indicators. The main stage of trend extrapolation is the selection of the optimal type of function that describes the empirical series. The task of choosing a function is to select from the actual data xi, yi the form of the dependence (line) so that the deviations i of the data of the initial series yi from the corresponding calculated y'i being on the line are the smallest (Figure 1). After that, you can continue this line and get a forecast.
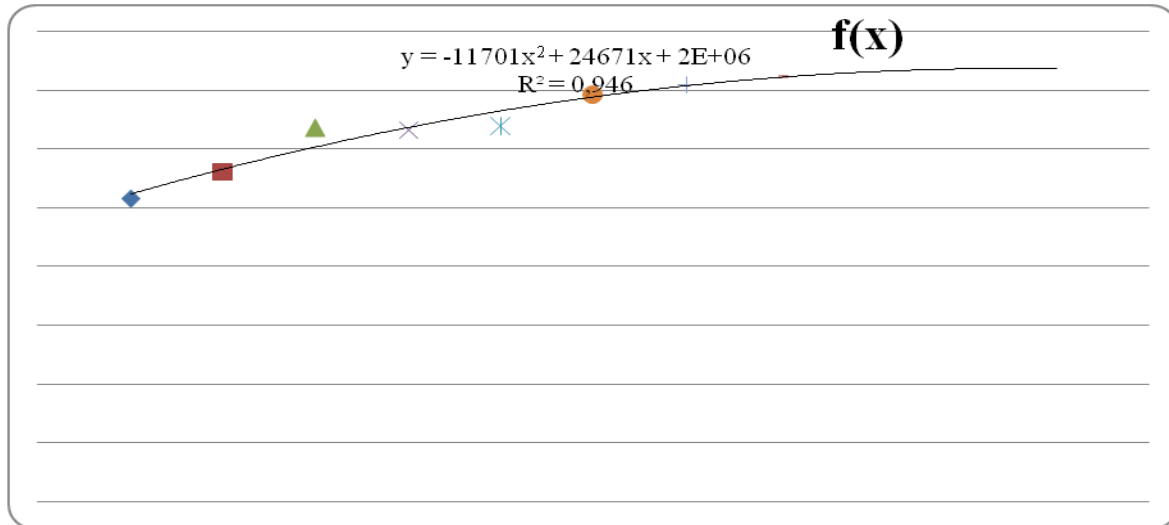
Figure 5. Forecast of the contribution of small and medium enterprises to the gross domestic product, in percent
Source: compiled by authors

Conclusions

Predictive calculation of medium-term indicators of production by all SMEs, the number of active SMEs, the number of people employed in SMEs, conducted by simple extrapolation, shows that production by all SMEs by 2023 will increase almost 2 times compared to 2017. The growth will occur mainly due to the extensive factor - the growth in the number of active SMEs, which will grow by 0.3% over the same period. At the same time, by 2023, the number of employed will increase by almost 1.3 times, or by 824 thousand people.

Thus, to improve the economic levers of business regulation, it is necessary:

- at the legislative level, to facilitate access to credit loans, to provide tax benefits to commercial banks lending to small and medium-sized enterprises;

- to optimize the taxation of private entrepreneurship, so that the tax burden does not constitute the basis for the liquidation of activities;

- improve the work of leasing companies, provide tax and other benefits to those who provide services to small and medium-sized businesses at low interest rates;

- to attract employment services for financing private entrepreneurship so that their financial resources go not only to the payment of unemployment benefits, but also, for example, to preferential loans to entrepreneurs who help solve employment problems;

- to increase the number of government orders provided by the SMB, and to give this decision the form of the law and monitor its implementation;

- to increase the responsibility of local governments for financial support and development of entrepreneurship, to control the targeted use of funds allocated from the budget for the financial support of small and medium-sized businesses.

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STATISTICAL METHODS IN INVESTMENT INSURANCE

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Abstract. The economy of Kazakhstan is becoming more and more integrated into the global economy every year, and this process will continue. Kazakhstan's accession to the WTO has opened the insurance market to foreign insurers even more. At the same time, foreign companies have more experience in conducting insurance operations and actively apply the latest economic and statistical methods for assessing and managing risks. In the Republic of Kazakhstan, the practice of risk management of the insurance company is not widespread, which makes the results of this study relevant and of practical importance.The development of the insurance business is associated with attracting investment. In these conditions, company management is faced with a difficult task: on the one hand, they are interested in attracting additional capital to develop and improve the reliability of the business, and on the other hand, investors demand a return on invested capital no less than alternative investments can bring. Therefore, in order to answer the challenge, you need to be able to calculate the optimal amount of attracted capital, adequate to the risks of the company. The development of methods to optimize the investment strategy is an urgent problem for the development of the Kazakhstan insurance market, the solution of which is also reflected in this article.

Keywords: insurance; statistical methods; insurance market

1. Introduction

Currently, insurance plays an increasingly important role in the system of financial and economic relations. Issues of guaranteeing the reliability and sustainability of the insurance company are of paramount importance to the insured. In the absence of confidence in the availability of such guarantees, insurance loses all meaning. Indeed, the insurance process involves the transfer of risk to the insurer and an increase in the financial stability of the

insured, whether it is an individual or an enterprise (Badyukov&Rozhkov&Feoktistova 2007). At the same time, the increase in the volume of risks for the insurer should be compensated by various methods:
- increase in the volume of insurance operations;
- reinsurance;
- accumulation of reserves, etc.
The influence of the volume of insurance operations on the financial stability of an insurance company is directly related to the operation of the statistical law of large numbers. The larger the number of insured objects, the less likely the deviation of the actual amount of insurance payments from the average expected amount of losses for a certain period. An estimate of the average amount of losses under insurance contracts is included in insurance rates. Deviation to a larger side from the average value of losses is fraught with failure by the insurer to fulfill its obligations, i.e. its insolvency. Although the calculation of insurance rates provides for the so-called risk premium for this case, and the insurer can accumulate a certain part of the funds as a result of investing insurance reserves, nevertheless, the only way to minimize the possible deviations of expected losses from the average value is to adequately estimate them and develop appropriate measures.

The concentration of significant financial resources in the hands of insurance organizations makes insurance the most important factor in the development of the economy through an active investment policy. Insurers convert passive funds received from various policyholders into active capital in the market.

2. Literature review

It can be noted that "collecting and accumulating colossal money, bourgeois insurance nourishes the banking system with its contributions and makes it possible to use insurance capital extensively and for a long time by turning them into stock values for the state's needs" (Reicher 1974).

Back in 1925, K.G. Voblyi noted that insurance companies, satisfying a need that would otherwise have been unsatisfied, managed to accumulate capital that would not have been collected without such accuracy and in such an amount (Voblyi 1993).

A.A. Mamedov points out that the insurance market has a regulatory function, which is manifested in ensuring the continuity and balance of social production through the investment of temporarily free funds of state social extra-budgetary funds and reserve funds of insurance structures (Mamedov 2003).

According to the some scientists and their studies, the ability to accumulate financial flows and direct them to the development of the economy; it turns insurance organizations into a powerful institutional investor. In all countries of the world, insurance is a strategic sector of the economy. Thus, the total investment of insurers in Europe is about 28% of GDP, which corresponds to approximately 2.2 trillion euro. In the early 90s of the twentieth century, insurance companies in Europe, Japan and the United States managed total investments of $ 4,000 billion. More than 80% of these investments were secured by life insurance operations, 50% were placed in private or public debt, of which 12 - in bonds and 15 - in the mortgage (Gvarliani & Balakireva 2004).

I.A. Krasnova in works on insurance marketing notes that the insurer does not acquire the product as such, but its ability to satisfy its specific need. That is why for the insurance organization it is important to present and distribute not the product itself and its properties, but the benefits and benefits of it for policyholders (Krasnova 1997).

The specialized literature on insurance offers a large number of definitions of "insurance market". Since insurance is a relationship associated with the formation and use of trust funds, often the content of the insurance market is identified with a study of only the economic basis of insurance (Gvozdenko 1998; Horsch et al., 2018).

In the monograph of Zhilkina A.N. the theoretical justification is given that the economic importance of insurance consists not only in compensation for damage resulting from the occurrence of an insured event, thereby ensuring stability, security of business activities, increasing the competitiveness of business entities, but also in the fact that it is one of the areas of entrepreneurship, the results of its activities contribute to the formation of GDP, and obtaining insurance profit is the financial basis for its development, improvement modernization on the basis of innovation, as well as creating opportunities for investment (Zhilkina 2014).

Thus, insurance companies should be considered as an institutional investor, i.e. a kind of financial institution, which, due to the specifics of its activities, can be described as a specialized investment institution (Electronic resource: https://kursiv.kz/news/strakhovanie/2019-01/v-kazakhstane-vveden-novyy-vid-strakhovaniya-unit-linked).

3. Methodology

In conditions of market relations, increasing the level of complexity of functioning socio-economic systems is reflected in the requirements for managing their quality and effectiveness. In modern practice, the insurance process is closely interconnected with the general management of the company's assets and liabilities and covers the entire set of actions aimed at eliminating or at least reducing entrepreneurial risk. In Kazakhstan, insurance of business risks is not as widespread as insurance of motor vehicles, property, liability, etc. However, foreign experience shows that this type of insurance is economically viable and in the near future should become the normal financial practice of enterprises (Alzhanova 2013; Grmanová & Strunz, 2017; Malyovanyi et al., 2018).

Analysis of the insurance market involves the processing of large volumes of information characterizing the studied objects; therefore this is one of the most critical stages of the study, largely determining its effectiveness. (Myšková & Hájek, 2017; Boyko and Derun, 2016; Derun and Mysaka, 2018).

The statistical reporting system allows you to obtain data on the number of insurance organizations, types, distribution by ownership and legal forms. The main indicators of the activities of insurance companies are the size of insurance premiums and payments, the number of concluded contracts, existing contracts for groups of consumers of insurance services.

Bureeva N.N. notes that among the many possible probabilistic-statistical models, one can reasonably choose the one that best fits the initial statistical data characterizing the actual behavior of the studied set of objects, evaluate the reliability and accuracy of conclusions made on the basis of limited statistical material (Bureeva 2007).

Due to the fact that the insurance market is integrated into the socio-economic environment, in addition to using direct information from insurance statistical reporting, it is advisable to use performance indicators of other sectors of the economy for the diagnosis of insurance markets according to the Figure 1 (Badyukov & Rozhkov & Feoktistova 2007).
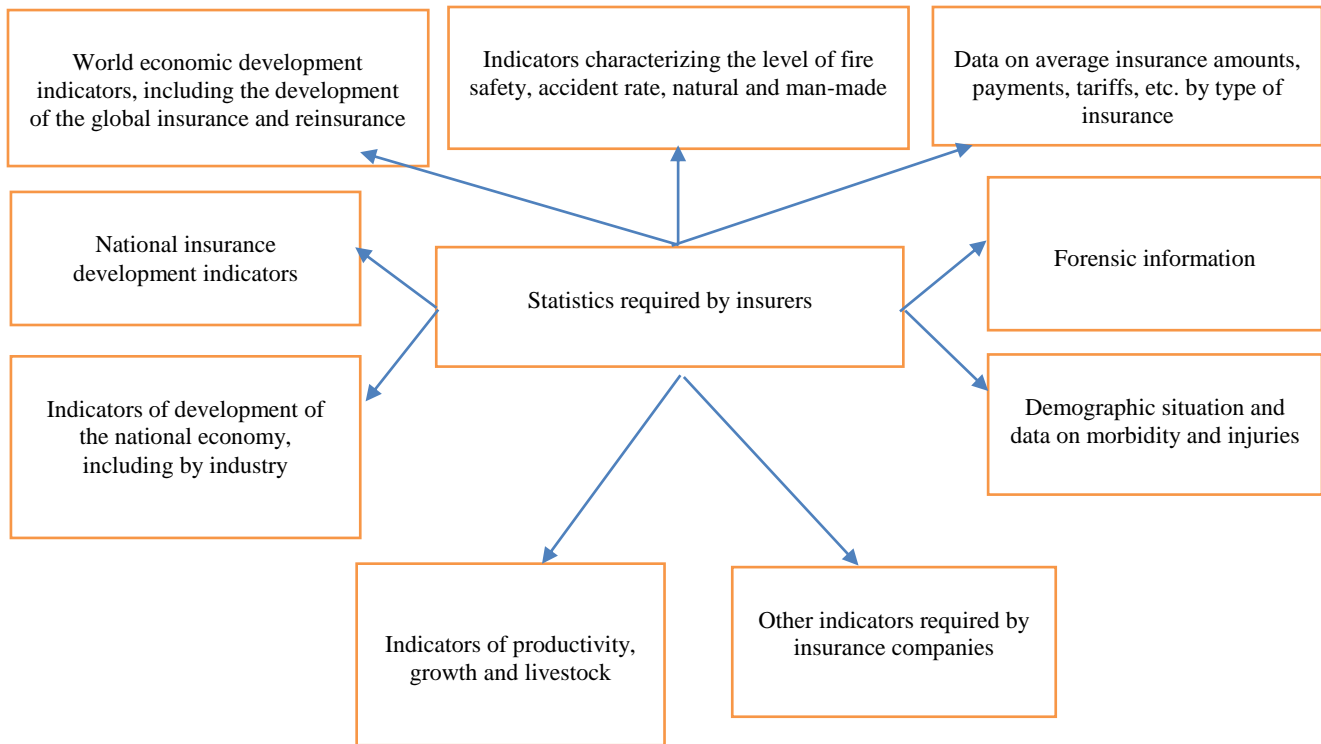
Figure 1. Indicators used to diagnose the insurance market.
Source: compiled according to the source Badyukov & Rozhkov & Feoktistova (2007)

Before considering insurance methods, it is necessary to analyze the dynamics of development indicators of the insurance market of the Republic of Kazakhstan. In the study, using a selective statistical observation, an initial database was formed to determine the current state of the insurance market of the Republic of Kazakhstan. Through a scientifically organized collection of information on the number of insurance payments and premiums, a database has been formed to analyze the state and identify trends in the insurance market. The collection of information on the number of insurance transactions made it possible to form a database for the quantitative perception of the level of efficiency and concentration of the insurance market of the Republic of Kazakhstan.

According to the Report of the National Bank of the Republic of Kazakhstan at the end of 2018, the insurance sector of the Republic of Kazakhstan was represented by 29 insurance organizations, 15 insurance brokers and 56 actuaries. The total assets of insurance companies in 2018 increased by 13.3% and amounted to 1,048.5 billion tenge at the end of the year.

Total equity for 2018 increased by 13.7% and amounted to 468.3 billion tenge. The amount of liabilities of insurance organizations amounted to 580,2 billion tenge, which is 13.0% more than in 2017. The amount of insurance reserves amounted to 519,5 billion tenge, or 89.5% of the total liabilities, which is 12.8% more compared to 2017 (Report of the National Bank of the Republic of Kazakhstan for 2018, 2019).

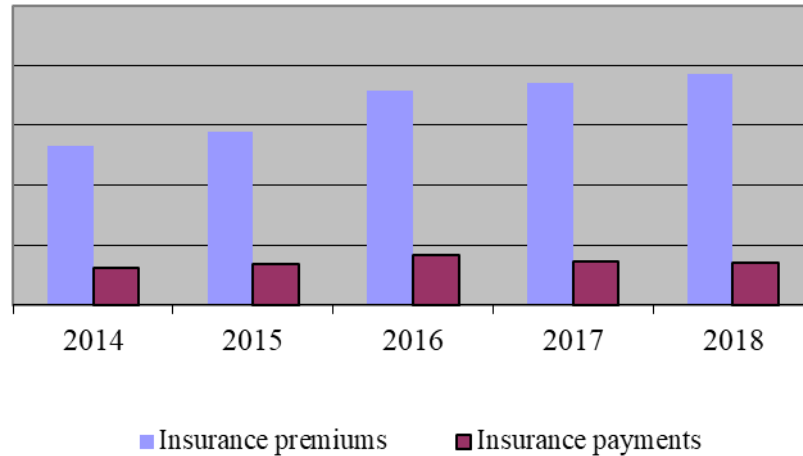Dynamics of insurance premiums and insurance payments is presented in Figure 2.

Figure 2. Dynamics of insurance premiums and insurance payments.
Source: compiled according to the source Decree of the President of the Republic of Kazakhstan dated May 23, 2019 No. 49 Report of the National Bank of the Republic of Kazakhstan for 2018 - Almaty, 2019

Taking into account the importance of investments for the economy of Kazakhstan, the possibility of using the potential of insurance resources in attracting long-term investments is extremely important. Moreover, it is possible that the transformation of insurance reserves into various sectors of the economy will contribute to the further development of the stock market in Kazakhstan.

4. Results

Based on the foregoing, it becomes clear the need to formalize the activities of the financial analysis of the insurance organization, which is an assessment of the effectiveness of managing the insurance portfolio in order to make a managerial decision.

Possessing economic and statistical tools for ensuring scientifically organized collection of information on the number of insurance payments and premiums, we consider it necessary, when studying the data of economic and statistical phenomena, to identify the interrelated patterns between the phenomena developing over time and conduct a related analysis of the dynamics. For this purpose, multi-factor models of interconnected time series are being constructed.

As the studies described in the works of various authors have shown, the results of forecasts of economic and statistical processes according to a model constructed from the series of dynamics are quite satisfactory. Therefore, it seems appropriate to consider in more detail just this technique for constructing a dynamic model of multifactorial forecasting.

For each year l of the studied period L, a multivariate model is constructed taking into account the exclusion of multicollinearity and the justification of the analytical form of the model. It is necessary that the estimates of the main factor be unbiased, consistent and effective in the considered period of time. The linear model of the studied process will take the following form: $\hat{Y}_l = a_0 x_0 + a_1 x_1 + a_2 x_2 + ... + a_m x_m$,

Where Y_l – simulated indicator of l year;

x_i – factors affecting this indicator, i = $\overline{0, m}$;

a_i – model parameters, i = $\overline{0, m}$;

m – number of factor signs.

We obtain a system of L such models, each of which is checked for adequacy by the F-criterion and t-criterion. To predict the dependent variable (resultant sign) by L steps forward, it is necessary to know the predicted values of all factors included in the model. Predicted values of factors are substituted into the model and receive point forecast estimates of the studied indicator.

To determine the range of possible values of the resultant indicator for known values of factors, i.e. confidence interval of the forecast, it is necessary to consider two possible sources of errors. Errors of the first kind are caused by the scattering of observations relative to the regression line, and they can be taken into account, in particular, by the value of the standard error of the studied parameter using the regression model. Errors of the second kind are due to the fact that the regression coefficients specified in the model are random variables distributed according to the normal law. These errors are taken into account by entering the correction factor when calculating the width of the confidence interval; the formula for its calculation includes the tabular value of t-statistics at a given level of significance and depends on the type of regression model.

Consider the forecasting process based on multifactor models on specific economic and statistical data shown in Figure 2.

The variable y (insurance premiums) depends on insurance benefits x1. Assuming a linear multiple regression model in the form of: $\hat{y} = a_0 + a_1 \cdot x_1$ define estimates a_0 , a_1 least squares parameter estimation.

Let us evaluate the regression equation:

We define the vector of estimates of the regression coefficients. According to the least squares method, the vector s is obtained from the expression: $s = (X^T X)^{-1} X^T Y$

Add a unit column to the matrix with variables X_j:

1	62
1	67
1	83
1	73
1	71

Matrix Y

266
288
357
370
385

Matrix X^T

1	1	1	1	1
62	67	83	73	71

Multiply matrices, (X^TX)

$$X^T X = \begin{array}{|c|c|} \hline 5 & 356 \\ \hline 356 & 25592 \\ \hline \end{array}$$

In the matrix, (X^TX), the number 5 lying at the intersection of the 1st row and the 1st column is obtained as the sum of the products of the elements of the 1st row of the XT matrix and the 1st column of the X matrix.

Multiply matrices, (X^TY)

$$X^T Y = \begin{array}{|c|} \hline 1666 \\ \hline 119764 \\ \hline \end{array}$$

Find the inverse matrix $(X^TX)^{-1}$

$$(X^T X)^{-1} = \begin{array}{|c|c|} \hline 20{,}908 & -0{,}291 \\ \hline -0{,}291 & 0{,}00408 \\ \hline \end{array}$$

The vector of estimates of the regression coefficients is

$$Y(X) = \begin{array}{|c|c|} \hline 20{,}908 & -0{,}291 \\ \hline -0{,}291 & 0{,}00408 \\ \hline \end{array} * \begin{array}{|c|} \hline 1666 \\ \hline 119764 \\ \hline \end{array} = \begin{array}{|c|} \hline 0{,}235 \\ \hline 4{,}676 \\ \hline \end{array}$$

Regression equation (estimation of the regression equation):

$$Y = 0.2353 + 4{,}6756 X_1$$

We turn to the statistical analysis of the obtained regression equation: checking the significance of the equation and its coefficients, studying the absolute and relative approximation errors.

For an unbiased estimate of variance, we perform the following calculations:

Unbiased error $\varepsilon = Y - Y(x) = Y - X*s$ (absolute approximation error)

Y	Y(x)	$\varepsilon = Y - Y(x)$	ε^2	$(Y-Ycp)^2$	$|\varepsilon : Y|$
266	290,122	-24,122	581,892	4515,84	0,0907
288	313,5	-25,5	650,273	2043,04	0,0885
357	388,31	-31,31	980,318	566,44	0,0877
370	341,554	28,446	809,173	1354,24	0,0769
385	332,203	52,797	2787,54	2683,24	0,137
			5809,196	11162,8	0,481

Estimation of standard deviation (standard error for estimating Y):

$$S = \sqrt{S^2} = \sqrt{1936{,}3986} = 44{,}005$$

We find the estimate of the covariance matrix of the vector $k = S^2 \cdot (X^TX)^{-1}$

Y(X) = 1936.4

20,908	-0,291		40487,185	-563,201
-0,291	0,00408	=	-563,201	7,91

Comparative assessment of the influence of the analyzed factors on the effective sign:
5. A comparative assessment of the influence of the analyzed factors on the effective sign is made:
- an average coefficient of elasticity, showing how many percent the average of the aggregate will change the result y from its average value when the factor x_i changes by 1% from its average value;
- β – coefficients showing that if the value of the factor changes by one standard deviation S_{xi}, then the value of the resultant attribute will change on average by β of its standard deviation;
- the share of each factor in the total variation of the effective attribute is determined by the coefficients of separate determination (separate definition): $d_i^2 = r_{yxi}\beta_i$.

$$d_1^2 = * = 0$$

In this case, the equality

$$\sum d_1^2 = R^2 = 0$$

Coefficient of determination: $R^2 = 0.6925^2 = 0.4796$

A more objective assessment is the adjusted coefficient of determination:

$$\bar{R}^2 = 1 - (1 - R^2) \cdot \frac{n-1}{n-m-1}$$

$$\bar{R}^2 = 1 - (1 - 0{,}4796) \cdot \frac{5-1}{5-1-1} = 0{,}306$$

The closer this coefficient is to unity, the more the regression equation explains the behavior of Y.

New explanatory variables are added to the model as long as the adjusted coefficient of determination increases.

Testing hypotheses regarding the coefficients of the regression equation (checking the significance of the parameters of the multiple regression equation):

The number $v = n - m - 1$ is called the number of degrees of freedom. It is believed that when evaluating multiple linear regression, to ensure statistical reliability, it is required that the number of observations be at least 3 times greater than the number of estimated parameters.

We calculate t - statistics:

T_{tabl} (n-m-1; α/2) = (3; 0,025) = 3,182

$$t_i = \frac{b_i}{S_{b_i}}$$

$$t_0 = \frac{0,235}{201,214} = 0,00117 < 3,182$$

The statistical significance of the regression coefficient b_0 is not confirmed.

$$t_1 = \frac{4,676}{2,812} = 1,662 < 3,182$$

The statistical significance of the regression coefficient b_1 is not confirmed.

Confidence interval for the coefficients of the regression equation:
We determine the confidence intervals of the regression coefficients, which with a reliability of 95% will be as follows:

$$(bi - ti \cdot Sbi; \; bi + ti \cdot Sbi)$$

b_0: (0,235 – 3,182·201,214 ; 0,235 + 3,182·201,214) = (-640,029; 640,499)

b_1: (4,676 – 3,182·2,812 ; 4,676 + 3,182·2,812) = (-4,274; 13,625)

Checking the overall quality of the multiple regression equation (F-statistics and Fisher test):
Let us verify the hypothesis of general significance - the hypothesis of the simultaneous equality to zero of all regression coefficients with explanatory variables:

$$H_0: R^2 = 0; \; \beta_1 = \beta_2 = \cdots = \beta_m = 0$$

$$H_0: R^2 \neq 0.$$

This hypothesis is tested using F-statistics of the Fisher distribution (right-hand check).

If $F < F_{kp} = F_{\alpha\,;\,n\text{-}m\text{-}1}$, then there is no reason to reject the hypothesis H_0.

$$F = \frac{R^2}{1 - R^2} \frac{n - m - 1}{m} = \frac{0,4796}{1 - 0,4796} \frac{5 - 1 - 1}{1} = 2,765$$

Table value with degrees of freedom $k_1 = 1$ and $k_2 = n\text{-}m\text{-}1 = 5 - 1 - 1 = 3$, Fkp(1; 3) = 10.1

Since the actual value is $F < Fkp$, the determination coefficient is not statistically significant and the regression equation is statistically unreliable (the joint insignificance of the coefficients for factors x_i is confirmed).

As a result of the calculations, the multiple regression equation was obtained: $Y = 0,2353 + 4,6756X_1$.

An economic interpretation of the model parameters is possible: an increase in X_1 by 1 unit of measurement leads to an increase in Y by an average of 4.676 units. The statistical significance of the equation was verified using the coefficient of determination and the Fisher test. It is established that in the studied situation 47.96% of the total variability of Y is explained by a change in factors X_j.

The national insurance market remains one of the stable suppliers of domestic investment resources, the Kazakhstan economy, especially its real sector, is in dire need of increasing its demand. The structure of the investment portfolio of insurance companies in Kazakhstan does not differ in high differentiation. Up to 90% of the insurance fund is placed in classic financial instruments - deposits and securities.

Such a tool as the issuance of loans, actively used by insurance companies in European countries, in Kazakhstan can only be used by insurance organizations licensed in the class of "life insurance". Its share does not exceed 0.1% of the total investment portfolio. Over the past 3 years, insurance companies have not invested in other instruments, including refined precious metals and metal deposits (old.kase.kz/ru/page/rfca_reports & www.Ranking.kz).

The structure of the investment portfolio of insurance companies in Kazakhstan is presented in Figure 3.
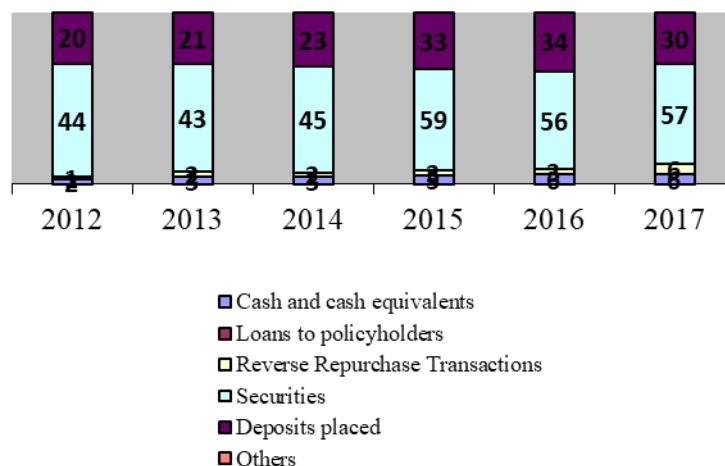
Figure 3. The structure of the investment portfolio of insurance companies in Kazakhstan, %.
Source: compiled by authors using the data of National Bank of the Republic of Kazakhstan of 2017 year

In 2017, insurance organizations invested about 39 billion tenge in the economy of Kazakhstan, the investment portfolio totals about 705 billion tenge. The largest increase was demonstrated by reverse repos - almost 83%. To date, this type of instrument is of interest from insurers due to their short-term and moderate profitability. The securities portfolio will be characterized by moderate growth - 8% or about 403 billion tenge at the end of 2017. The deposit portfolio, on the contrary, decreased by 5-6% due to high price risks due to revaluation.

The main source of profitability of the sector remains the income from insurance activities, the share of which in the total income varies from 83% -93%. The exception was 2015, when income from investment activities exceeded insurance income more than 2 times due to the transition to a free-floating exchange rate.

According to estimates, income from insurance in 2017 amounted to about 260-270 billion tenge. Income from investment activities was calculated at the level of 50-55 billion tenge (http://www.nationalbank.kz & old.kase.kz/ru/page/rfca_reports).

Financial results of the insurance sector is presented in Table 1.

Table 1. Financial results of the insurance sector, billion tenge.

Financial results	2012	2013	2014	2015	2016	2017
Total income	194	220	236	452	300	321
Total expenses	157	181	182	238	218	244
Total net profit (loss) before tax	37	39	53	214	83	76

Source: compiled by authors using the data of National Bank of the Republic of Kazakhstan of 2017 year

More than half in the structure of assets are securities: 599 billion tenge, or 53.7%, over the year the amount increased by 31.8%. Placed deposits and reinsurance assets concentrated 19.6% and 10.1% of assets, respectively, in total their amount is 331.6 billion tenge (http://www.nationalbank.kz & www.Ranking.kz).
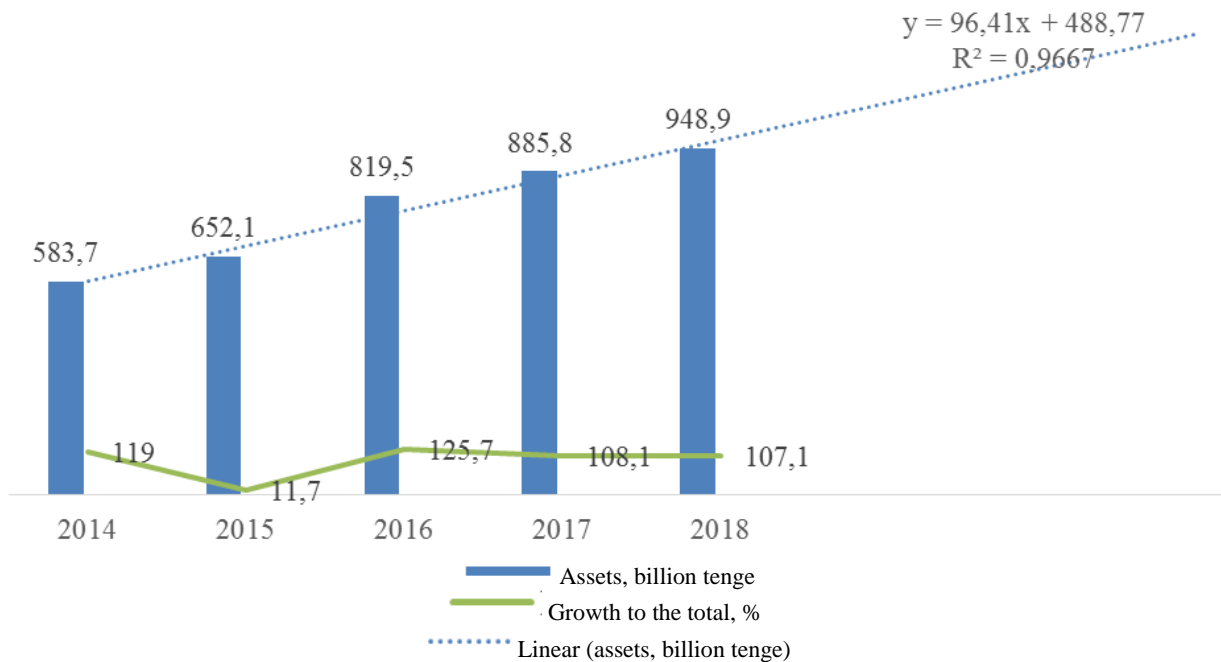

Figure 4. Assets of insurance companies of the Republic of Kazakhstan for the period from 2014-2018.
Source: compiled by authors according to the electronic sources http://www.nationalbank.kz; www.Ranking.kz

Over the past few years, the Kazakhstan insurance sector has been earning investment. The explosive growth in investment income is due to the simultaneous (2015) and permanent devaluation of the national currency. The main factors that S&P Global Ratings pays attention to when assessing the risks of investment activity of insurers are the level of concentration on one sector and the level of concentration on one counterparty. The volume of insurance premiums transferred for reinsurance amounted to 89.8 billion tenge, or 23.3% from the total amount of insurance premiums. At the same time, 83.7% of insurance premiums were transferred for reinsurance to non-residents of the Republic of Kazakhstan (https://forbes.kz/.../sp_global_ratings).

In Kazakhstan, insurance companies have requirements for the structure of the investment portfolio. But these requirements are more likely to relate to investments in individual counterparties than to investments in a particular sector. The graph shows the average sample of those insurance companies that S&P Global Ratings ranks in a particular country. In general, we see a sufficient concentration of investments in one sector in emerging markets. The main common feature of these markets is that most insurance companies invest in the financial sector, mainly in local banks.

In developed countries, taking into account risk-based approaches, the share of concentration in one sector and one counterparty is significantly lower. In general, S&P Global Ratings evaluates as neutral for assessing diversification of investment portfolios if the concentration share in one sector is less than 30%, and accordingly, on one issuer less than 10%. The lower concentration, the more positive the assessment (https://forbes.kz/.../sp_global_ratings).

Country portfolio diversification indicators is presented in Figure 5.
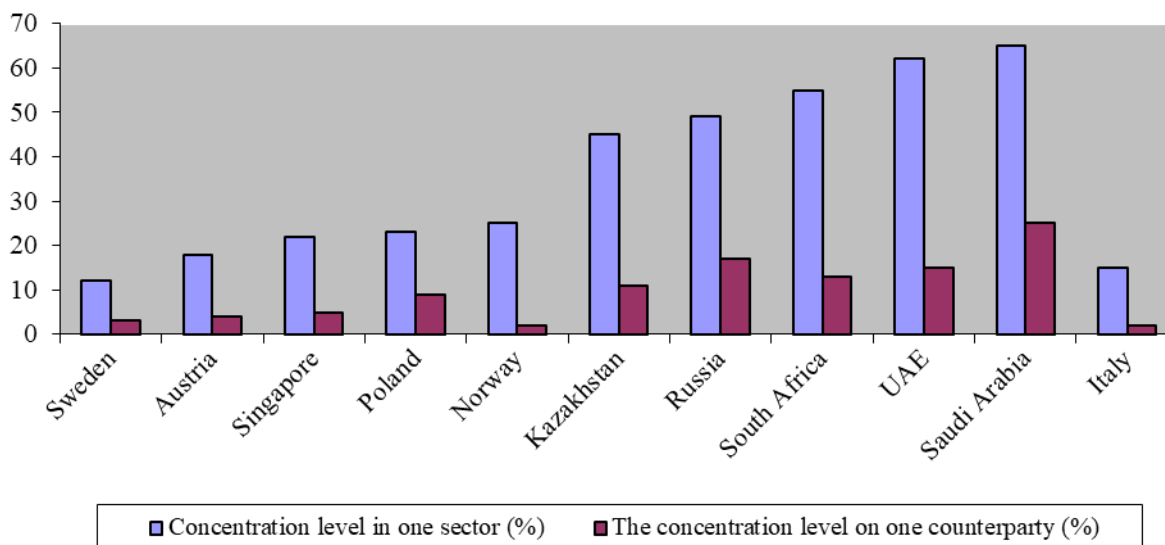
Figure 5. Country portfolio diversification indicators.
Source: compiled by authors according to the electronic source https://forbes.kz/.../sp_global_ratings

According to Figure 6, diversification of the investment portfolio: neutral assessment - if the concentration level is not higher than 15-30% for one sector, for one issuer in the investment portfolio.

Another component of diversification is the analysis of the level of high-risk assets (https://forbes.kz/.../sp_global_ratings & www.Allinsurance.kz).

Accordingly, S&P Global Ratings considers high-risk assets investments in fixed-income instruments with a rating below "BB +", shares, real estate, investments in partnerships and joint ventures. We include investments in real estate, with the exception of objects that the insurance company uses for its own activities. Or, for example, real estate in Switzerland is, in accordance with our criteria, a low-risk investment.

The share of high-risk assets varies from company to company. This is due to the available financial instruments that are currently on the market. We understand that the number of financial instruments with high credit quality is limited, therefore, the share of high-risk assets is significant in Kazakhstan. And, first of all, it is determined by the development of the banking sector (https://forbes.kz/.../sp_global_ratings).

Risk assessment in insurance of the banking system of Kazakhstan is presented in Figure 6.
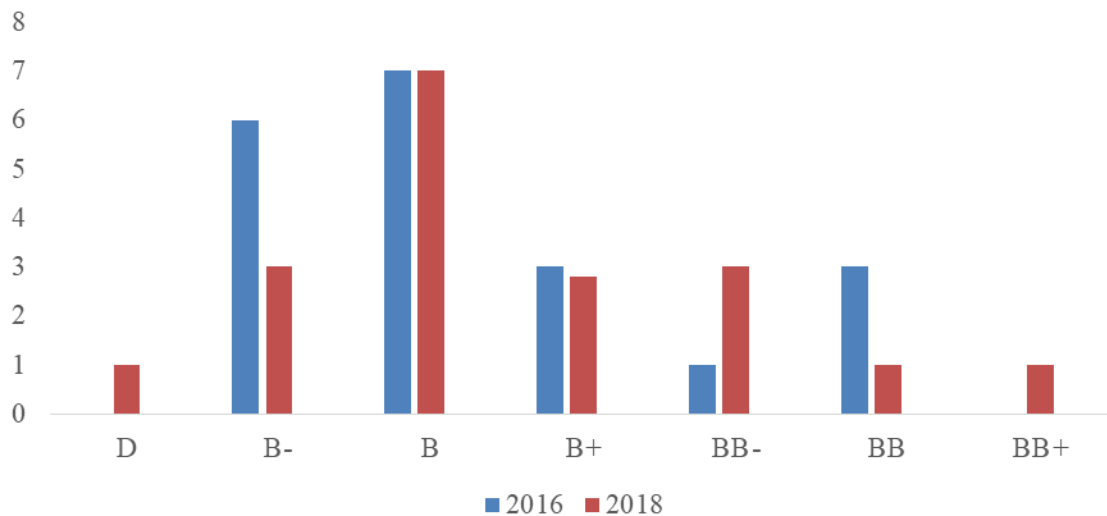
Figure 6. Risk assessment in insurance of the banking system of Kazakhstan**.**
Source: compiled by authors according to the electronic source https://forbes.kz/.../sp_global_ratings

Analyzing Figure 7, we can distinguish positive and negative factors:
1 Positive factors:
- The ability and willingness of the Government of Kazakhstan to provide support to banks with high and moderate systemic importance;
- the ability and willingness of shareholders to inject new capital and provide support to banks in the form of liquidity;
- stable funding and liquidity indicators of most banks.
2 Negative factors:
- unfavorable operating conditions for banks in Kazakhstan;
- low capitalization and profitability;
- high in the international context, the concentration of the loan portfolio on individual counterparties and sectors;
- high level of problem loans.

In general, we see that the ratings of banks in Kazakhstan remain low: most of the banks are in the rating category "B".

Vulnerabilities in the banking sector may subsequently affect the insurance sector, especially since more than 35% of all insurers' investments are in the banking sector. Therefore, the situation in the banking sector remains a pressing issue for insurance companies, and it will take time to overcome the difficulties that exist in the banking sector. But no less important is the question of diversifying the investment portfolio not only for general insurance companies, but also for life insurance companies, since financial instruments are limited, obligations are long, and investments are short.

Considering the currency risks of the Kazakhstan insurance market, it can be stated that the result from investment activities and the revaluation income in 2018 were not bad, just due to the revaluation of the currency (https://forbes.kz/.../sp_global_ratings&www.Allinsurance.kz).

Forecasted values of investment income of the Kazakhstan insurance market of Kazakhstan for 2019-2021is presented in Figure 7.

The chart shows the equation $y = 1,4286x^2 - 20,739x + 204,09$ and $R^2 = 0,3808$.

Figure 7. Forecasted values of investment income of the Kazakhstan insurance market of Kazakhstan for 2019-2021, %
Source: compiled according to the source Sedelev (2009)

A significant discrepancy between assets and liabilities in foreign currency - approximately 10% (the volume of unhedged assets denominated in foreign currency) of the capital of the insurance company - leads to a negative assessment when determining the rating of the insurance company.

Investment income of Kazakhstan insurers from the placement of deposits and investments in bonds averages about 7%. If we compare the return on investment of Kazakhstani insurers with developed markets, the situation is much better, because in some countries in developed markets there are negative interest rates, in others - income does not exceed 3%. This confirms the thesis that insurance companies in developed markets earn more on insurance than on investment.

In general, instruments with investment grade ratings prevail in the portfolios of European insurers. This is mainly due to the requirements of Solvency II, according to which insurance companies are guided by a balanced approach to the level of accepted risk and profitability; therefore many insurance companies invest in instruments with a higher rating. In comparison with developed markets, we see that the average weighted credit quality of fixed-income instruments (mainly deposits and bonds) in the portfolios of insurance companies in Kazakhstan varies approximately in the rating category "B" to "BB", which refers to the non-investment category, although we see that some insurance companies invest in government securities quasi-government instruments as more reliable.

Conclusions

The formation of a socially oriented market economy in the Republic of Kazakhstan required a radical change in the principles of managing, attracting new and improving traditional tools for managing the economy (Kindurys V. 2011). In modern conditions, as evidenced by best practice, the most effective is the insurance system, which is the most important category of a system of market economic relations and is designed to protect the property interests of citizens and economic entities by market methods.

An essential condition for the normal development of the state is to ensure the safety of society in a market economy. In the conditions of the functioning of the market, the state ceases to be liable for compensation for damage to business entities and citizens in the event of adverse events, natural disasters and catastrophes. The tool that can compensate for losses in the process of market relations is insurance. The results of the provision of insurance services are an important factor in stimulating the economic activity of hotel entities and have a positive effect on the entire economy of the republic as a whole.

Kazakhstan received high marks in a survey conducted by Ernst & Young. According to the EY 2016 study, "investor confidence in Kazakhstan's potential is also at a record high: 47.3% of respondents expect Kazakhstan to become more attractive over the next three years. The main reasons for its attractiveness were the high level of economic, political and social stability and the competitive corporate tax rate in Kazakhstan. A 2017 OECD investment policy review noted that "big steps" were taken to open up opportunities for foreign investors and improve the policy of attracting FDI (OECD Investment Policy Reviews 2017).

Therefore, the leaders of insurance companies face many challenges. Political and regulatory changes in the world are transforming a number of basic rules for operating insurance companies. Innovation and high expectations of customers are a factor accelerating the change in business practices, and new advanced insurance companies are striving to take the place of traditional market participants. In particular, insurance companies are trying to keep pace with the development of technology in the field of insurance. From the perspective of today, the extremely important role of the insurance market in creating conditions for the stable functioning of the economy predetermines increased attention to aspects of insurance. In modern conditions, insurance is a tool to protect the interests of society and entrepreneurship and a supplier of investment capital for the country's economy. This is the two main role-playing functions of the insurance market. In addition, insurance is the only way to transfer the burden from budgets of all levels in the aftermath of emergency situations to extrabudgetary funding mechanisms.

Based on the results obtained, it can be concluded that the insurance market of the Republic of Kazakhstan today, first of all, depends on global economic development trends and on the productivity of bank lending to individuals in the state.

In general, characterizing the current state of the insurance market and the methods that are used in investment insurance of the Republic of Kazakhstan, we can talk about the need for a comprehensive study and development

of the problems of forming the organizational, managerial and financial potential for sustainable development of the national insurance market. The methodology of sustainable development of the insurance system should be based on the strategy and goals of the country's socio-economic development. On the basis of the chosen strategic goals for the development of the national economy, its priorities and basic guidelines, as a socially oriented market economy, a theoretical and methodological basis for the development of the insurance business, the formation of its sustainable growth should be developed.

Therefore, the fundamental principles and methods of organizing the activities of the insurance business, questions of mechanisms and criteria governing the activities of the insurance market and reflecting strategic goals and objectives for the qualitative development of the national insurance system, form the basis of this study.

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EXPERT ASSESSMENT OF ENTREPRENEURIAL ACTIVITY DEVELOPMENT: A CASE STUDY

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Abstract. This article is devoted to the problem of stimulating the entrepreneurial activity of the population, contributing to the development of the country's economy through new goods and services formation, as well as the development of new industries and markets. The paper presents the results of a study of the business environment of the Republic of Kazakhstan based on expert opinions, namely the factors that can have a stimulating or deterrent effect on the development of the population's entrepreneurial activity. The authors of the article analyzed the structural conditions and indicators of the country's entrepreneurship in the context of the Global Entrepreneurship Monitor's rating. In order to increase the practical orientation of the research, the goal of this article was to integrate theoretically the most significant business development factors in Kazakhstan and determine the level of entrepreneurial activity. A survey of entrepreneurs and specialists whose activities are related to the formation of business conditions was conducted to achieve the set goal.

Keywords: entrepreneurship; entrepreneurial activity; factors; business environment

1. Introduction

Entrepreneurship has long been an important element of economic development. There are a number of empirical studies devoted to defining the concept of entrepreneurship and analyzing the positive relationship between business activities and economic indicators. An entrepreneur is most often defined as a person who tries to do something new, visualizes business opportunities, provides the necessary resources for creating a business and carries risks (Schumpeter, 2007; Cole, 1946; Wilken, 1981; Timmons, 1999; Drucker, 2007; Koh, 1996; Flora, 2006). As an innovator, an entrepreneur introduces new products and production technologies to the market, explores new markets for existing products, develops new marketing strategies, etc. (Steyaert, Hjorth, 2003;

Zhuravleva, 2005).

Entrepreneurship contributes to capital formation by pooling savings and investment; provides wide employment opportunities and increases the purchasing power of the population, creates conditions for the prosperity of society; contributes to a balanced regional development in the country; helps to reduce the concentration of economic power in the hands of a single person (Bukhantseva, 2011; Votchel, 2017; Voynova, Savel'eva, 2012; Orynbassarova et al, 2019; Kafaji, 2019; Khyareh et al., 2019). Entrepreneurs' consumer offers in the form of new goods and services lead to new employment, which can result in a cascading effect in the economy, contributing to an increase in national income due to higher tax revenues, and can be used for investment in other sectors and human capital (Asaul, 2013; Dabson, 2006; Shah, 2007).

2. Research background

Entrepreneurs make a significant contribution to the country's national income. New and improved offers, products or technologies from entrepreneurs allow developing new markets and creating new wealth. This leads to an improvement in the quality of life, as well as an increase in morale and economic freedom. Therefore, the interest of governments in the development of entrepreneurship is quite justified.

However, world practice shows that there are significant differences in the entrepreneurial activity of different countries, depending not only on the characteristics of regional mentality, but also on a number of factors that can both stimulate and hinder its development (Orlova, Ahmadbekova, 2017; Shakhovskaya, 2016; Medvedeva, Kutsova, 2017; Aleksandrova, Verkhovskaya, 2016; Shevyakova et al., 2019; Singgalen et al, 2019; Pinem, R.J. 2019).

Therefore, the purpose of this study is to determine the methodology for calculating the level of entrepreneurial activity with regard to the most significant factors in the development of entrepreneurial activity in Kazakhstan based on expert opinions.

The development of entrepreneurship in Kazakhstan is a priority task of the state economic policy. The state of development of entrepreneurial activity in the country is characterized by positive dynamics. The share of the number of active entrepreneurs in Kazakhstan is 74.4% (Figure 1).
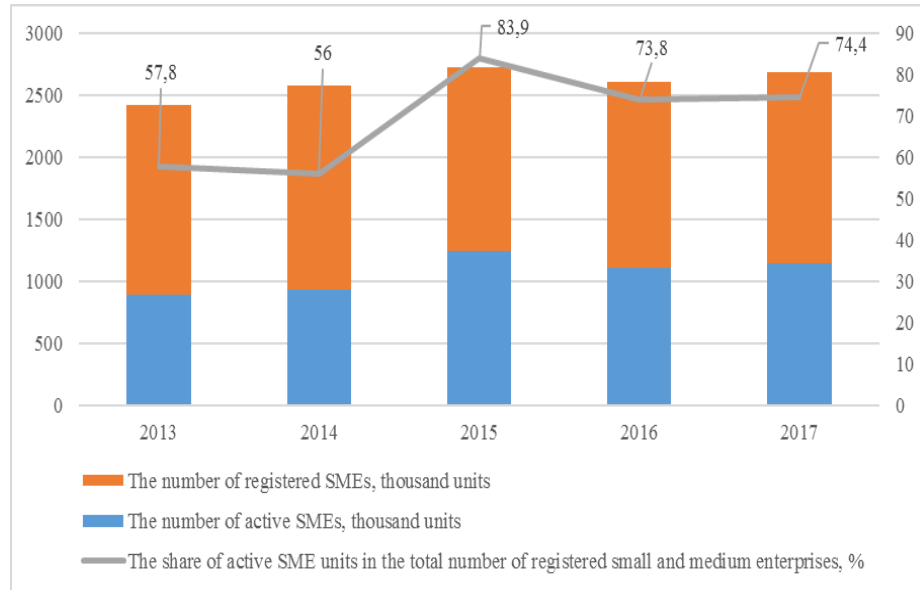
Figure 1. The share of active small and medium enterprises (SME) units in the total number of registered small and medium enterprises

Source: compiled by authors according to Small and medium entrepreneurship in the Republic of Kazakhstan. Statistical collection. Astana 2018

In the sectoral section, the largest number (67%) of SMEs are concentrated in trade, agriculture and other services. In the regional context, the majority of SMEs are concentrated in the cities of Almaty and Nur-Sultan, as well as in Almaty, Turkestan and East Kazakhstan regions. These regions mainly specialize in the provision of services and agriculture.

In contrast to the characteristics of the number of active entrepreneurs, the contribution of small and medium enterprises to the economy of Kazakhstan is significantly lower. Small and medium businesses in Kazakhstan generate 26.8% of the gross domestic product (GDP), and the share of employees in SMEs is 36% of the national labor market (table 1).

Table 1. Main indicators of entrepreneurship development in Kazakhstan for 2013-2017

Indicator	2013	2014	2015	2016	2017
The share of small and medium-sized enterprises in GDP, as a percentage	16,7	25,9	24,9	26,8	26,8
Registered subjects of small and medium enterprises, thousand units	1536	1655,4	1481,5	1498,2	1540,6
Active subjects of small and medium enterprises, thousand units	888,0	926,8	1242,6	1106,4	1146,0
The number of people employed in small and medium enterprises, thousand people	2576,9	2811,0	3183,8	3166,8	3190,1
Production output by small and medium enterprises, million tenge	9165412	15568081	15699405	19609010	23241125

Source: compiled by authors according to Small and medium entrepreneurship in the Republic of Kazakhstan. Statistical collection. Astana 2018

According to table 1, we observe a positive trend in the number of active entrepreneurs in Kazakhstan, which in turn had a positive effect on the indicators of employment, productivity and, accordingly, the proportion of small

and medium businesses in the country's GDP. Over the past 5 years, the number of active entrepreneurs has increased by 29%. Such dynamics is due to government support for business, in particular, preferential financing (Figure 2).
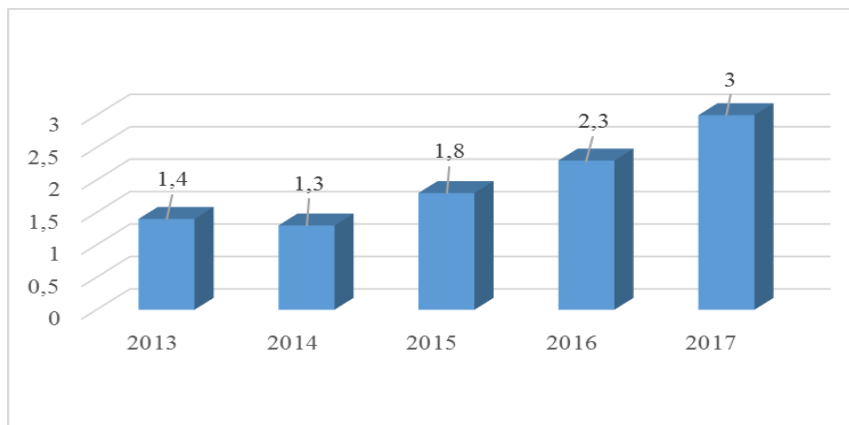

Figure 2. The volume of lending to small and medium-sized businesses
Source: compiled by authors according to Small and medium entrepreneurship in the Republic of Kazakhstan. Statistical collection. Astana 2018

Since 2015, there has been an active growth in lending to SMEs. The number of loans issued by banks has increased 2.3 times since 2014. Compared to 2016, the volume of loans increased by 29% and amounted to 3 trillion tenge.

On the scale of the national economy, the popularity of entrepreneurship in Kazakhstan is increasing, but the pace of activity is quite small: levels of entrepreneurial activity in the Republic of Kazakhstan are two times lower than the world average (63% of GDP and 47% of the number of employees).

In accordance with the Global Entrepreneurship Monitor's assessment of national entrepreneurial framework conditions, the highest rates among those considered in Kazakhstan in 2016 are the availability of physical infrastructure (6.0), government policies (5.3), commercial and legal infrastructure (5.2), as well as cultural and social norms (5.1), and the lowest – primary and secondary education (3.0), R&D transfer (3.1). While in comparison with 2014 there is an increase in the levels of all indicators, in comparison with 2015 there is a certain decrease in a number of indicators. Moreover, while in terms of national policy regulation, primary and secondary education, post-secondary education, as well as commercial and legal infrastructure the decrease is insignificant (within 0.1-0.2), in terms of internal market dynamics it is significant – 1.3.

The positive dynamics of indicators is noted in terms of entrepreneurship financing. If in 2014 and 2015 this indicator was lower than the average regional, in 2016 the Kazakhstan indicator exceeded the Central Asian indicator by 0.3 points, and the world average indicator – by 0.7. Noticeable growth is observed in terms of general national policy. This rating is higher than the average regional by 0.6 points, the world average – by 1.1, and lower than the highest world level, which belongs to France, by 0.6 points. One can also note the increasing influence of state programs, whose indicator has increased by 1.68 over the past two years and amounted to 4.6. However, the general development of entrepreneurship in Kazakhstan is not characterized by high rates, which determines the relevance of this study.

3. Materials and methods

For the analysis of entrepreneurial activity in the Republic of Kazakhstan in the period from September to December 2018, an expert survey was conducted. The main differences between the expert method and other forms of the survey are the number of respondents: there are always fewer of them than with questionnaires and even interviews and quality of respondents: skill level, knowledge of special area they have several orders of magnitude higher than that of ordinary respondents. The objectives of the survey were: to assess the business environment; to identify the stimulating and constraining factors for the development of entrepreneurial activity; to identify the subjects contributing to increased entrepreneurial activity; to identify the promising areas for the development of entrepreneurial activity. The questionnaire included 13 questions of a closed type; 6 questions could include one's own answer. It was drawn up in two forms: printed and electronic, using the Google Forms. Questionnaires were sent to 20 travel agencies, 10 hotels, to the business administration of all regions of the country, 3 to the research institute of the economy. In addition, personal contacts were used. As a result, 46 responses were received.

We admit that the study is not representative; we claim that it is limitation of our research. We treat the research as a case study analysis.

Thus, the amount of respondents participated in the survey, whose activities were either directly related to the implementation of a particular business, or in a certain way were related to entrepreneurship. Thus, the respondents' fields of activity were as follows: entrepreneurs - 52%; representatives of state structures - 20%; representatives of financial institutions - 15%; scientists - 13%.

State structures were represented by employees of the Government of the Republic of Kazakhstan and regional business departments. Employees of the National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken", "DAMU" Entrepreneurship Development Fund" JSC, and leasing companies took part in the survey on the part of financial institutions. The questionnaire also involved scientists whose interests are related to the problems of entrepreneurship in Kazakhstan. Almost half of the respondents are well-established entrepreneurs and professionals in the market (up to 10 or more years of experience) (Figure 3).
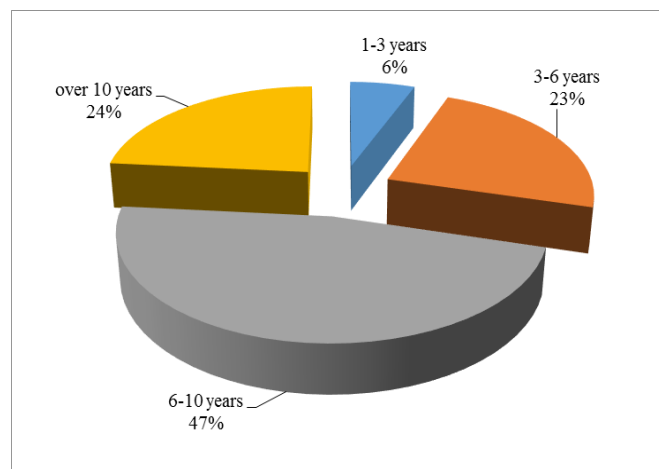

Figure 3. Distribution of the respondents by work experience
Source: compiled by authors

The entrepreneurs who took part in the survey represented various sectors: tourism (7 people), trade (6 people), production (3 people), catering (4 people), construction (2 people), leisure industry and transportation (1 person).

4. Results and Discussion

According to the experts, active entrepreneurs are those who have a positive dynamics of profits from their activities (21%) and expand the range of their goods/services (20%) (Figure 4). A positive profit is not obtained immediately, but its dynamics can be assumed to be formed with a life cycle of more than 10 years. This fact was confirmed by 16% of the respondents.
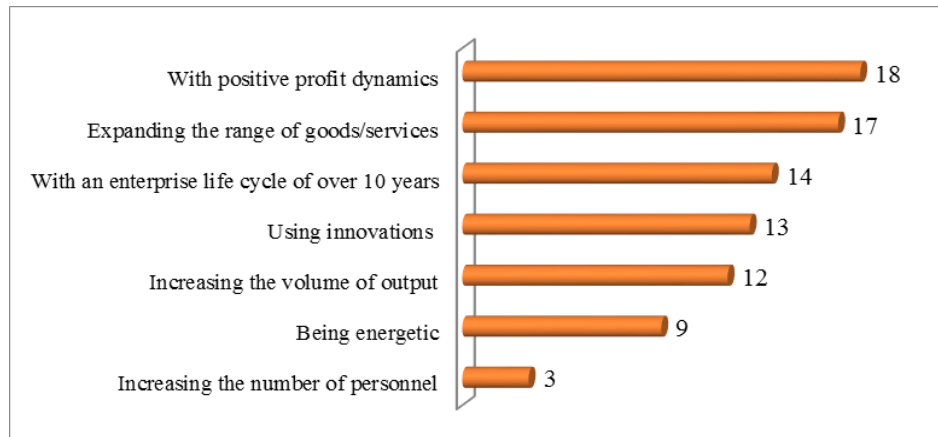
Figure 4. Characteristics of an active entrepreneur
Source: compiled by authors

Another determining factor of an active entrepreneur is the use of innovations (15%), which is one of the ways to expand the range of goods/services. Thus, one can see the close relationship of factors in the ranking. The characteristic of an active entrepreneur also includes increasing the volume of output (14%), being energetic (11%), and increasing the number of personnel (3%).

The respondents were asked to rank the business environment factors in order of importance. Accordingly, the most significant business environment factors were as follows: financial support; education and professional training; regulatory framework (including tax regulation and taxation, registration procedure); economic climate; propensity for entrepreneurship. The least significant business environment factors were the intensity of competition; cultural and social norms; differences in the functioning of small, medium and large businesses; R&D development and internationalization (Figure 5). The low assessment of the significance of the R&D development level looks at least strange, since the use of innovations was noted by the respondents as a characteristic of an active entrepreneur.
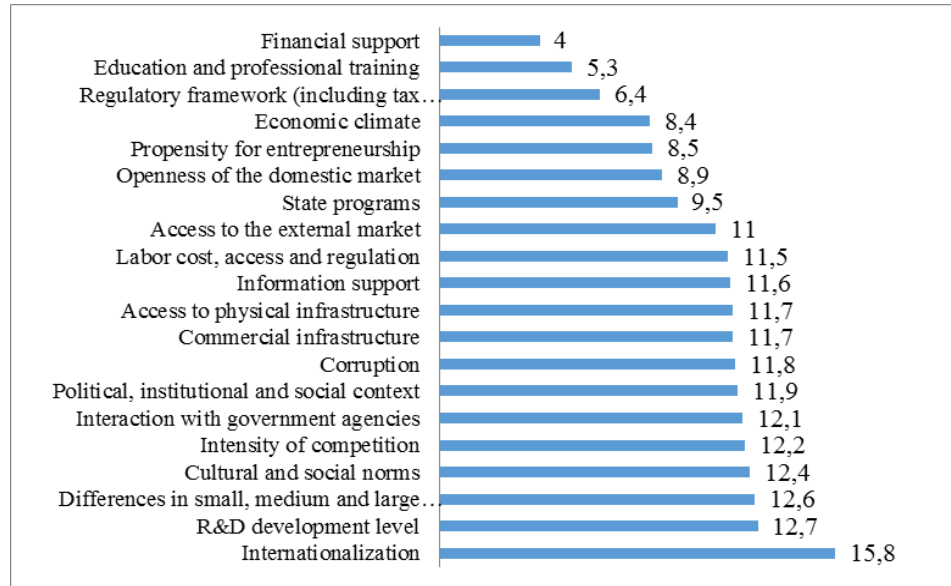
Figure 5. The results of ranking of the business environment factors (1 – the most significant, 20 – the least significant)
Source: compiled by authors

When assessing the business environment factors in Kazakhstan on a 5-point scale, the average score was 3.4 points (see Figure 6). State programs and differences in the functioning of small, medium and large businesses received the highest score – 3.74 points and 3.7 points, respectively. The assessment of the above-mentioned most significant business environment factors indicates the insufficient or unfocused financing of entrepreneurial activity, the low professional training of specialists, the immaturity of the regulatory framework, as well as the low proportion of the population inclined to engage in business.
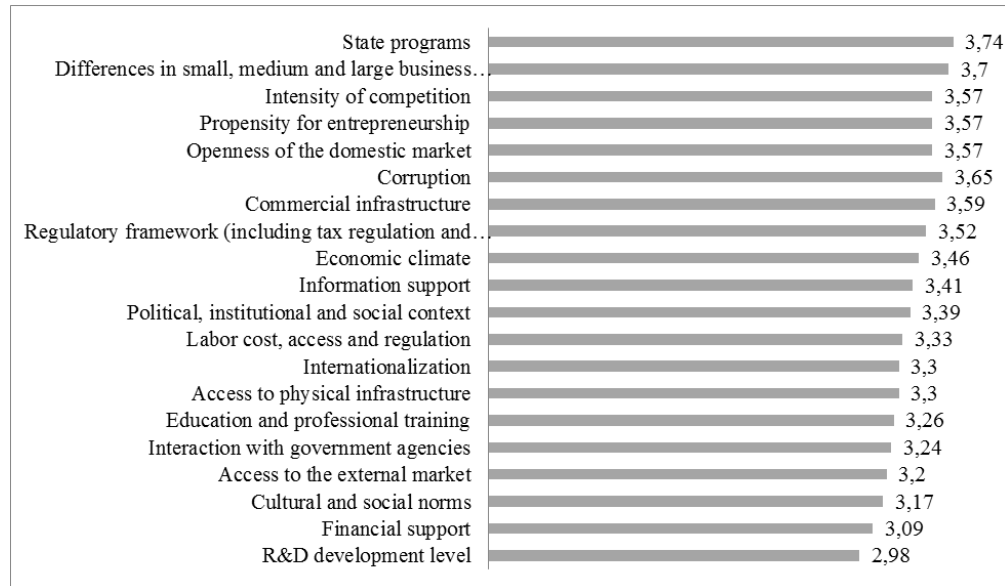
Figure 6. Assessment of the level of business factors development in Kazakhstan
(1 – not developed, 5 – developed)
Source: compiled by authors

The main subjects of the entrepreneurial market were identified: governmental organizations, local executive authorities, professional training/retraining institutions, research institutions, financial institutions, mutual insurance companies, public funds, investment funds, non-governmental organizations, technology parks, business incubators, associations of industry business types, state business support funds, marketing services, communication infrastructure. The value of each subject is indisputable, which is evidenced by the uniform distribution of expert votes (see Figure 7).

According to the expert survey, a mechanism to stimulate entrepreneurial activity should include the mandatory participation of local executive authorities (12%), state business support funds (9%), governmental organizations (9%), investment funds (8%), and professional training/retraining institutions (7%). As can be seen, the leading role in increasing entrepreneurial activity is assigned to the state. First of all, according to 59% of the polled experts, the state should be a mediator and guarantor of entrepreneurial activities (see Figure 8). It should be noted that the definition of these subjects as mandatory could provide a solution to the above-mentioned problems in the development of entrepreneurial activity.

Figure 7. Distribution of subjects by mandatory interaction with the entrepreneur for successful business
Source: compiled by authors

Figure 8. The role of the state in business development

Source: compiled by authors

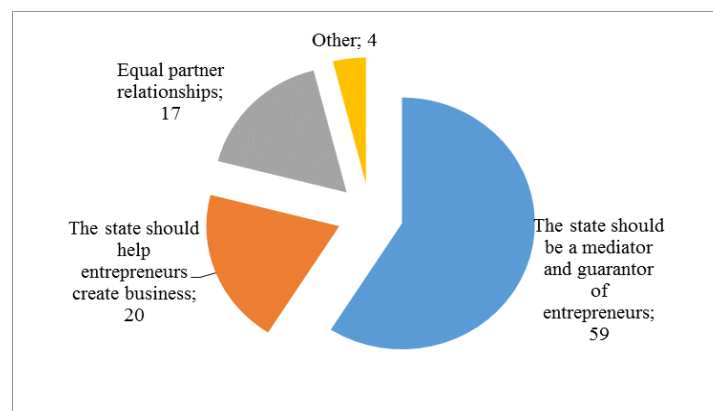Figure 9 presents an expert assessment of the factors constraining and stimulating the development of entrepreneurial activity in Kazakhstan. According to the respondents' answers, corruption is the most constraining factor in the development of entrepreneurship in Kazakhstan (6.93). This is the only factor that has a more negative impact on the business rather than a positive one, although some experts assessed its certain stimulating effect at 3.99 points. For all other factors, there is a preponderance of a positive impact on entrepreneurship.
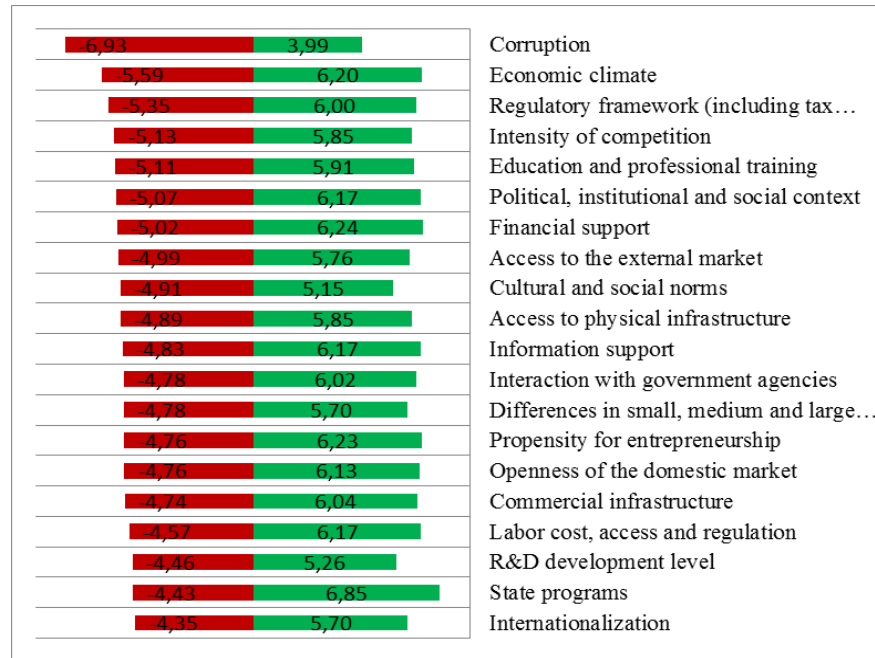
Figure 9. Assessment of the factors constraining/stimulating the development of entrepreneurial activity in Kazakhstan
Source: compiled by authors

Significant differences in the impact on entrepreneurship were observed in relation to state programs (2.42 points), access and cost of labor (1.6 points), propensity for entrepreneurship (1.47 points), and the openness of the domestic market (1.37 points). This conclusion is fully substantiated by the realities of a number of adopted state strategies and programs, namely the Unified Program of Business Support and Development "Business Road Map 2020", "Employment Road Map 2020", the Monotowns Development Program for 2012-2020, the Program for the Development of the Service Sector in the Republic of Kazakhstan until 2020, as well as programs and grants for the creation of new industries and the promotion of entrepreneurship of self-employed, unemployed and low-income population in each single-industry city, giving new opportunities that increase the tendency of the population to business, as well as the openness of the domestic market for the development of entrepreneurship in Kazakhstan.

The goal of the "Business Road Map 2020" program is to ensure sustainable and balanced growth of regional entrepreneurship, as well as to maintain existing and create new permanent jobs. Training and employment of the population, assistance in opening and developing new businesses, optimal distribution of labor resources, and support for employment of the country's population are provided through the "Employment Road Map 2020" program. The development of small and medium businesses to ensure the optimal structure of the population's employment is one of the priorities of the Monotowns Development Program for 2012-2020.

The state also provides free financial support for business ideas related to the production of goods new to Kazakhstan and the provision of new services. The country has also adopted programs for the creation of business support centers that provide advisory and informational support as well as free training in the basics of entrepreneurship.

The most promising areas for doing business in Kazakhstan is the tourism sector (20%) and production (19%) (see Figure 10). It should be noted that the formation of tourist services involves the interaction of various spheres, such as the organization of leisure and entertainment (17%), catering (9%), accommodation (4%). Therefore, it can be assumed that the preference of the offer of tourist services in Kazakhstan as a whole is 50%. In addition, growing demand (28%) and state support (17%) were identified as the determining factors in these areas (see Figure 11).
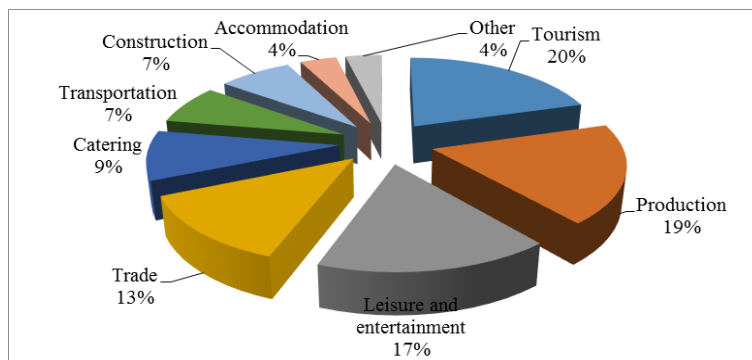

Figure 10. Attractiveness of areas for business development in Kazakhstan, %
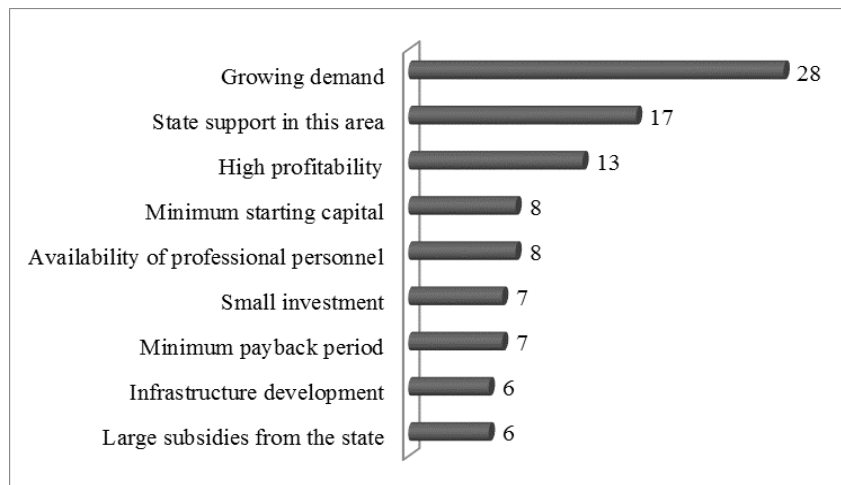*Source:* compiled by authors

Figure 11. Attractiveness factors of business areas, %
Source: compiled by authors

5. Mathematical expression

In order to identify the most significant factors of entrepreneurial activity, a formula for determining significance intervals was used:

$$i = \frac{X_{max} - X_{min}}{n},$$

Where:
i is the interval between groups,
X_{max} and X_{min} are the maximum and minimum values of attributes in total,
n is the number of groups formed.

Five groups were singled out with the following significance level: very strong, strong, moderate, weak and very weak. The interval in our analysis is 2.36 points. Accordingly, the interval for the five groups in terms of significance was: 4-6.36 – very strong; 6.37-8.72 – strong; 8.73 – 11.08 – moderate; 11.09 – 13.44 – weak; 13.45 – 15.8 – very weak.

As a result, five factors were determined: with very strong significance - financial support (4.0), education and professional training (5.3); with strong significance - the regulatory framework (6.4), the economic climate (8.4) and propensity for entrepreneurship (8.5) (Table 2). Based on the significance level of these factors, the coefficients of the corresponding indicators were determined, the sum of which gives a unit. The assessment of the significance of individual indicators allowed identifying the method for assessing the level of entrepreneurial activity (Aimagambetov 2016).

Table 2. Basic data for identifying the method of assessing the level of entrepreneurial activity (ranking)

Parameter	Assessment letter	Average value (rank)	Data reduction $(15,8 - avg_{RANK})$	Indicator share
Financial support	a	4,0	11,8	0,25
Education and training	b	5,3	10,5	0,23
Regulatory framework	c	6,4	9,4	0,20
Economic climate	d	8,4	7,4	0,16
Propensity for entrepreneurship	e	8,5	7,3	0,16
Total:		32,6	46,4	1,00

Source: compiled and calculated by authors

Thus, the method of calculating the level of entrepreneurial activity takes the form:

$$EA = 0,25a + 0,23b + 0,2c + 0,16d + 0,16e$$

Where:

EA is the level of entrepreneurial activity with regard to the expert assessment ($\leq |1|$);

0,25 is the coefficient of significance of the "financial support" parameter;
a is the expert assessment of the "financial support" parameter; 0,23 is the coefficient of significance of the "education and training" parameter;

b is the expert assessment of the "education and training" parameter;
0,2 is the coefficient of significance of the "regulatory framework" parameter;
c is the expert assessment of the "regulatory framework" parameter;
0,16 is the coefficient of significance of the "economic climate" parameter;
d is the expert assessment of the "economic climate" parameter;
0,16 is the coefficient of significance of the "propensity for entrepreneurship" parameter;
e is the expert assessment of the "propensity for entrepreneurship" parameter.

Using the assessment values of entrepreneurship factors obtained by the expert survey, one can determine the level of entrepreneurial activity in Kazakhstan:

$$EA = 0,25*3,09 + 0,23*3,26 + 0,2*3,52 + 0,16*3,46 + 0,16*3,57 = 3,35 .$$

The application of mathematical models for forecasting the target indicators of the country's development program in the context of the sustainable development paradigm will have a beneficial effect on the entire management process and will contribute to improving the quality of development planning in the Republic of Kazakhstan, developing programs and their implementation (Yemelina and Omarova 2018).

Conclusions

Thus, a significant reserve of increase in entrepreneurial activity is evident due to the introduction of measures contributing to an increase in the assessment levels of the indicators taken into account. In our opinion, the advantage of the proposed approach is the logical relationship between individual indicators of entrepreneurial activity factors and the level of entrepreneurial activity. The practical significance of this approach consists in the possibility to obtain a model of entrepreneurial activity as close as possible to reality and to determine and forecast its level on the basis of expert assessments.

The integral indicator, which is an aggregated form of individual indicators, incorporates the most important final criteria for entrepreneurial activity, combining the most significant factors of entrepreneurial activity, which ultimately ensures the maximum accuracy of the expected results. Thus, the proposed method for assessing the level of entrepreneurial activity is a fairly universal tool that allows it to be widely used both in theoretical studies and in the practice of economic analysis.

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INFLUENCE OF SOCIAL PARTNERSHIP ON THE DEVELOPMENT OF ENTERPRISE: ON THE EXAMPLE OF OIL INDUSTRY

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Abstract. At the present stage of development, global trends are characterized by updating the content and modernization of the forms of labor activity, organization of production and management. This finds expression in the organization of social partnership. The accumulated potential of theoretical knowledge and practical experience on the issue under study is crucial for the development of ways and mechanisms of interaction between the state and business, especially in the oil industry of Kazakhstan. The article discusses the impact of social partnership on the development of enterprises on the example of the oil industry of the Republic of Kazakhstan, as a socio-political institution that ensures the interaction of the state, business, and trade unions in modern Kazakhstani society. The analysis of the interaction of subjects of social partnership both in the field of labor relations and in the sphere of public relations is carried out, the institutional capabilities of the oil industry enterprises as subjects of social partnership, the importance and impact of social partnership policies on the democratization processes, social and political stability of Kazakhstani society are analyzed.

Keywords: oil industry; social partnership; trade union; system; management

1. Introduction

Social partnership is a special ideology and idea of the nature of the interaction of classes in a market-capitalist economy, which was formed within the framework of the social democratic, reformist movement in the labor movement (Mukhambetova 2014).

The content of the term "social partnership" in the scientific literature is defined ambiguously. So, for example, some researchers, such as L.A. Gordon, consider social partnership as a method and mechanism for regulating social and labor relations, resolving contradictions between workers and employers (Gordon 2015).

2. Literature review

Other researchers, such as S.P. Peregudov, believe that this is one of the most common types of corporatism of neo-corporate relations that arise between representatives of three main subjects - business, trade unions and the state. At the same time, they classify social partnerships according to various systems: "tripartism", "bipartism", micro- and mesocorporatism (according to the levels of individual corporations, industries and regions) (Peregudov 2016).

Vetrov A.V. characterizes social partnership as a complex social phenomenon, a multifaceted contradictory social process that arises between workers, employers and government (Vetrov 2015).

The most radical researchers, such as M. Voeikov, I. Lashchinsky, who hold the idea of the inevitability of social conflicts in the manufacturing sector, argue that the interests of owners-employers can be satisfied only at the expense of the interests of workers (Voeikov and Lashchinsky 2016).

I.N. Sycheva notes that social partnership is a collaborative method of achieving goals and interests in social and labor relations by staff and employers " (Sycheva 2016).

According to Leontieva A. G., social partnership is a special system of relations between staff and employers with the regulatory role of the state, which is aimed at coordinating material interests and resolving social and labor conflicts, effectively operates within the framework of the relative balance between labor and capital (Leontieva 2017).

In his publications Pshenichny S.P. writes that social partnership as a system of interaction between the state, business and civil society is under the close attention of modern researchers and is considered as an interdisciplinary concept and affects both the social and economic sphere of society (Pschenichny 2015).

Taking into account international experience, in recent years in Kazakhstan a multilevel system and the legislative basis of social partnership have been formed. The current legal framework serves as the basis for partnerships and balancing the interests of workers and employers, and provides a civilized procedure for building and regulating labor relations between the main subjects of the labor market: employers, employees and the state (Ministry of Labor).

According to the definition of the Federation of Trade Unions of the Republic of Kazakhstan, social partnership is a system of relations between: workers (representatives of employees), employers (representatives of employers), and government bodies aimed at ensuring coordination of interests on issues of regulation of labor and socio-economic relations and is provided in the form of interaction between the parties through social partnership bodies:
- at the republican level - by the Republican tripartite commission on social partnership and regulation of social and labor relations;
- at the industry level - by industry commissions for social partnership and the regulation of social and labor relations;
- at the regional (regional, city, district) level - by regional, city, district commissions for social partnership and the regulation of social and labor relations (Table 1) (Federation Trade Union).

Table 1. Forms of interaction between the parties through social partnership bodies in the Republic of Kazakhstan

Levels	Parties	Apparatus	Instruments
Republician	Government of the Republic of Kazakhstan, NCE (National Chamber of Entrepreneurs)	Republican Tripartite Commission	General agreement
Industry	Ministry, Sectoral Trade Union, NCE (National Chamber of Entrepreneurs)	Industry Tripartite Commission	Industry agreement
Regional	Akimat, territorial union of trade unions, NCE (National Chamber of Entrepreneurs)	Regional Tripartite Commission	Regional agreement
Enterprise	Trade union, employer	Bilateral Commission	Collective agreement

Source: compiled by authors according to Data of the Federation of Trade Unions of the Republic of Kazakhstan www.fprk.kz

We can agree with the opinion of Aitbay K., who in his publications notes that the development of social partnership in its various forms is an important part of the process of strengthening the social orientation of the modern market economy. It is the conditions of social partnership that are considered as a kind of public shock absorber for tough market realities, since they combine the requirements of economic efficiency and the interests of social justice (Aitbay 2014).

Recently, social partnership is acquiring new features, being present not only in the labor sphere, but also manifesting itself as a new social phenomenon, the essence of which lies in the process of intersectoral interaction of government bodies, business and non-governmental organizations in order to resolve the most pressing social problems of society, as in national and local level.

In general, according to A. Amrebaev, over the years of the country's independent development, legislative support has been provided for decent work, a new model for regulating labor relations has been adopted that provides the optimal combination of protecting labor and social rights with economic feasibility, and an institutional and legal framework has been formed for the development of social partnership (Amrebaev 2015).

Shaltykov A.I., studying the problems of social partnership in Kazakhstan, claims that today Kazakhstan has developed certain mechanisms for the formation of a system of social partnership in the world of work:
- legislative registration of social partnership in the laws and regulations of the republic;
- the ongoing negotiation process between representatives of workers (trade unions), associations of employers and public authorities;
- permanent commissions (tripartite) on the regulation of social and labor relations;
- normative consolidation and compliance with the procedures for harmonizing the interests of the parties;
- a system for monitoring the implementation of adopted agreements and contracts (Shaltykov 2015).
The wise use of instruments of social partnership allows the state to reduce the budget load, ensure the development of infrastructure, increase the level of employment, develop private entrepreneurship and, at the same time, improve the quality of goods and services.
Thus, social partnership is one of the ways of civilized, peaceful coexistence of the state, business and civil society, maintaining social stability of the society.

3. Methodology

Today's Kazakhstani practice shows that the level of development of partnerships of various socio-political groups largely depends on the ability of the state to regulate the process of establishing a system of social

partnership. Today, our state is working to ensure employment and reduce poverty in the country. For this purpose, active measures to promote employment, the organization of public works, vocational training for the unemployed, microcredit and much more are widely used. At the same time, the country has developed numerous programs to combat poverty, programs aimed at creating new jobs, etc.

Social partnership involves material and moral stimulation of the interest of employees in the growth of production rates, labor productivity in the name of providing the conditions necessary for the growth of employers' profit and gross domestic product, improving the level and quality of life of workers themselves. Complementing this palette is the opening of new enterprises with appropriate working conditions and, as a result, the creation of new jobs.

Social partnership has a great influence on the development of enterprises, including enterprises of the oil industry of the Republic of Kazakhstan. Studying the impact of social partnership on the oil industry, we note that the oil and gas industry plays an important role in the economy of Kazakhstan and is one of the main drivers of the country's GDP growth, reflecting the significant dependence of the economy on industry revenues.

In order to ensure stable and efficient activity of industry organizations in accordance with the Constitution of the Republic of Kazakhstan, the labor legislation of the Republic of Kazakhstan, the Law of the Republic of Kazakhstan "On Trade Unions", the Conventions of the International Labor Organization ratified by the Republic of Kazakhstan, a Sectoral Agreement on social partnership in oil and gas, oil refining was developed and concluded and petrochemical sectors of the Republic of Kazakhstan for 2017-2019, which provides for the procedure, the main the principles of remuneration of labor, social guarantees, compensation and benefits, as well as the development of social partnership in Kazakhstan (Industry agreement, Constitution, Law on Trade).

According to the Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan, as of January 2019, 297 companies engaged in the production of coke and oil products are registered in Kazakhstan, of which 173 are active. Of the total number of companies engaged in the production of coke and oil products, they are divided into:
- Large enterprises (employees of more than 250 people) - 7 (including 7 operating);
- medium-sized enterprises (from 101 to 250 people) - 10 (7);
- small enterprises (from 5 to 100 people) - 280 (159) (Committee of Statistics).

By geography, the location of companies in the country is as follows:
- Almaty city - 89 (of which 52 are active);
-Mangistau region - 30 (17);
- Aktobe region - 27 (9);
- Kyzylorda region - 14 (8);
- Zhambyl region - 13 (9).

At the beginning of 2019, the actual number of enterprises in the production of coke and oil products amounted to 8.1 thousand people. The largest regional population (67.9%) is concentrated in Atyrau, Pavlodar regions and the city of Shymkent. This is due to the fact that in these regions there are 3 large domestic oil refineries - the Atyrau Refinery (Atyrau), the Petroleum Refinery (Pavlodar) and the PKOP (Shymkent).

The number of employees in this area will increase significantly if we take into account the employees of enterprises for the extraction of crude oil and natural gas, which are engaged in gas processing and sale of oil and gas.

The attractiveness of the oil and gas sector is still high due to the corresponding level of competitiveness of wages in the industry. The average monthly nominal wage of one employee for the production of coke and oil products at the end of 2018 amounted to 386 966 tenge, or 165.1% of the average monthly nominal wage for one worker throughout the industry (234 413 tenge). According to this indicator, the sector under consideration is in third place, the first two places are occupied by the extraction of crude oil and natural gas and the production of tobacco products.

The salary fund for workers in the production of coke and oil products for 2018 amounted to 37.4 billion tenge (2.2% of the salary fund for workers throughout the industry). The salary fund for workers in the production of coke and oil products in 2018 compared to 2014 increased by 46.6%, throughout the industry this indicator increased by 24.6% (JSC KIO).

4. Results and discussions

In Kazakhstan, in 2018, 90.4 million tons of oil and gas condensate were produced, which is a historically record volume for the country (4.8% more than in 2017) (Table 2).

Table 2. Indicators of oil production by enterprises of the oil industry of the Republic of Kazakhstan for the period from 2012 till 2019

Indicator	Unit	Years						
		2012	2013	2014	2015	2016	2017	2018
Oil production	in mln tonnes	79,2	81,8	80,8	79,5	78,0	86,2	90,4
GDP	in US dollars	208,0	236,6	221,4	184,4	137,3	159,4	184,2
Shipment to the domestic market	% to the volume of production	15,8	16,0	16,3	17,8	16,8	15,4	15,9

Source: compiled by authors according to Industry Analysis Report. Kazakh Institute of Oil and Gas JSC - Nur-Sultan, 2019 - p. 18

The decline in world oil prices from $ 98 in 2014 to $ 53 in 2015 and $ 44 in 2016 and a slight decline in its production slowed economic growth from 4.1% in 2014 to 1.2% and 1% in 2015 and 2016 years.

Effective development of oil and gas fields is impossible without a full and comprehensive modeling of processes characterized by indicators of oil production. Therefore, we consider it necessary, in our study, to implement a multifactor model that allows us to forecast the development of the main factors listed in Table 2 above that set the level of the development trend of oil production by enterprises of the oil industry of the Republic of Kazakhstan for the period from 2012-2018.

Multivariate analysis refers to the methodology of a comprehensive and systematic study and measurement of the impact of factors on the value of effective indicators.

In studying the laws of economic phenomena, it is of great importance to identify the relationships between interrelated phenomena that develop over time, and conduct a related analysis of the dynamics. For this purpose, multi-factor models of interconnected time series are being constructed.

To develop a model, we use the method of correlation and regression analysis. Correlation represents the likely relationship between indicators that are not in a functional relationship. This method is used to determine the tightness of the relationship between indicators.

The multiple regression equation can be represented as:

$$Y = f(\beta, X) + \varepsilon \tag{1}$$

where:

$X = X(X_1, X_2, ..., X_m)$ - vector of independent (explanatory) variables;

β - vector of parameters (to be determined);

ε - random error (deviation);

Y - dependent (explained) variable.

The theoretical linear equation of multiple regression has the form:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + ... + \beta_m X_m + \varepsilon \tag{2}$$

where:

β_0 - the free term that determines the value of Y, in the case when all the explanatory variables Xj are equal to 0.

The empirical equation of multiple regression can be represented as:

$$Y = b_0 + b_1 X_1 + b_1 X_1 + ... + b_m X_m + e \tag{3}$$

where:

$b_0, b_1, ..., b_m$ - estimates of theoretical values $\beta_0, \beta_1, \beta_2, ..., \beta_m$ regression coefficients (empirical regression coefficients);

e - deviation estimate ε.

When fulfilling the preconditions of OLS regarding errors ε_i, assessments $b_0, b_1, ..., b_m$ parameters $\beta_0, \beta_1, \beta_2, ..., \beta_m$ multiple linear regression according to least squares are unbiased, efficient and consistent.
To estimate the parameters of the multiple regression equation, OLS is used.

We define the vector of estimates of the regression coefficients. According to the least squares method, the vector s is obtained from the expression: $s = (X^TX)^{-1}X^TY$

Add a unit column to the matrix with variables Xj:

	X_1	X_2
1	79,2	15,8
1	81,8	16,0
1	80,8	16,3
1	79,5	17,8
1	78,0	16,8
1	86,2	15,4
1	90,4	15,9

Matrix Y

208,0
236,6
221,4
184,4
137,3
159,4
184,2

Matrix X^T

1	1	1	1	1	1
79,2	81,8	80,8	79,5	78,0	86,2
15,8	16,0	16,3	17,8	16,8	15,4

Multiply Matrices, $(X^T Y)$

$X^T X =$

7,0	575,9	114,0
575,9	47499,37	9367,54
114,0	9367,54	1860,38

In the matrix, (XTX), the number 6 lying at the intersection of the 1st row and the 1st column is obtained as the sum of the products of the elements of the 1st row of the XT matrix and the 1st column of the matrix X.

Multiply Matrices, $(X^T Y)$

$X^T Y =$

1331,3
109477,76
21653,32

Find the inverse matrix $(X^T X)^{-1}$

$(X^T X)^{-1} =$

271,5	-1,539	-8,885
-1,539	0,0117	0,0352
-8,885	0,0352	0,368

The vector of estimates of the regression coefficients is

$Y(X) =$

271,5	-1,539	-8,885
-1,539	0,0117	0,0352
-8,885	0,0352	0,368

$*$

1331,3
109477,76
21653,32

$=$

514,923
-1,57
-12,012

Regression equation (estimation of the regression equation)

$$Y = 514,923 - 1,5697 \cdot X_1 - 12,0122 \cdot X_2$$

Paired Correlation Coefficients R:

$$r_{xy} = \frac{\overline{x \cdot y} - \overline{x} \cdot \overline{y}}{s(x) \cdot s(y)}$$

$$r_{yx1} = \frac{15639,68 - 82,271 \cdot 190,186}{4,128 \cdot 32,205} = -0,539$$

$$r_{yx2} = \frac{3093,331 - 16,286 \cdot 190,186}{0,738 \cdot 32,205} = -0,167$$

$$r_{x1x2} = \frac{1338,22 - 16,286 \cdot 82,271}{0,738 \cdot 4,128} = -0,535$$

Dispersions and standard deviations

Signs x and y	$D(x) = \dfrac{\sum x_i^2}{n} - \overline{x}^2$	$D(y) = \dfrac{\sum y_i^2}{n} - \overline{y}^2$	$s(x) = \sqrt{D(x)}$	$s(y) = \sqrt{D(y)}$
For y and x_1	17,036	1037,133	4,128	32,205
For y and x_2	0,544	1037,133	0,738	32,205
For x_1 and x_2	0,544	17,036	0,738	4,128

We calculate the observed values of t-statistics for r_{yx1} according to the formula:

$$r_{nabl} = r_{yx1} \frac{\sqrt{n-m-1}}{\sqrt{1-r_{yx1}^2}} \qquad (5)$$

where:

m = 1 - number of factors in the regression equation. $r_{nabl} = 0{,}0539 \dfrac{\sqrt{7-1-1}}{\sqrt{1-0{,}0539^2}} = 0{,}12$

According to the student table we find Ttable
t_{crit} (n-m-1; α/2) = (5; 0,025) = 2,571
Insofar as $t_{nabl} > t_{crit}$, then we reject the hypothesis of equality of 0 correlation coefficient.
In other words, the correlation coefficient is statistically significant
We calculate the observed values of t-statistics for r_{yx2} according to the formula:

$$r_{nabl} = 0{,}17 \frac{\sqrt{7-1-1}}{\sqrt{1-0{,}17^2}} = 0{,}38$$

Insofar as $t_{nabl} > t_{crit}$, then we reject the hypothesis of equality of 0 correlation coefficient. In other words, the correlation coefficient is statistically significant.

Let's move on to the statistical analysis of the obtained regression equation: checking the significance of the equation and its coefficients, studying the absolute and relative approximation errors.

For an unbiased estimate of variance, we perform the following calculations:

Unbiased error ε = Y - Y(x) = Y - X*s (absolute error of approximation)

Y	Y(x)	ε = Y - Y(x)	ε²	(Y-Ycp)²	|ε : Y|
208,0	200,808	7,192	51,723	317,349	0,0346
236,6	194,324	42,276	1787,229	2154,286	0,179
221,4	192,29	29,11	847,366	974,332	0,131
184,4	176,313	8,087	65,402	33,474	0,0439
137,3	190,68	-53,38	2849,383	2796,899	0,389
159,4	194,625	-35,225	1240,79	947,76	0,221
184,2	182,026	2,174	4,727	35,829	0,0118
			6846,62	7259,929	1,01

Estimation of standard deviation (standard error for estimating Y): $S = \sqrt{S^2} = 41{,}372$

The tightness of the combined influence of factors on the result is estimated by the multiple correlation index.
Unlike the pair correlation coefficient, which can take negative values, it takes values from 0 to 1.
Therefore, R cannot be used to interpret the direction of communication. The denser the actual values y_i are located relative to the regression line, the smaller the residual variance and, therefore, the larger the value $R_{y(x_1,...,x_m)}$.

Thus, when the value of R is close to 1, the regression equation better describes the actual data and factors have a stronger effect on the result. With an R value close to 0, the regression equation poorly describes the evidence and factors have little effect on the result.

Multiple correlation coefficient

$$R = \sqrt{1 - \frac{6846{,}62}{7259{,}93}} = 0{,}2386$$

The link between Y attribute and Xi factors is strong

We will calculate the correlation coefficient using the known values of the linear coefficients of pair correlation and β-coefficients. $R = \sqrt{\sum r_{yxi}\beta_{yxi}} = \sqrt{r_{yx1}\beta_{yx1} + r_{yx2}\beta_{yx2}}$ (6)

$$R = \sqrt{(-0,0539)\cdot(-0,201) + (-0,167)(-0,275)} = \sqrt{0,0569} = 0,239$$

The significance of the multiple regression equation is estimated by testing the hypothesis that the determination coefficient calculated from the data of the general population is equal to zero: R2 or b1 = b2 = ... = bm = 0 (the hypothesis of the insignificance of the regression equation calculated from the data of the general population).
To test it, use the Fisher F-test.

In this case, the actual (observed) value of the F-criterion is calculated through the determination coefficient R2, calculated according to the data of a specific observation.

The critical value of the F-criterion (Fcr) is found from the Fisher-Snedocor distribution tables. For this, they are set by the significance level α (usually it is taken equal to 0.05) and two numbers of degrees of freedom k1 = m and k2 = n-m-1.

Let us verify the hypothesis of general significance - the hypothesis of the simultaneous equality to zero of all regression coefficients with explanatory variables:

H_0: $R^2 = 0$; $\beta_1 = \beta_2 = ... = \beta_m = 0$.
H_1: $R^2 \neq 0$.
This hypothesis is tested using F-statistics of the Fisher distribution (right-hand check).
If F <$F_{kp} = F_{\alpha\,;\,n\text{-}m\text{-}1}$, there is no reason to reject the hypothesis H_0.

$$F = \frac{R^2}{1-R^2}\frac{n-m-1}{m} = \frac{0,05693}{1-0,05693}\frac{7-2-1}{2} = 0,121$$

Table value with degrees of freedom k1 = 2 и k2 = n – m - 1 = 7 - 2 - 1 = 4, Fcr(2;4) = 6,94
Since the actual value is F> Fcr, the determination coefficient is statistically significant and the regression equation is statistically reliable (the joint significance of the coefficients for factors x_i is confirmed).

Table 3. Predicted values of indicators of oil production by enterprises of the oil industry of the Republic of Kazakhstan for the period from 2019-2021

Index	2019	2020	2021
Oil production, in million tons	87,929	89,343	90,757
GDP, billion US dollars	145,91	134,85	123,78
Shipment to the domestic market,% of the volume of production	16,229	16,214	16,2

Source: compiled and calculated by authors

As a result of the calculations, the multiple regression equation was obtained:

$$Y = 514,923 - 1,5697\ X_1 - 12,0122\ X_2$$

Possible economic interpretation of model parameters: increase X_1 for 1 unit leads to a decrease Y on average 1,57 units; increase X_2 for 1 unit leads to an increase in Y by an average of 12.012 units. By maximum ratio $\beta_1 = -0,201$ we conclude that the factor has the greatest influence on the result Y and X_1.

The statistical significance of the equation was verified using the coefficient of determination and the Fisher test. It was found that in the studied situation, 100% of the total variability of Y is explained by a change in factors X_1 and X_2. It was also established that the model parameters are statistically weakly expressed.

If we look at the regional aspect of oil production, including gas condensate for the period 2014 - 2018, the predominant part is occupied by the Atyrau and Mangistau regions (Table 4).

Table 4. Indicators of oil production in the regions of Kazakhstan, including gas condensate for the period 2014 - 2018 (thousand tons)

Region	Years				
	2014	2015	2016	2017	2018
Republic of Kazakhstan	80825,6	79456,3	78031,8	86194,4	90354,2
Aktuibinsk	7352,9	6814,1	6202,9	5985,9	5985,5
Atyrau	31943,2	32390,3	33680,7	42230,2	47213,6
West Kazakhstan	13061,0	12748,2	12347,1	13162,4	12691,7
Zhambyl	20,7	18,5	20,8	20,6	18,9
Kyzylorda	9919,8	8974,2	7669,3	6813,9	6393,3
Mangystau	18527,2	18510,1	18110,2	17981,3	18050,9
East Kazakhstan	0,8	0,9	0,9	0,1	0,3

Source: compiled by authors on the basis of the source: Industry Analysis Report of JSC Kazakh Institute of Oil and Gas. Nur-Sultan, 2019. 29p.

As a percentage of the previous year, indicators of oil production in Kazakhstan are also shown, including gas condensate for the period 2014 - 2018, as well as forecast values for the period from 2019-2021, where there is a steady increase in this indicator (Figure 1).
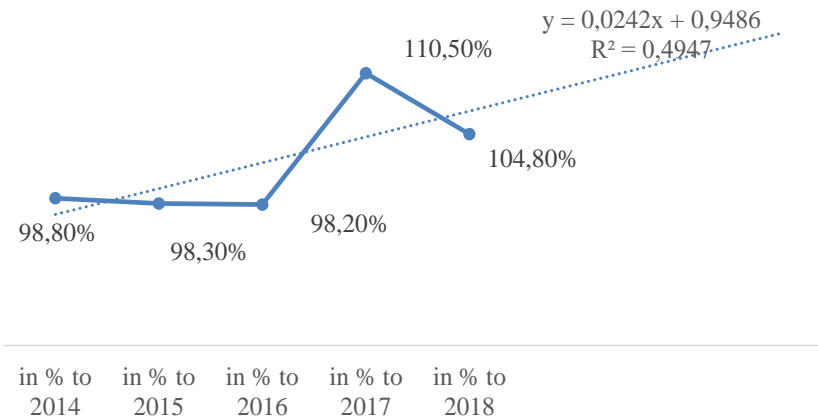

Figure 1. Indicators of oil production in Kazakhstan, including gas condensate for the period 2014 - 2018, as well as the forecast for the next 3 years
Source: compiled by authors

Thus, the priority is the full provision of the domestic market with fuels and lubricants in accordance with the new environmental standards by 2025. We also note the strategic objectives of the development of the oil complex, indicated in the Concept of development of the fuel and energy complex of the Republic of Kazakhstan until 2030:

1) attracting investment in exploration and effective technological development of oil production;

2) ensuring energy security for key types of petroleum products, full coverage of domestic demand for motor fuels and lubricants;

3) consistent liberalization of oil refining and the oil product market;

4) promoting integration into international associations, preparing for integration into the CES;

5) the development of human resources in the oil and gas sector (Aimagambetov and Kuttybaeva 2016).

In 2018, in the oil refining sector, modernization projects for oil refineries were fully completed. The capacity and depth of processing have been increased, the quality of petroleum products complies with European standards K-4, K-5. The volume of oil refining increased by 8.6% compared to 2017 and amounted to 16.4 million tons (including "Condensate" and "CaspiBitum"). It is planned to process 17.2 million tons this year, which is 5% more than in 2018.

The modernization of three large refineries allowed Kazakhstan to get rid of dependence on Russian supplies, moreover, in the summer of 2018, Astana introduced a ban on gasoline import from the Russian Federation in order to prevent overstocking of the tanks of three large Kazakhstani refineries with oil products.

In connection with the development of the oil industry in Kazakhstan, one of the important issues in the development of the oil and gas industry, like any industry, is the issue of its staffing. The attractiveness of the oil and gas sector is still high due to the corresponding level of competitiveness of wages in the industry. Trends in the development of digitalization and automation in the oil and gas industry are leading to the creation of databases and data processing centers (bigdata), which will require retraining of employees taking into account new requirements and knowledge. Today, most production processes at oil and gas enterprises are automated, but at the same time, the person has the right to make the most responsible decisions.

For example, a specialist working with smart field technologies can monitor technological parameters in real time, and also, if necessary, manually control technological processes. "The availability of labor resources for the implementation of the digitalization program in the oil and gas industry remains low. In this regard, training and attracting specialists is one of the pressing issues of the industry. The emergence of new professions and positions related to "intellectual fields" is possible both in the IT and oil and gas sectors.

In this regard, in the near future, key professions will be associated with oil and gas exploration (including drilling exploratory wells, geological and geophysical work, etc.), increasing production efficiency (including through new technologies and applying methods of increasing oil recovery).

In 2016-2017, the Ministry of Energy of the Republic of Kazakhstan, together with the KAZENERGY Association, also carried out work to develop the Sector Qualifications Framework for the oil and gas, oil refining and petrochemical industries, and on March 30, 2017, this ORC was approved at a meeting of the Sectoral Commission on Social Partnership and the Regulation of Social and Labor Relations of the Oil and Gas Industry. In addition, the Order of the NPP Atameken RK No. 312 dated November 20, 2018 approved the professional standards: "Drilling team", "Installation work", "Drilling management". 4. Oil and gas processing companies of the Republic of Kazakhstan in their activities use the industry-wide Qualification Directory of the positions of managers, specialists and other employees, the All-Union Classifier of Occupations of Workers, Positions of Employees and Rate Categories, the Unified Tariff and Qualification Directory of Work and Occupations of Workers and the Classification of Occupations of the Republic of Kazakhstan.

The concept for the development of the fuel and energy complex (FEC) until 2030, developed in June 2014, is a key document that defines the strategic goals of the exploration and production sector. According to this concept, in the future, until 2030, the oil industry will:

1) created economic incentives to attract investment in geological exploration and the effective technological development of oil production;
2) the personnel potential of the oil and gas industry is ensured;
3) technology transfer was provided in the oil production segment;
4) the domestic market for petroleum products is provided, oil refining capacities are expanded;
5) a competitive market for petroleum products and refining is developed.

Currently, Kazakhstan has a comprehensive system for attracting foreign labor:
- quota system for qualified foreign labor and labor immigrants;
- multistage system for issuing work permits.

Within the framework of the Eurasian Economic Union, a regime of free movement of labor resources in the territory of member states is in force.

In 2016-2017, the Ministry of Energy of the Republic of Kazakhstan, together with the KAZENERGY Association, also carried out work to develop the Sector Qualifications Framework for the oil and gas, oil refining and petrochemical industries, and on March 30, 2017, this ORC was approved at a meeting of the Sectoral Commission on Social Partnership and the Regulation of Social and Labor Relations of the Oil and Gas Industry. In addition, the Order of the NPP Atameken RK No. 312 dated November 20, 2018 approved the professional standards: "Drilling team", "Installation work", "Drilling management". 4. Oil and gas processing companies of the Republic of Kazakhstan in their activities use the industry-wide Qualification Directory of the positions of managers, specialists and other employees, the All-Union Classifier of Occupations of Workers, Positions of Employees and Rate Categories, the Unified Tariff and Qualification Directory of Work and Occupations of Workers and the Classification of Occupations of the Republic of Kazakhstan.

Conclusions

Today, partnerships can only be observed in the field of highly qualified rare professions, where employers are willing to make concessions to employees in order to attract specialists. In such areas, the presence of collective labor contracts and even partial, but their implementation. Therefore, for the implementation of social partnership, a high level of labor potential of both an individual employee and the aggregate labor force is necessary. At the same time, labor potential without an established system of social partnership is not capable of developing.

The oil industry of Kazakhstan is not only the most important industry, it is one of the main components of the economic security of the country, its independence. Tax revenues from the development of oil fields and the sale of oil allow for the implementation of social programs and strengthen domestic political stability.

Having emerged as a mechanism for resolving labor disputes, and having proved its effectiveness, social partnership is increasingly turning into an instrument of public participation in solving social problems. On this basis, further effective development of the system of social partnership will contribute to the balance of interests in society with the aim of relieving social tension and ensuring social and political stability of the society.

Oil companies-subsoil users are important and active agents of economic and social development, as they receive income from the development and use of oil fields in Kazakhstan. According to the contracts concluded with subsoil users, they are obliged not only to use goods and services produced by domestic producers in their activities, to attract Kazakhstani personnel to carry out the work, but also to train Kazakhstani specialists at the expense of the received income from subsoil use.

For example, JSC NC "KazMunayGas" conducts continuous monitoring on the issues of retraining and advanced training of engineering and managerial staff for the preparation and conduct of projects for the development of the Kazakhstan sector of the Caspian Sea. The funds allocated by him for the training of his own staff are directed to the development of new technologies in the oil and gas industry and internships in large oil and gas companies.

"The first positive social effect of the activities of subsoil user companies in Kazakhstan can be attributed to their contribution to the education and training of Kazakhstani employees of these companies (direct effect), thereby increasing the number of qualified Kazakhstanis in the total number of personnel of these companies (direct effect), which can compete with foreign specialists (indirect effect). KAZENERGY, the Kazakhstan Association of Oil and Gas and Energy Complex Organizations, has been extremely active and responsible in creating and implementing educational programs for the oil and gas sector of Kazakhstan. In which the coordinating Council on education and personnel issues was created. The Council determines the roles, the measure of responsibility and the participation of employers in organizing the process of professional training of competitive personnel, and developing proposals that contribute to improving the quality of specialist training. The republic has a number of higher education institutions providing quality staffing, as well as educational programs of the Association of Energy Sector Enterprises KAZENERGY.

Today, the industry is faced with an important problem - a lack of highly qualified specialists. The rapid development of engineering and technology requires extensive training and retraining of the entire personnel of companies. The level of knowledge with which a young specialist comes to work in the company leaves much to be desired, which shows an imbalance between the requirements of companies for the qualifications of graduates of educational institutions and the content of training programs. To improve the quality of qualifications and provide work for graduates, large oil and gas companies have cooperation agreements with relevant universities in the country.

Thus, it should be noted that social partnership is one of the criteria for the democratization of society. It is aimed at ensuring, on the basis of equal cooperation, the real participation of workers, employers and the state in the development and adoption of socio-economic and labor policies based on the optimal balance of the interests of the parties. To ensure this balance, of course, it is necessary to have a rule of law state in which all relations must be regulated by democratic laws. The system of social partnership will actually fulfill its functions if democratic principles are respected, that is, various social groups will be given the opportunity to defend their interests and rights within the framework of the law.

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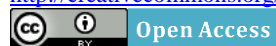
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APPLICATION OF HADI-CYCLE FOR PROVIDING SUSTAINABILITY OF PROCESSES OF KNOWLEDGE AND INNOVATION[*]

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Abstract. The main problems of modern business are related to the processes of creating knowledge and introducing innovations, which form the basis of the "innovation economy". To keep positions in the market, modern enterprises and organizations need continuous creation and production of new products. A constant search for new technologies, methods of personnel management and methods for implementing projects is necessary to ensure sustainable development of the enterprises and business. The article proves a hypothes explaining the process of creating and stimulating innovation within the framework of modern enterprises and organizations and its relationship with the processes of knowledge creation and HADI-cycle. The main scientific research methods are bibliographic analysis, content-analysis, formal logic methods and methods of analogies. The verification with the help of formal logic methods showed the universality of the proposed model for the innovative enterprtnership. The result of this article indicates that the mechanism of interaction between the standard and non-standard cycle of creating new organizational knowledge in the organization management system allows to accelerate the process of creating and introducing innovations, increases the effectiveness of marketing and management in general and sustainability development of the enterprises.

Keywords: sustainability development; innovative enterprtnership; innovations and technology transfer; stimulating innovation; HADI-cycle; processes of knowledge creation; knowledge conversion

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1. Introduction

The modern economy is undergoing significant changes. Competitive organizations should take the initiative, act in accordance with the future needs of society and trends in the market, anticipate changes in society, thereby creating advantages over competitors (Lumpkin & Dess, 2001). The reactions to the problems that arise in a changing society are new types of knowledge and new ways of organizing their production, which can arise as generators of knowledge (Fogerberg et al., 2012).

In conditions of a low level of knowledge, in the absence of new ideas, enterprises will not generate innovations. "Creativity, innovation and divergent thinking are routinely expected to help people envision and implement alternative practices to the status quo" (Sandri et al., 2013; p.765). The innovative activity of organizations depends entirely on knowledge management and creativity. It is creativity that gives the most important applied implications for managing innovation (Brem et al., 2016). Structuring and defining the transformation of organizational knowledge makes it possible to more accurately pick up management tools for the organization's innovative potential. Innovative organizations support new ideas and create new knowledge more actively, creating a mechanism for the continuous development of new products, services or processes (Lumpkin & Dess, 1996). Transformation of knowledge in the organization provides its value to its customers and helps to achieve a high competitive position in the market (Griffith et al., 2006).

However, there is considerable literature which attempts to define knowledge-based innovation and suggests that the process of innovation itself relies heavily on innovation knowledge that is usually created and transferred or disseminated within a company, between companies, or between companies and innovators (Nonaka & Kogut, 2009; Tehseen et al., 2019; Bublienė et al., 2019). R.M. Grant (Grant, 1996), D.F. Teece (Teece, 2000), Y. Li, X. Liu, L. Wang, M. Li and H. Guo (Li et al., 2009) observed correlation with innovation and creation of knowledge through its collection and use within the enterprise (Schulze & Hoegl, 2008). R. Puente-Diaz explored the consequences of creative self-efficacy in the work domain (Puente-Diaz, 2015) and X. González, D. Miles-Touya and C. Pazó studied the worker training and innovation on the firm level (González et al., 2016).

2. Theory and Hypotheses Development

Studying the practice of competitive struggle in the modern economy shows that innovation, the development of new products and services involves extensive and intensive activities in the field of knowledge. "Research & development has been identified as a key element to achieve competitive advantage, particularly in contexts of change and especially for technology-based companies" (Bigliardi & Galati, 2014; p.157). The transformation of knowledge provides value to its customers and helps to achieve a competitive position in the market (Griffith et al., 2006). The organization creates a new mix of resources and products designed for the upcoming changes, opportunities and market entry, taking advantage of opportunities (Lumpkin & Dess, 2001). Creativity and innovation are at the core of important outcomes such as economic and sales growth, the creation of new product (Puente-Diaz, 2015; Relich, 2015).

Innovative firms may have a tendency to support new ideas and novelty, and further increase the engagement in development of new products, services, or processes (Lumpkin & Dess, 2001). They must be proactive, anticipate and act on future demands and needs in the marketplace, thereby creating first-mover advantage vis-a-vis its competitors (Lumpkin & Dess, 2001). The development of new products and services involves extensive and intensive knowledge activities. New types of knowledge and new ways of organizing the production thereof may emerge as knowledge generators' response to the challenges posed by a changing society (Fogerberg et al., 2012).

R. F. Hurley, G. T. M. Hult and M. Tomas found a correlation between high levels of innovation and a culture of learning (Hurley et al., 1998). This affects the use of knowledge in the workplace (Li et al., 2009). O.J. Sandri, S., Holdsworth and I. Thomas proved the importance of measuring the creative abilities of university graduates as an important part of the cycle between workplace expectations, graduates' learning outcomes, teaching and learning, and curriculum development during degree programs (Sandri et al., 2018). Organizations with innovative tendencies are more likely to exchange and use information (Williams & Lee, 2009). In entrepreneurial firms that shared knowledge within the company, new knowledge and their distribution throughout the enterprise were created (Cohen & Levinthal, 1990; Mavrina & Mingaleva, 2017). "Previous researches of knowledge management chiefly focused on qualitative approaches, and largely stressed key success factors of knowledge management, such as the infrastructure of information technology, the design of the knowledge management system, deployment of motivation schemes, and the like" (Korposh et al., 2011; p.225).

Modern researchers test hypotheses and put forward concepts about the transformation of knowledge in organizations (Krenz et al., 2014; Chang et al., 2014; Felin & Hesterly, 2007; Jian & Wang, 2010). They study the role of international knowledge and the creation of new knowledge in multinational company subunits (Cantwell & Piscitello, 2015; Pan & Zhang, 2012). These studies have revealed the importance of cyclical phenomenon of knowledge management.

On the basis of theoretical approaches to the concept of knowledge transformation and introduction of innovations available in the modern scientific literature (the knowledge spiral of socialization, externalization, connection, and internalization is the core of discussions and researches), we have formulated a number of hypotheses describing the process of implementing and stimulating innovations through the concepts of the theory of knowledge.
Hypotheses

H1. *The creation of innovation involves several successive stages in the transformation of existing knowledge.*
The mechanism for creating innovation consists of the following stages: the creation of personal knowledge, the creation of codified knowledge, the creation of competence knowledge, the creation of materialized knowledge.

H2. *An innovative economy requires the creation of mechanisms that increase the accuracy of testing new ideas and accelerate the process of innovation. Such a mechanism is the HADI-cycle. HADI-cycle assumes the reverse order of passing the stages of transformation of existing knowledge.*
HADI-cycle is a mechanism for introducing innovations. The mechanism of knowledge transformation in the process of implementing innovation activity on the basis of HADI-cycle application consists of the following stages: creation of materialized knowledge, creation of competence knowledge, creation of codified knowledge, creation of personal knowledge.

H3. *HADI-cycle is the accelerator of idea verification, innovation in the enterprise.* *HADI – cycle helps to increase the effectiveness of the process of creating knowledge and innovation*

3. Method

The main research methods were:
  - content-analysis of scientific literature to identify information on the basic scientific approaches to the creation and transfer of knowledge in various areas of scientific, innovative and industrial activity;
  - system analysis - to generalize and systematize information about the processes of creating and transferring knowledge and its transformation into innovation;
  - structural analysis - to reflect the basic relationships between the elements and processes of creating and transferring knowledge and its transformation into innovation;

- methods of formal logic - for the theoretical justification of hypotheses and their verification.

Theoretical and methodological verification of the formulated hypotheses was carried out on the basis of the approaches to the management of knowledge and innovations developed in modern science, the theories of individual creative action and innovation management, the theory of organizations and the social cognitive theory. We used the classification of the forms of knowledge of I. Nonaka and H. Takeuchi (Nonaka & Takeuchi, 1995) the research of P.M. Leonardi and D.E.Bailey about the making implicit knowledge explicit in task-based offshoring (Leonardi & Bailey, 2008), the approach to the creation of new knowledge in organizations of H. Tsoukas (Tsoukas, 2009) and the PDSA cycle by W. Edwards Deming (Deming, 1986). Also we used the theoretical and practical results of our previous research (Mingaleva et al., 2016) and the quantitative method of the creation of new knowledge and upgrade current knowledge (Korposh et al., 2011).

4. Results and Discussion

H1. The creation of innovation involves several successive stages in the transformation of existing knowledge. *The mechanism for creating innovation consists of the following stages: the creation of personal knowledge, the creation of codified knowledge, competence knowledge, the creation of materialized knowledge.*

Generation and reproduction of innovations is one of the key foundations for the development of organizations in the knowledge economy (Spender, 1996; Minbaeva et al., 2014). Creation of new knowledge, intellectual product consists of 4 stages: 1) creation of personal knowledge; 2) the creation of codified knowledge; 3) creation of competence knowledge; 4) creation of materialized knowledge (Korposh et al., 2011). The main stages of creating knowledge in the process of intellectual activity in turn form a system of circulation of knowledge, including with the external environment, where new knowledge is disseminated and where people get new information for expanding their personal knowledge (Figure 1).
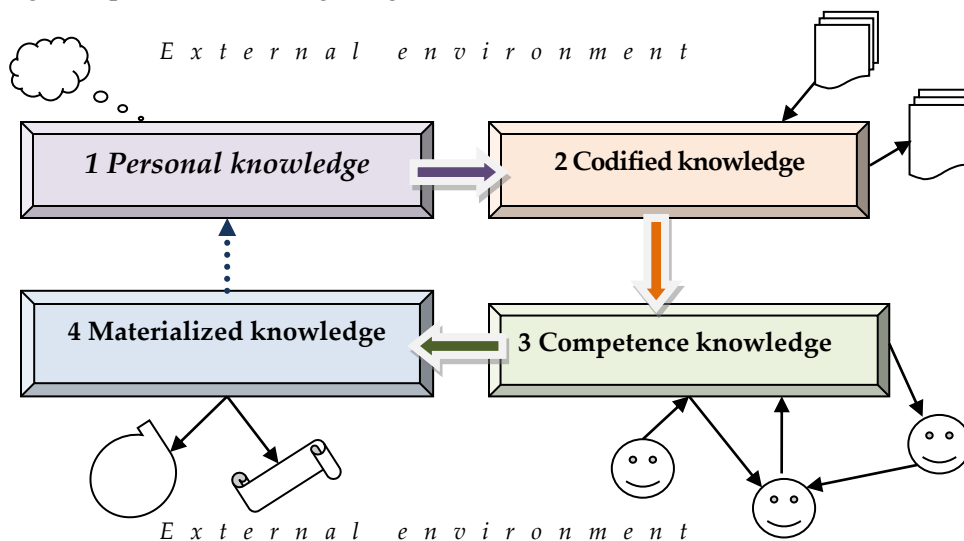
Fig. 1. The cycle of creating of new knowledge

Source: Autors (2019)

Personal knowledge is a person's knowledge, accumulated as a result of the formation of a creative personality, the creation of human capital. Codified knowledge is knowledge accumulated in the knowledge bases and databases of the enterprise, as a result of the coding and dissemination of personal knowledge. Competent knowledge is the knowledge of employees realized in the process of intellectual labor, accumulated as a result of

the development and maintenance of social capital. Materialized knowledge is materialized new knowledge in products and services. The materialization of knowledge is the transformation of knowledge into information that can be transferred to other people for further use (Corredoira & Preeta, 2015; Roper & Hewitt-Dundas, 2015).

Stages of knowledge transformation provide the circulation of new knowledge in the company. Through the process of transformation, knowledge from the category of personalities through coding is transformed into an intellectual product capable of marketing. The transformation of knowledge is due to the intellectual work of man. The process of transformation of existing knowledge in the creation of new knowledge begins with a comprehension of the problem and determination of ways, methods and tools for its solution (Otsuki & Okada, 2009). Awareness of the idea and the possibility of realization is already a new personal knowledge. Creation of a drawing, technical documentation of a new product, work schedule, etc. is a newly created codified knowledge. The implementation of new activities and the development of new skills of innovation are the competence knowledge of the enterprise or organization. The end result of intellectual and material labor is a new product. A new design solution, innovation is a newly created materialized knowledge.

In turn, these four groups of knowledge include specific types of knowledge, which also differ in the way they are obtained and how they are fixed. Figure 2 shows examples of the content of personal, codified, competence and materialized knowledge.

Personal knowledge:	*Codified knowledge:*
Personal opinion.	Declarative knowledge.
Common sense.	Statutory knowledge.
Collective knowledge.	Knowledge that depends on the specific
Traditions of unknown origin.	position.
Materialized knowledge:	*Competence knowledge:*
Objective / scientific knowledge.	Procedural knowledge.
Technical solution, documentation.	Random learning.
Intellectual product.	Automatic knowledge.
Patent.	Practical knowledge.
	Irrelevant behavior.

Fig. 2. Variety of knowledge in the organization

Source: Autors (2019)

Figure 2 illustrates the internal diversity of all types of knowledge, which together make up organizational knowledge. Organizational knowledge exists in any organization always.

H2. *An innovative economy requires the creation of mechanisms that increase the accuracy of testing new ideas and accelerate the process of innovation. Such a mechanism is the HADI-cycle. HADI-cycle assumes the reverse order of passing the stages of transformation of existing knowledge.*

In practice, to accelerate the process of approbation of a new idea, the enterprise uses the HADI-cycle (Mingaleva & Deputatova, 2017). Four letters mean four words - "Hypothesis" - "Action" - "Data" - "Insights". This means testing the hypothesis through an action, with the subsequent collection of analytical information and the formulation of the relevant conclusions.

The HADI cycle is a cyclically repeated process of testing ideas that affect the improvement of key project projects, startups, businesses. These key indicators can be a message, the number of customers per month, the

number of returning customers, the conversion of the landing, etc. Each project needs its set of key indicators. The hypothesis can be confirmed or not. Its takes about a week to test the hypothesis in IT companies and small businesses. In organizations and enterprises in other areas of activity, as well as at large enterprises, this period may be longer.

In order to test the feasibility and possibility of applying the HADI-cycle to innovation, we will disclose the content of its main components and the stages of its implementation.

PDSA cycle by W. Edwards Deming is taken as a basis of HADI-cycle (Deming, 1986; Moen & Norman, 2009). The Deming's PDSA Cycle («Plan-Do-Study-Act») cycle is a cyclically repeating decision making process used in quality management (Deming, 1950; Ishikawa, 1985).

Stages of the HADI cycle. At the first stage of the HADI cycle, we generate a hypothesis that will improve the key indicator of the project, business. It is important that this hypothesis meets the SMART principle, that is, it is specific, measurable, achievable, relevant and time-bound. The hypothesis should solve the existing problem of the project and give a concrete result, which allows to improve the economic performance of the organization. For example: we assume that if we introduce the technology of improving the engine to improve the quality of the car, it will increase the number of new customers by X per month.

By the second stage of the cycle, we mean a concrete action aimed at changing the characteristics of the project, which allows us to prove or disprove the hypothesis. For a certain period, it is necessary to implement this event. In the cases with our example, the specific action will be: the release of a car with a new engine, informing customers about new quality characteristics of the product, etc.
At the third stage of the HADI cycle, we begin collecting data on key indicators that will be affected by the change. In our example this is: the number of new customers.

At the last stage of the HADI cycle, analysis and summing up takes place. If the hypothesis is confirmed, we develop our actions and scale them to other similar projects.

The mechanism of knowledge transformation in the process of implementing innovation activity on the basis of HADI-cycle application consists of the following stages: creation of materialized knowledge, creation of competence knowledge, creation of codified knowledge, creation of personal knowledge.
The innovation process begins with practical implementation in the form of a new product, service, management method, mode of operation, etc. materialized knowledge, which must be implemented in the organization's activities (organize production). The application of HADI-cycle in the innovation activity of the enterprise (organization) allows to organize the mechanism of transformation of the whole complex of knowledge to support and accelerate the process of innovations introduction.
The order of knowledge transformation within the HADI-cycle is shown in Figure 3.
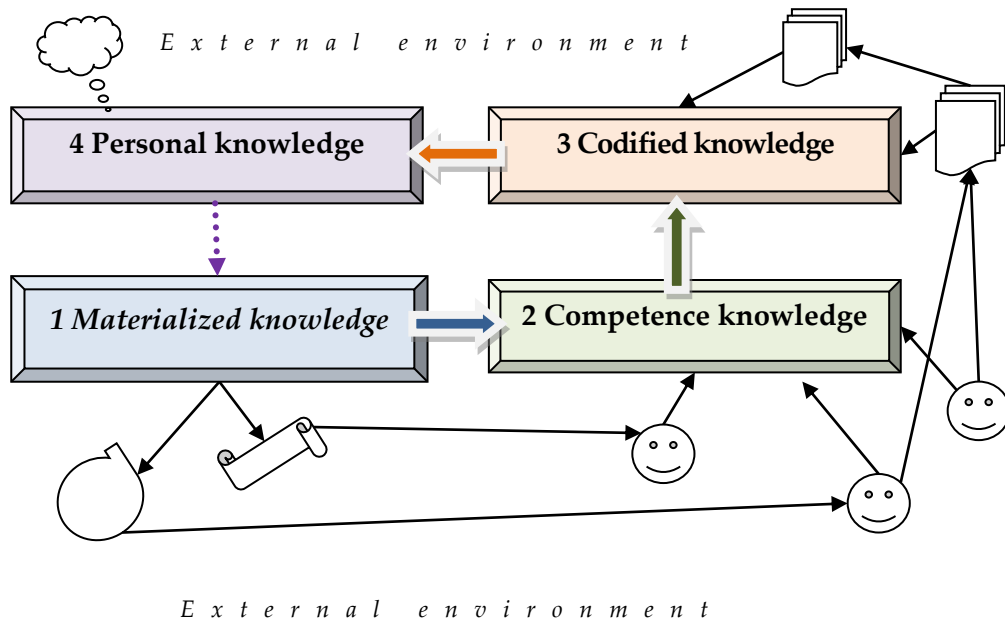
Fig. 3. HADI-cycle of knowledge transformation within the process of innovation implementation

Source: Autors (2019)

The cycle of introduction of innovation presented in Figure 4 has the reverse order of motion along the stages of transfer and transformation of knowledge in comparison with the standard cycle.

In the beginning, a new product is being created, the introduction of a new methodology, etc. - the practical implementation of materialized knowledge based on the prototype, the developed methodology, the patent, etc. (Dai & Chen, 2016). The verification of this new product by actions in the external environment (on the market) allows to create competence knowledge about the applied value of this new product (service, mode of operation, management method) for consumers and other counterparties (Vidic, 2013). The collection of data from the external environment forms the database and the knowledge base of the enterprise (organization), creating and supplementing the codified knowledge.

Perception of statistical and analytical information on the results of the introduction of a new idea of improving the company creates personal knowledge. Human cognitive abilities based on the accumulation of personal knowledge can allow to form materialized knowledge, a new idea, innovation.

Thus, the introduction of innovation is accompanied by the creation of a new materialized, competence, codified and personal knowledge, and the HADI-cycle is a non-standard cycle of creating knowledge, moving counter-clockwise.

H3. *HADI-cycle is the accelerator of idea verification, innovation in the enterprise. HADI – cycle helps to increase the effectiveness of the process of creating knowledge and innovation*

The system of management of innovations and intellectual labor, ensuring the continuity of the innovation process and aimed at creating a new intellectual product, materialized knowledge implies the transition from element to element according to the standard scheme. HADI-cycle, aimed at improving the key parameters of the organization's activities, involves moving from element to element in the opposite direction. The non-standard

cycle is an important driving force for the standard cycle of creating new knowledge and innovations. At the same time, the speed, uniformity and rhythmicity of the passage of the basic cycle for the creation of new knowledge essentially depend on the number, as well as the synchronism and consistency of the individual HADI-cycles ensuring the implementation of projects at the enterprise (in the organization). The mechanism of interaction of the standard cycle of creating innovations and several non-standard HADI-cycles is shown in Figure 4.

The study showed that for the successful operation of the cycle of creating a new intellectual product and a continuous innovation process, it is necessary to have several HADI-cycles that affect competitive key performance indicators of the organization (enterprise). Larger enterprise has more diverse and diversified its activities. And the more complex and diverse the innovation processes are, the more HADI-cycles are needed to continuously support and accelerate innovation.
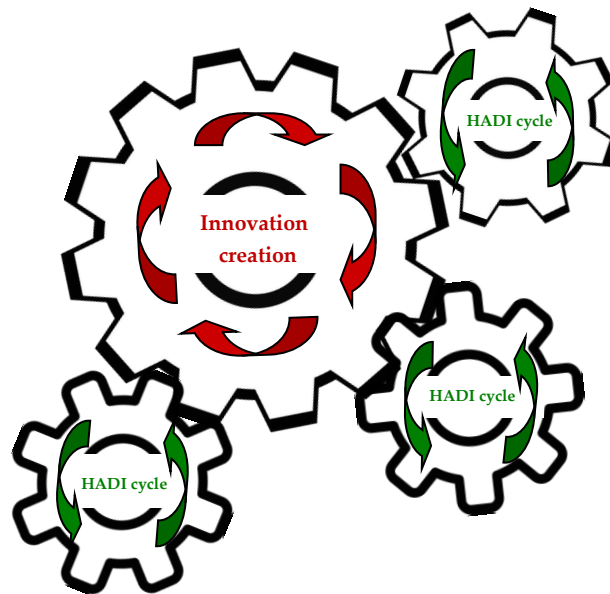
Fig. 4. The mechanism of interaction between the standard and non-standard cycle

Source: Mingaleva & Deputatova, 2017, p.82

The mechanism of interaction between the standard and non-standard cycle of creating new organizational knowledge in the organization management system allows to accelerate the process of creating and introducing innovations, improves the manageability of personnel, creates conditions for the development of its intellectual capital, improves the quality of products and services, and increases the effectiveness of marketing and management in general. This mechanism also explains and confirms the need to create project or working groups to address the current problems of the organization (Danilina et al., 2016; García-Cruz et al., 2018). The proposed mechanism positively influences the intellectual work management system, accelerates the process of creating an intellectual product and innovative activity.

Conclusions

The results of the research show the close interrelation and correlation between the main elements of the system of stimulating innovation in organizations and the competitiveness of organizations, manifested in the growth of their income. Theoretical and empirical analysis confirmed all hypotheses: the creation of innovation involves several successive stages of transformation of existing knowledge (H1); innovative economy requires the creation of mechanisms that help to improve the accuracy of testing new ideas and accelerate the process of innovation, which is the HADI-cycle. HADI-cycle assumes the reverse order of passing the stages of transformation of existing knowledge (H2); HADI-cycle is the accelerator of idea testing, innovation in the enterprise (H3).

The conclusions obtained as a result of the research make it possible to understand the dynamics of the process of creating and implementing innovations that ensure the growth of the competitiveness of organizations, the prospects for innovative development, the directions of action necessary to create new knowledge and their successful transfer within the organization to ensure reliable operation of the enterprise in a dynamic and competitive environment.

From a scientific and practical point of view, the study showed that managers of enterprises and organizations, research workers, innovators should be aware of the importance of the process of creating knowledge and its close connection with the innovation process. Managers of enterprises and organizations should contribute to creating a forming environment for creating an organization of a dynamic and effective process of creating knowledge.

The verification by using the methods of formal logic of the universality of the proposed model is confirmed by its applicability for building the system of knowledge management and innovations in enterprises and organizations of all types and spheres of activity.

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DEFINING SOCIALLY RESPONSIBLE COMPANIES ACCORDING TO RETAIL INVESTORS' PREFERENCES

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Abstract. The impressive growth of the funds managed following socially responsible investment strategies is a phenomenon that has been analysed from different perspectives. One of the main factors determining such investment strategies, maybe the most important one, is the selection of socially responsable companies, that is, the differentiation between socially responsible and irresponsible companies. Generally, the selection process is performed applying negative screening or positive screening strategies. Negative screening considers irresponsible companies those involved in the production of weapons or alcoholic beverages, following religious criteria. The positive screening approach is much more complex and less transparent. Both methodologies have been critizied as they do not prevent companies performing a clearly irresponsible behaviour to be included in the socially responsable portfolio. Moreover, it is important to stress that the opinion of retail investors is not considered when defining the concept of "socially responsible company", that is, the opinion of the potential clients of the socially responsible financial products. In this paper we are interested in the opinion of these potential clients regarding negative screening criteria, because we exclude the possibility of retail investors applying complex positive screening approaches. Our results show that compliance with the legislation is a main criterion for potential retail investors. This is an important outcome, as legal compliance is actually not a necessary requisite and non-complying companies are usually included in socially responsible financial products. Regarding negative screening based on the activity sector of the companies, results are more controversial.

Keywords: sustainability; mutual funds; socially responsible investment; screening methodology; retail investors

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JEL Classifications: G15, Q56

1. Introduction

In the last two decades, the so-called socially responsible investement has reported a considerable increase. This trend remains strong at the present time. According to the Global Sustainable Investment Alliance (2018), sustainable investing assets in the five major markets (Australia and New Zealand, Canada, Europe, Japan and the United States) stood at $30.7 trillion at the start of 2018, which means a 34 percent increase since the last report in 2016.

As a result of this development, a number of firms have emerged that rank companies according to their sustainability and social behaviour and elaborate socially responsible stock indices (Kutay & Tektüfekçi, 2016). In fact, there is not a single international organization or agency responsible for defining and measuring the sustainable performance of companies. By contrast, many private companies and institutions undertake this task, applying their own definitions and methodologies (Espinós-Vañó, García, & Oliver, 2018).

One of the most controversial aspects regarding the social and sustainable performance of companies is how to define this behaviour (A. K. Chatterji, Levine, & Toffel, 2009; de Felice, 2015; Hellsten & Mallin, 2006; Ou, 2016; Schwartz, 2003; Silvestre, Antunes, & Filho, 2018). That is, it is necessary to define which activities must be carried out by those companies that want to be defined as "socially responsible". And it is also critical to define which activities prevent a company to be qualified as such. This is a fundamental aspect, as the sample of companies selected has a decisive impact on any subsequent outcome. This problem has also led to terminological issues, and different academic papers define "sustainable", "ethical", and "socially responsible companies" sometimes as synonimes, sometimes as different concepts.

The multiple definitions used, together with the different approaches employed by the firms and agencies specialized in the identification and selection of socially responsible companies, often generate striking results. In fact, it is not rare that companies which would never be calified as "socially responsible" by a common citizen or a retail investor are definied as such by social rating agencies and belong to socially responsible portfolios, to sustainable company rankings or sustainable stock indices. That means that it is usual to find companies performing activities that can be clearly defined as irresponsible and unsustainable which are constituents of socially responsible investment funds. Some studies show that most of the companies included in the Spanish sustainable stock index should not be defined as "socially responsible" if simple and clear negative screening criteria would be applied (Espinós Vañó & García, 2018). This fact could easily explain the high correlation between sustainable stock indices and their conventional benchmarks (Arribas, Espinós-Vañó, García, & Morales-Bañuelos, 2019), as the constituents of both sustainable and conventional indices are mainly the same.

The described situation makes us wonder what is wrong with the selection process applied by social rating agencies. There must be something wrong as there are huge differences between the perception of the ordinary people regarding what is meant by "socially responsible company" and the outcome of the selection process by the specialised firms (Arribas, Espinós-Vañó, García, & Tamosiuniene, 2019). This concern has been raised by several researchers, who question the way the concepts of "socially responsible", "sustainable" and "ethical" company are used by most social rating agencies and other actors in the financial markets (Baccaro & Mele, 2011; A. Chatterji & Levine, 2006; Gangi & Varrone, 2018; Windolph, 2011).

The proper definition of "socially responsible company" is a critical issue, because all the socially responsible financial sector leans on it. If the definition is too flexible, the outcome might be that almost all companies may be considered socially responsible. In this line, a number of studies do not find significant differences between conventional investment funds' portfolios and sustainable portfolios (Benson, Brailsford, & Humphrey, 2006; Bertrand & Lapointe, 2014; Humphrey & Warren, 2016; Leite & Cortez, 2014; Renneboog, Ter Horst, & Zhang, 2011; Revelli & Viviani, 2015; Utz & Wimmer, 2014; von Wallis & Klein, 2015). Furthermore, the definition of

"socially responsible company" affects all studies which compare the performance of socially responsible firms to conventional ones (Achim, Borlea, & Mare, 2016; Balcilar, Demirer, & Gupta, 2017; Bergmann, 2016; Gherghina & Vintilă, 2016; Maciková, Smorada, Dorčák, Beug, & Markovič, 2018; Wei, Lu, & Kong, 2017).

In addition, it is important to understand how retail investors define the concept of "socially responsible company". This question is particularly important regarding the marketing of several financial products, like sustainable or ethical investment funds. If the definition and the screening methodology applied by the investment funds' managers is different from the one that would be applied by potencial clients, retail investors may be mislead by the adjectives "sustainable" or "ethical".

The aim of the present research is to examine the concept of "socially responsible company". The definitions applied by practitioners are compared with the perception of potential retail investors in order to verify whether they match or, conversely, they are not actually useful for retail investors concerned about companies' environmental and social performance.

The paper is structured as follows. First, we comment on the difficulty of defining the concept of "socially responsible company" and we describe the most common screening methodologies employed by socially responsible investment funds to select the companies in their portfolios. Next, we analise which are the most important criteria in the eyes of retail investors in order to define a company as "socially responsible". This analysis is undertaken on the basis of a survey conducted among students of the Faculty of Business Management and Administration in the Universitat Politécnica de Valencia, in Spain. The answers are then compared with the criteria actually applied by financial sustainability experts. Finally, the major findings of the research are reported.

2. The concept of socially responsible company

The first problem we face when assessing companies' behaviour is determining the scope of the analysis, that is, which dimensions of corporate behaviour must be included in the evaluation. Once the scope is defined, a rating is assigned to the companies and according to the rating obtained companies are defined or not as "ethical", "sustainable" or "socially responsible". It must be stressed that there is often confusion regarding these concepts, and there is a lack of consense as of their exact meaning. Normally, the difference is concerned with the scope of the analysis undertaken.

One of the ways of addressing the problem is starting with the concept of sustainability and sustainable development. The study which introduced these concepts was the so-called Brundtland Report, released by the World Commission on Environment and Development (World Commission for Environmental Development, 1987). This report defines sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The main problem of this definition is that it is very abstract and is not useful for operational purposes and it does not indicate which aspects of companies' activities must be noticed in order to manage firms' sustainability.

At present, some authors still identify the concept of "sustainability" exclusively in terms of company's environmental policy. Nevertheless, since Bansal (Bansal, 2005) most authors argue that firms' sustainability has a three-dimensional nature. Therefore, sustainable companies must be controlled for their economic, social and environmental performance. In turn, these three dimensions can be measured from different perspectives. Székely and Knirsch (2005) propose ten criteria that must be considered when analysing companies' sustainability. Among these criteria we find firm's ethical behaviour and sustainable job creation. In this way, the concepts of sustainability, social responsibility and ethical behaviour start merging (Montiel & Delgado-Ceballos, 2014). Currently, in the field of sustainable finance, usually following three dimensions are analysed: environmental, social and governance issues, the so-called ESG factors (Capelle-Blancard & Petit, 2017).

Some of the definions of "sustainable company" mention the importance of stakeholders, who are all those groups and individuals that are affected by the activity of a company (Freeman, 1984). A sustainable company should identify its stakeholders and consider their needs when defining and implementing its strategies (Hörisch, Freeman, & Schaltegger, 2014). This approach also implies analysing firm's activity from an economic, social and environmental angle. As a result, the range of the analysis becomes much wider, as firms have to consider the impact of their activities on external third parties. Therefore, companies defined as "sustainable" must perform ethically and be socially responsible. Including into the analysis stakeholders' preferences makes the importance of ethical performance even more evident. The first step towards ethical behaviour is legal compliance. Following some authors, not complying with the legislation should be understood as misconduct and bad ethics (Espinós-Vañó, 2016). For that reason, legal compliance should be employed as a preliminary screening criterion in the process of filtering for sustainable, socially responsible companies.

In practice, there are two main approaches to identify and select socially responsible companies: negative screening and positive screening (Arribas, Espinós-Vañó, García, & Tamosiuniene, 2019).

In the negative screening approach exclusion criteria are used. Companies which do not meet with the speficied standards and criteria are not elegible to be defined as "sustainable" or "socially responsible". Generally, criteria employed to perform negative screening are related with the activity sector of companies. In this line, it is common that ethical or sustainable mutual funds do not include in their portfolios companies which produce weapons, alcoholic beverages or tobacco. In the negative screening approach, the economic, social and environmental performance of companies is not analysed, just the economic activity of companies. Usually, religious criteria are employed to define which sectors must be defined as not complying with the ethical standards and therefore excluded from the investment portfolios. The reason is that religious American goups, like the Methodist Church and the Quakers were the pioneers in socially responsible investment (Guay et al., 2004). Following the Global Sustainable Investment Alliance (2018), negative screening is the largest sustainable investment strategy globally with 19,8 trillion assets under management.

One version of the negative screening approach is the so-called norms-based screening, which performs screening of investments against minimum standards of business practice based on international norms, such as those issued by the Organisation for Economic Co-operation and Development (OECD), the International Labour Organization (ILO), or the United Nations (UN). Sustainable investment funds applying this approach managed $4.7 trillion in assets in 2018 (Global Sustainable Investment Alliance, 2018). It must be underlined that this screening methodology simply assesses the adherence to specific guidelines or pacts issued by prestigious international organizations. This approach has been often critizied (Espinós Vañó & García, 2018) and it does not actually consider law compliance.

Positive screening, the systematic and explicit inclusion by investment managers of environmental, social and governance factors into the financial análisis and the investment decisión process, is the second-most prominent screening strategy, with $17.5 trillion assets under management (Global Sustainable Investment Alliance, 2018) Positive screening requires the assessment of multiple activities within the companies, which must be identified, measured and weighted in order to obtain a ranking. This ranking is used to select for the sustainable portfolio those companies which obtain the highest scores. This approach has attracted the attention of many academics because of its complexity, as a high number of variables must be measured and weighted in order to obtain a final, unique indicator, and different multicriteria approaches heve been proposed. (Escrig-Olmedo, Muñoz-Torres, Fernández-Izquierdo, & Rivera-Lirio, 2017; García-Melón, Pérez-Gladish, Gómez-Navarro, & Mendez-Rodriguez, 2016; Lamata, Liern, & Pérez-Gladish, 2018). Nevertheless, positive screening has been critizied because of the lack of standardization, lack of credibility of the information inputs, bias, tradeoffs, lack of transparency and complexity (Arribas, Espinós-Vañó, García, & Morales-Bañuelos, 2019; Windolph, 2011).

Furthermore, positive screening is not able to identify and exclude from the sample of companies in the sustainable portfolio those firms which clearly perform unsustainable, unethical activities. Even though the performance of negative activities may be included into the analyses, their negative impact is diluted among all other criteria and variables which are also analysed and weighted. This fact explains why it is possible to find companies which perform unsustainable activities and violate the legislation as constituents of portfolios which are supposed to be socially responsible, ethical and sustainable (Arribas, Espinós-Vañó, García, & Morales-Bañuelos, 2019).

The analyses of the screening methodologies applied to define and identify socially responsible companies reveal that the opinion of retail investors is never considered. Moreover, we could not find in the literature research any research relating the above described screening methodologies and retail investors' opinion. Most studies which are interested in retail investors focus on their characteristics and behaviour (Berry & Yeung, 2013; Diouf, Hebb, & Touré, 2016; Michelson, Wailes, Van Der Laan, & Frost, 2004; Pérez-Gladish, Benson, & Faff, 2012; Renneboog, Ter Horst, & Zhang, 2008; Renneboog et al., 2011; Wins & Zwergel, 2014), but they do not analyse how do socially responsible retail investors define the concept of "socially responsible company" or what should be, in their opinion, the goal of sustainable investors (Capelle-Blancard & Monjon, 2012). This is a very important gap that should be filled, because there should be a reasonable compliance between the product which is offered (the socially responsible investment fund) and want the client (the retail investor) expects.

The objective of our research os to understand how retail investors discern between socially responsible companies and those which are not. We will assume that retail investors do not have the knowledge, nor the information or the time required to apply the complex positive screening methodology. By contrast, the retail investors apply negative screening based on the information about the companies published in the media. Our study uses a questionnaire in order to examine whether the activity sector criteria amployed in the negative screening approach match the perception of retail investors. Furthermore, other simple and transparent screening criteria based on legislation compliance are examined.

2. Methodology

The information for this research was obtained through a questionnaire conducted on students at the Faculty for Business Management and Administration of the Universitat Politécnica de Valencia, Spain, for 4 successive years from 2015 until 2018. The questionnaire was administered to students at the thrird course of the grade of Business Management and Administration, who are future potencial clients (and managers) of socially responsible mutal funds. The questionnaire was answered in one computer room of the faculty during the normal lessons, with no time limit. The questionnaire was prepared using google forms.

The questionnaire is made up of 10 statements which were assessed using a Likert scale. It was compulsory to comment on all statements. The questionnaire consisted of two sections. The aim of the first section (questions 1 to 6), was to check students' opinion regarding the relationship between "legal compliance" and "socially responsible behaviour". The second section (questions 7 to 9) analyses the link between "activity sector" and "socially responsible behaviour"", in line with the traditional negative screening. Only three negative screening criteria were included, those which are supposed to be more controversial among the Spanish young population. Finally, there is one statement which measures to which extent students trust the opinions of social rating agencies. The ten statements are following:

1. A company which does not comply with national or international law regarding human rights cannot be defined as "socially responsible company".
2. A company which does not comply with national or international law regarding labour legislation cannot be defined as "socially responsible company".

3. A company which does not comply with national or international law regarding environmental legislation defined be calified as "socially responsible company".
4. A company which does not comply with national or international law regarding tax legislation cannot be defined as "socially responsible company".
5. A company which does not comply with national or international law regarding criminal legislation cannot be defined as "socially responsible company".
6. A company which does not comply with national or international law regarding consumer protection legislation cannot be defined as "socially responsible company".
7. A company which is defined as "socially responsible" cannot produce weapons.
8. A company which is defined as "socially responsible" cannot produce tobacco.
9. A company which is defined as "socially responsible" cannot produce alcoholic beverages.
10. A company which has a certification from a social rating agency to be "socially responsible", can be defined, in fact, as "socially responsible", without doubt.

The five-level Likert scale used to scale the responses is 1 "strongly disagree", 2 "disagree", "neither agree nor disagree", 4 "agree", 5 "strongly agree".
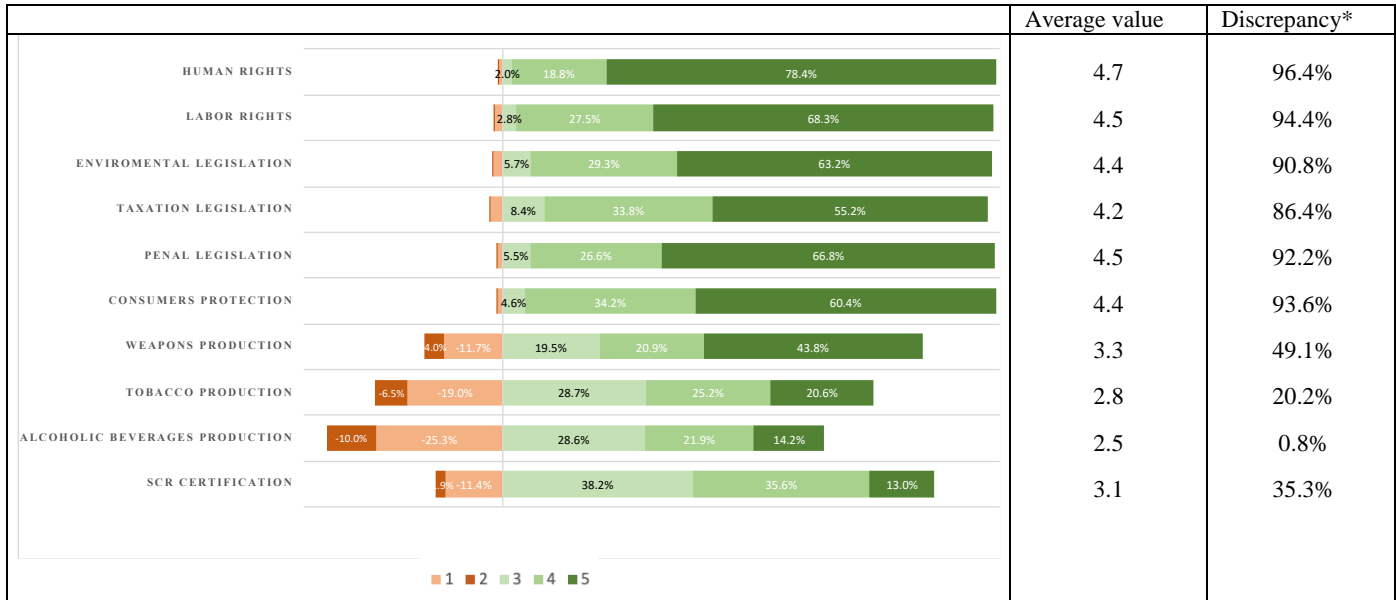
Sample size is 429, which is balanced between the four years of the study, includes 214 males y 215 females. By age, 221 respondents are younger than 21 years old and 208 are 21 years old or older.

3. Results

Figure 1 shows the summary of responses obtained for each item. Together with the graphical representation two values are shown: average value and discrepancy. The average value is the mean of the numerical values assigned to the answers obtain in each item. Values close to 5 stand for high level of agreement with the proposed statement, while values close to 1 show high disagreement. As sometimes the mean value may be not a good descriptive measure, the percentage of discrepancy was calculated as well. The discrepancy measures the difference between the percentage of confirmatory responses ("agree" and "strongly agree" in the Likert scale) and the percentage of non confirmatory responses ("disagree" and "strongly disagree" in the Likert scale). Doing this, it is easier to contrast contradictory opinions. High discrepancy values, near 100%, imply that most of the respondents do agree with the proposed statement. Values around 0% reveal that the statement is very controversial, having as many favourable opinions as opposing ones. Negative values close to -100% indicate that most of the respondents disagree with the proposed statement.

We start the analysis of the results discussing the responses obtained regarding the first section, which deals with the legal compliance criteria. Figure 1 shows that 89% or more of the respondents agree or strongly agree with the statement that those companies which do not comply with national and international legislation should not be defined as "socially responsible" (mean value higher than 4,2). This result is important, as it shows that for most of the potential investors in socially responsible mutual funds, legal compliance must be a requisite in order to incorporate a company into the portfolio. Therefore, such negative screening criteria should be implemented by social rating agencies and other sustainable investment experts.

Even though legal compliance is perceived as very important, there are some slight discrepancies regarding the importance of the different jurisdictions analised, that is, regarding the topic of the infringed legislation. Indeed, human rights violations are considered to be especially serious, followed by labor rights and criminal legislation infringements. They are followed by breaches of consumer protection legislation, environmental legislation and, finally, tax legislation (see Figure 1).

	Average value	Discrepancy*
HUMAN RIGHTS	4.7	96.4%
LABOR RIGHTS	4.5	94.4%
ENVIROMENTAL LEGISLATION	4.4	90.8%
TAXATION LEGISLATION	4.2	86.4%
PENAL LEGISLATION	4.5	92.2%
CONSUMERS PROTECTION	4.4	93.6%
WEAPONS PRODUCTION	3.3	49.1%
TOBACCO PRODUCTION	2.8	20.2%
ALCOHOLIC BEVERAGES PRODUCTION	2.5	0.8%
SCR CERTIFICATION	3.1	35.3%

* The discrepancy measures the difference between the confirmatory responses ("agree" and "strongly agree" in the Likert scale) and the percentage of non-confirmatory responses ("disagree" and "strongly disagree" in the Likert scale))

Fig.1. Response distribution for the ten statements in the questionnaire, average value for the Likerts scale and discrepancy.

Source: The authors

In the second section, which deals with the activity sector, there is less consensus among respondents, as shown by the mean values and the discrepancy percentage in Figure 1. Looking at the mean values, it is possible to state that most respondents do not support applying the activity sector as a filter in the negative screening approach. This is an interesting outcome, because screening based on the activity sector is the largest sustainable investment strategy globally, as commented in the introduction. Nevertheless, our result shows that this is not an appropriate filter for Spanish retail investors.

Among the three sectors analysed, weapon production generates the utmost rejection, obtaining a discrepancy value of 49.1%, followed by tobacco production (20.2%). Regarding the production of alcoholic beverages, there is great disparity of opinions. Thera are as many respondents for and against applying this criterion as a filter to define socially responsible companies. As a result, the discrepancy value is almost 0%.

These results show that the social and religious context are probably very important when defining what is a socially responsible company. For example, in the case of alcoholic beverages production, religion can be a key factor that influences whether retail investors consider that producing firms must be always considered irresponsible. In the Spanish case, consumption of alcoholic beverages is usual. Spain is a main wine producer and wine is linked with the Spanish culture. Therefore, it is easy to understand that most respondents consider that it is possible that a company producing alcoholic beverages can still be defined as "socially responsible".

Regarding the last questionnaire item, results show that most respondents are not influenced at all by the opinions disclosured by social rating agencies. The mean value is 3.1 and the discrepancy percentage is 35.3%.

Next, we describe the results focusing on the profile of respondents: gender (male/female) and age (19 and 20 years vs. more than 20 years). Figures 2 and 3 show the discrepancy values for each item regarding gender and age, respectively.

Analysing the results according to the gender shows the different perception of males and females regarding the definition of "socially responsible" companies. As of legal compliance, women are stricter, that is, they agree more often that non-complying companies should not be defined as "socially responsible". The biggest difference between genders appears for non-compliance with the tax legislation (10 porcent points). In this case, men are by far more permissive, i.e., a higher percentage of men than of women see no ethical conflict when a company does not pay the required taxes. A similar situation appears regarding environmental legislation (8.6 percent points)

Differences in terms of gender become more obvious when the activity sector is applied as screening criterion. Regarding weapons production and production of alcoholic beverages, women are more likely to consider those activities as being inherently socially irresponsible (14 p.p. and 8.3 p.p. above men, respectively). In the case of tobacco production, it is the men who are more likely to consider that tobacco producing companies should not be considered as "socially responsible" companies.

Finally, both groups have a similar perception of the opinions issued by social rating agencies.
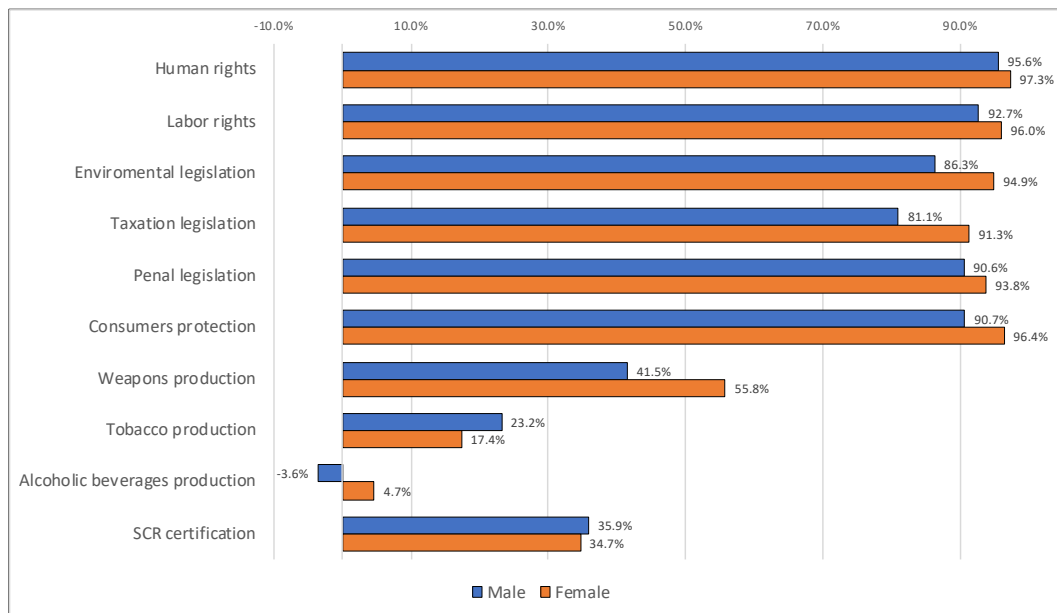
Fig.2. Discrepancy values for the 10 statments, gender.

Source: The authors

When the age of respondants is considered, there do not appear big differences between groups. Regarding law compliance, older students (21 years or more) are slightly less permissive regarding violations of labor rights and tax legislation. Younger students are more severe regarding environmental law compliance.

Regarding the activity sector, younger students agree more that companies in the weapons industry and in the alcoholic beverages industry should not be calified as "socially responsible", while older students are stricter regarding tobacco production.

Both groups have the same perception as for the opinions issued by social rating agencies.
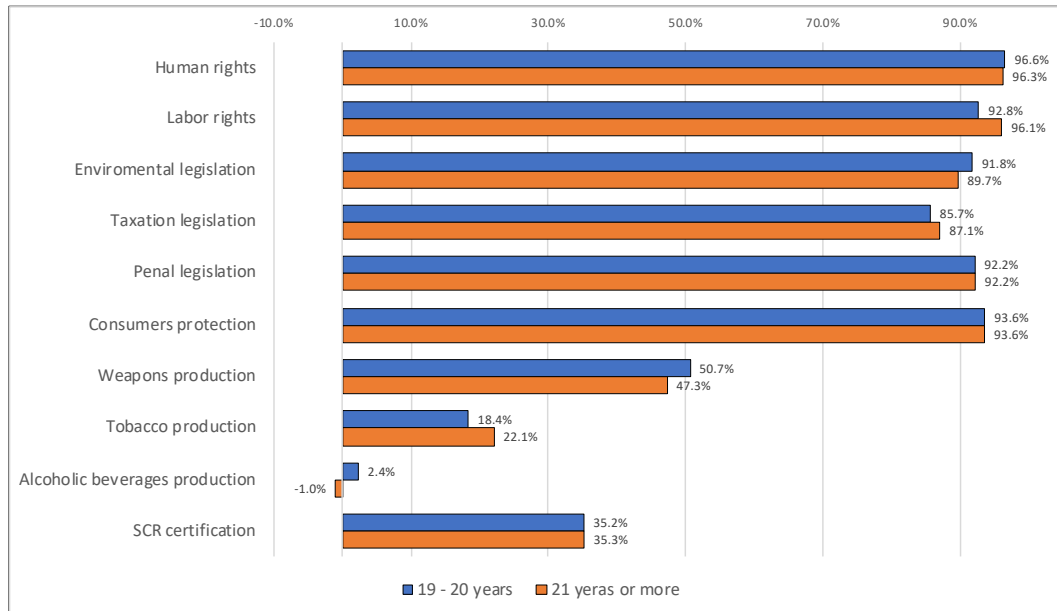
Fig.3. Discrepancy values for the 10 statments, age.

Source: The authors

The results obtained show that, in the case of potential clients of socially responsible mutual funds in Spain, legal compliance is a key requisite to determine whether a company can be defined or not as "socially responsible". This finding contrasts with the screening filters actually applied by the so-called socially responsible investment funds, which do not use this exclusionary criterion. Regarding the positive screening approach, legal compliance assessment is just one of many other criteria. Therefore, this approach is not suitable to identify and label firms which do not comply with legality as "socially irresponsible" companies.

Moreover, directly defining companies in especific activity sectors as "socially irresponsible" is controversial. Therefore, we can conclude that using the activity sector of companies as screening criterion, as is commonly the case, does not match the perception of most Spanish socially responsible retail investors.

Conclusions

In the field of sustainable finance, defining the concept of "socially responsible", "sustainable" and "ethical" company is a key issue. Investment in socially responsible companies, management of sustainable portfolios, sustainable company rankings, ethical stock indices, performance comparison of sustainable firms and portfolios with their conventional peers etc. mainly relies on the definition of "socially responsible company".

At the present time, there is no a single definition of "socially responsible company". Many international organizations and private social rating agencies use their own definitions and methodologies, which are more or less complex.

Generally, socially responsible companies are identified applying negative screening or positive screening. The negative screening approach disregards those companies which are involved in specific activities which are considered to be harmful. It is a simple and transparent approach. Positive screening is much more complex, as it

is necessary to define, to assess and to weight a high number of variables. Moreover, this approach is not transparent and it does not ensure that companies with irresponsible behaviour are automatically disregarded.

It is remarkable that the different definitions of "socially responsible company" have not been subject to a more thorough study by academics. Furthermore, with the only exception of negative screening based on religious beliefs, the different screening methodologies do not consider the opinion of retail investors, who are the potential clients of socially responsible mutual funds. Definitions and methodologies are issued which completely ignore the opinion of the end customer. Given this situation, it is possible that no match exists between the screening approaches actually performed by professional investors and retail investors' perception. In fact, it is not uncommon that companies which are described as "socially responsible" by social rating agencies and other financial experts are frequently involved in scandals due to their socially irresponsible actions.

This paper has used the negative screening approach in order to define what is not a "socially responsible company". This approach has been chosen because it is simple and transparent. A questionnaire was conducted on more than 400 students of the grade of Business Management and Admisnitration in Spain in order to identify possible criteria to diffenciate between responsible and irresponsible companies. Law compliance and activity sector were the two proposed negative screening criteria. Results show that law compliance is a fundamental requisite for most respondents. That means that companies which violate the law should not be defined as "socially responsible" companies. This result is in contrast to reality, as this criterion is not applied as necessary and excluding. Another important outcome of the research is that using the activity sector as negative screening criterion is very controversial. Analysis regarding gender and age only show relevant differences in the case of gender.

Obviously, the results of the study must be assessed within its limitations. The main shortcoming is the sample used, which is not representative for the Spanish population. In addition, sociocultural factors may have great influence on the perception of what is a proper behaviour or a wrong one, so the sample should be expanded to cover more countries and cultures. Finally, the questionnaire is not exhaustive regarding legal topics nor activity sectors used in the traditional negative screening approach.

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DEVELOPMENT OF TOOLS FOR REALIZING THE POTENTIAL OF FINANCIAL STABILITY OF ENTERPRISES

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Abstract. The article discusses the issues of financial stability of enterprises in unstable economic conditions. The authors propose a formal model of the gradual quantitative assessment of the financial stability of enterprises based on the use of regression equations with determination coefficients. The financial stability of enterprises is described by the indicators of their financial status according to the regional-average and industry-average levels. A qualitative assessment of the financial stability potential of enterprises is given based on the interpretation of deviations of the financial stability coefficients. The article defines the limiting values of financial stability of enterprises, the output of which allows the unambiguous interpretation of this concept and its level. An example that determines the financial stability of various Russian enterprises is also presented.

1. Introduction

Considering the variability of factors relating to the external and internal economic environments, it is advisable to both ensure and strengthen the financial stability of enterprises. A model to assess the financial stability potential of enterprises could be used as one of the elements of the financial mechanisms that ensure their

sustainable development. The results of the financial stability analysis of enterprises contribute to effective decision making in their dynamic development. The financial stability potential of enterprises refers to their financial condition, the terms of which provide for balanced functioning and a sustainable development strategy. The presence of financial stability potentials provides a company the possibility of their inclusion in the cluster and the implementation of public-private partnerships. Financial stability in the conditions of economic system is the specific implementation factor, which is holding the diversity of several elements. When discussing financial stability, there are the special prospects, which influence the capability of enterprises. Financial mechanisms, which positively influence the economic sphere of each enterprise, include a stable base of financial factors. For example, there are financial instruments and technologies; they have the specific base on influencing on the potential of enterprises. Economic results are talking about not only the positive or negative factors; they are contributing the whole number of reasons. These reasons influence on the using of such economic analysis tools in which it is possible to construct a collinear relationship between two or several quantities, make an economic analysis using statistical data, etc.

2. Literature review

For example, Pasquariello (2007) found through an empirical investigation of the impact of Central Bank interventions on the process of price formation in foreign exchange markets. Dong et al. (2019) wrote that the development of a country's financial sector plays an important role in shaping its industrial structure. Based on longitudinal data on manufacturing firms, they found that banking reform reduced concentrations in the product market by encouraging the growth of smaller and younger firms. Siegel et al. (1982) wrote that the systematic development of a model of nominal income, based upon the Cambridge equation and the loanable funds theory of interest, they were interested in financial system. Silva et al. (2017) said that the crucial role of the industrial sector is evident in policy makers' focus on the reform and privatization of industry and in seeking foreign investors and technologies to allow for further financing of enterprises. Nam, & Uchida (2019) published their results after controlling for other country- and firm-level characteristics with alternative definitions of the global financial crisis and accounts payable. In Aljifri, & Moustafa (2007) research the main aim of the study is to investigate empirically the effect of some internal and external corporate governance mechanisms on the firm performance.

Extensive and already well-known literature has shown the crucial importance of financial systems to economic growth. What started with simple inter-regional regressions, as used by Schwert (1993), turned into a large body of literature that uses many different methods to go beyond correlation and to control deviations that occur as a result of endogeneity and omitted variables. In particular, using instrumental variable approaches, the various approaches that consider the variably effects of finance on specific sectors and thus point to "smoking gun", studies of specific regulatory changes that have led to a deepening of the financial situation in given countries, micro-level approaches, and the use of company-level data has yielded essentially the same results: a deepening of the financial process is an important part of the overall development of any given country. There are several non-exclusive explanations for this nonlinearity that have been proposed in the recent literature and which are based in part on the recent crisis. Lucas's critique can be applied to standard measures of financial development in the sense that turning this indicator into a policy variable distorts, and ultimately removes the link between finance and growth. The indicators of financial depth and intermediation used in the literature may simply be too crude to capture quality improvements at high levels of financial development. In addition, the financial sector has gradually expanded the scope of its activities beyond the traditional mediation activities in the direction of so-called financial activities "without mediation" (Renneboog, 2008). As a result, conventional mediation measures are becoming less and less compatible with the reality of modern financial systems. Some argue that the reason for the nonlinearity of the relationship between finance and growth may be that financial development helps catch up with the productivity frontier but has limited or no effect on growth in countries that are close to, or at, the

border (Santomero et al., 2005). Thus, we do not expect any growth effects from further financial deepening in high-income countries. Another reason for these nonlinearities may lie in the beneficiary of the loan, according to (Kankia, 2013), which explores the impact of differentiated growth in lending to businesses and households. According to the theory, they believe that economic growth is enhanced by enterprises, not by household loans. Most of the financial deepening in high-income countries comes from additional household lending, which may thus explain the relationship between finance and growth in high-income countries. The financial system may actually grow too large compared to the real economy if where $Y(x)$ is financial stability potential of the business entities in question; it extracts excessively high information rents and thus attracts too many young professionals to the financial industry.

3. Methodology

A multiple linear regression equation can be used as a tool to assess the financial stability potential of enterprises. The multi-factor model of such an equation has the following form:

$$Y(x) = a_0 + a_1 \bullet x_1 + a_2 \bullet x_2 + ... + a_m \bullet x_m \qquad (1)$$

$x_1, x_2....x_m$ are the indicators of financial stability of economic entities;

$a_0, a_1, a_2...a_m$ are the coefficients of the regression equation ($j = 1,2,....m$);

m is the number of indicators.

The indicators typical to the modern financial condition of the Russian enterprises considered herein were selected as appropriate indicators of the financial stability of enterprises in general. These are the regional-average and industry-average indicators and the current actual values of the associated financial coefficients (Borodin, 2015). Analysis of the factors that describe the financial condition of enterprises showed that the most significant impact on financial stability is made by the following indicators: the coefficient of capital structure, the coefficient of autonomy, the coefficient of current liquidity, the coefficient of security of own circulating assets, and return on equity. A monetary flow and its direction have a significant impact on the financial position of any given company.

For example (Hasan et al, 2107) found that firms headquartered in U.S. countries with higher levels of social capital incur lower bank loan spreads, where in this case the financial stability of each enterprise depends on the bank's support.

(Renneboog, 2008) noted that the past decade has witnessed a spectacular surge in corporate restructuring worldwide, as driven by technological shocks, market deregulation, and the increasingly intense global competition for capital supply. They researched financial factors and their influences.

(Bandiera et al., 2000) said that the effect of financial liberalization on private saving is theoretically ambiguous, not only because the link between interest rate levels and saving is itself ambiguous, but also because financial liberalization is a multidimensional and phased process, sometimes involving reversals, so it will influence on the whole activity.

(O'Connor, & Lucey, 2015) said that primary goal is to provide an outlet for high quality Financial Research. They mentioned that it would be the big openness to every country how it will work inside the firms.

The indicators of the financial stability of enterprises are shown in Table 1.

Table 1.Indicators of financial stability of enterprises

Name of indicator	Economic characteristics
1. The coefficient of capital structure (x_1)	Indicates the relationship between borrowed funds and a company's own resources. The value recommended is 1.0
2. The coefficient of autonomy (x_2)	Defines the ratio of own funds to the total amount of funding. The value recommended is 0.5
3. The current ratio (x_3)	Shows adequacy of current assets to repay current liabilities. The value recommended is 2.0
4. The ratio of own working capital (x_4)	Indicates the security holdings of a company's own working capital. The value recommended is 0.1
5. Return on equity (x_5)	Defines the ratio of net profit to private sources of capital funding.

It is advisable to perform the phased construction of the model used to assess financial stability potential (1) in two stages.

The first step is to provide the independent variables in the model (1). It is advisable to identify correlations between the indicators that influence the financial stability of the enterprise and the potential for their financial stability on the one hand, and the correlative dependence between the indicators of financial stability of enterprises on the other. We consider the financial stability potential of enterprises to be the result criterion y_i and indicators that affect the financial stability of enterprises as per the factor criteria x_i.

To calculate the degree of correlation between the above, we can use the formula:

$$\kappa = \frac{\sum_{1}^{n}(x_i - \bar{x})(y_i - \bar{y})}{n \bullet \delta_x \delta_y}, \qquad (2)$$

where κ is the correlation coefficient;

x_i, y_i are the values of the x, y indicators for the $i-th$ measurement;

$\bar{x}, \bar{y}$ - are the average statistical values of the x, y indicators;

δ_i, δ_y are the standard deviations of the x, y values;

n is the number of measurements in the sample.

The correlation coefficient ranges from -1 to + 1. The closer the value of the correlation coefficient is to unity as an absolute value, the stronger the relationship between the financial stability potential of the enterprises and the factors affecting their financial sustainability. To calculate this correlation, we must specify values for the x_i, y_i indicators. The industry-average indicators (for a particular industry) are taken as the x_i indicators, where the y_i indicator was determined on the basis of the results of particular studies that used the expert evaluation method, which consists of collecting the opinions and suggestions of experts on the issue of interest with subsequent scientific processing of the results so obtained.

A written survey was used in the study of research, which included: the purpose of the examination (determination of the magnitude of financial stability potentials); substantiation of the object of the research; definition of the research stages; the selection of experts; verification of experts' competence; harmonization of

the evaluation studies received; and the evaluation of the examination's results. To obtain our results we used a questionnaire survey, where business and professional qualities of such experts were determined by answering specially designed questions. The questionnaire designed included questions, the possible alternative answers and their weights. Questionnaires were distributed among the employees of various enterprises in the real sector of the economy and university employees working on this issue. The coefficient of competence was determined in order to examine the competence of these experts.

The magnitude of the financial stability potential lies in the range from 0.0 to 1.0. The factors influencing subject preference of one factor over another were revealed in the process of determining the magnitude of financial stability potential. In this case, a method of ranking objects with processing results on the calculation of generalized values ranking and the application of the method of ranks sums was used. The objects were then ordered along the chain of inequalities $r_1 \leq r_2 ... r_m$. Quantitative assessment of the extent to which experts were in agreement can be defined on the basis of calculation of the concordance dispersion coefficient.

The ranking of each factor was determined by means of expert evaluation where, according to experts, the financial stability potential of enterprises is mostly influenced by factors associated with capital structure (the resultant grade 1); factors related to the amount of equity (rank 2); and factors determining the efficiency (rank 3). The factors that appeared to be less important from the experts' points of view took the following order: factors related to the security holdings of the company's own working capital (grade 4); and factors related to solvency and liquidity (grade 5). The coefficient of experts' concordance was found to be 0.9, which means that more than 90% of the ranking factors are the same. For the purposes of this study, this coincidence was considered to be sufficient to ensure the validity of our subsequent analysis.

The magnitude of an enterprise's financial stability potential can be determined in descending order of influencing factors, starting with the most important ones with the resulting grades of 1, 2, and 3. The magnitude of the financial stability potential was calculated for each level of financial stability (super-steady, high, quite high, medium and low). At each subsequent level, the magnitude of the financial stability potential is lower than for the previous one, since resistance may decrease due to negative changes under the influence of external and internal threats.

4. Results' analysis

Factors directly associated with indicators of capital structure, equity ratio and other parameters are shown in Table 2, with the associated levels of financial stability also given.

Table 2.Differentiation of financial stability potential of enterprises by level

Level of financial stability potential	Super-stable	High	Quite high	Medium	Low
Indicator deviation, %	0-9	10-19	20-39	40-69	70 and more

Standard deviation and variance are the absolute indicators, the values of which depend on the absolute values of the original symptom. It is therefore necessary to consider the coefficient of variation. Variance, standard deviation and variation in the levels of financial sustainability potential are listed in Table 3.

Table 3. Variance, standard deviation and variation of financial stability potential

Name of indicator	Level of financial stability potential of enterprises				
	Super-stable	High	Quite high	Medium	Low
S	1.0	0	0	0.05	0.03
σ	1.0	0	0	0.22	0.17
B	0.86	0	0	0.073	0.034

The dependence of financial stability potential on the values of the factors affecting financial sustainability are given in Table 4.

Table 4. The dependence of financial stability potential of enterprises on factors that can affect financial stability

Levels of financial stability potential	Values of the indicators and financial stability potential of enterprises					
	(x_1)	(x_2)	(x_3)	(x_4)	(x_5)	$Y(x)$
Super-steady	0.206	0.260	0.112	0.012	0.330	0.890
Quite steady	0.166	0.199	0.084	0.014	0.396	0.880
High	0.226	0.290	0.140	0.010	0.260	0.630
Medium	0.226	0.290	0.126	0.011	0.160	0.540
Low	0.216	0.280	0.136	0.010	0.210	0.480

The correlation between the indicators influencing financial stability and financial stability potential are presented in Table 5.

Table 5. Correlation between the indicators influencing the financial stability and financial stability potential of enterprises

Indicators	(x_1)	(x_2)	(x_3)	(x_4)	(x_5)
Correlation coefficient	0.790	0.824	0.835	0.636	-0.72

The correlation between the indicators influencing the financial stability of enterprises between is presented in Table 6.

Table 6. Correlation between the indicators of financial stability

Indicators	(x_1)			
	(x_2)	(x_3)	(x_4)	(x_5)
Correlation	0.567	0.670	0.659	-0.929
	(x_2)			
Correlation	(x_3)		(x_4)	(x_5)
	0.647		0.681	-0.538
	(x_3)			
Correlation	(x_4)		(x_5)	
	0.516		- 0.678	
	(x_4)			
Correlation	(x_5)			
	-0.637			

In order to determine the independent variables, it is essential to check them for multicollinearity using the system of inequalities:

$$\begin{cases} Rx_i y_i \geq Rx_i x_{i+1} \\ Rx_{i+1} y \geq Rx_i x_{i+1} \end{cases} \quad (3)$$

Using this system of inequalities, a comparison of correlation coefficients of enterprises' financial stability indicators was carried out. The evaluation of inequalities is based on the method of exclusion of indicators, but

which requires the correlation coefficients to satisfy the system of inequalities or at least one of the following conditions (Table 7).

Table 7. The performance of the conditions of the inequalities system, taking into account the correlation

Taking into account the correlation coefficients with the financial stability potential		
(x_1)	0.790 > 0.567 0.824 > 0.567	The condition is satisfied, we retain (x_1)
(x_2)	0.824 > 0.670 0.835 > 0.670	The condition is satisfied, we retain (x_2)
(x_3)	0.835 > 0.659 0.636 < 0.659	The condition is not satisfied, we reject (x_3)
(x_4)	0.636 > -0.929 -0.72 > -0.929	The condition is satisfied, we retain (x_4)
Taking into account the correlation of the coefficients of the indicators with each other		
(x_1) (x_2)	0.790 > 0.670 0.824 > 0.670	The condition is satisfied, we retain (x_1)
(x_1) (x_4)	0.790 > 0.659 0.636 < 0.659	The condition is not satisfied, we reject (x_4)
(x_1) (x_5)	0.790 > -0.929 -0.72 > -0.929	The condition is satisfied, we retain (x_5)
(x_2) (x_5)	0.824 > -0.538 -0.72 > -0.929	The condition is satisfied, we retain (x_2)

The test showed that the independent variables are: (x_1) - the coefficient of capital structure; (x_2) – the coefficient of autonomy; (x_5) – return on equity. Two specific criteria were used to select the independent variables: linear collinearity and the magnitude of closeness between the correlation connection and financial stability potential of enterprises.

In order to assess the quality of the correlation between the financial stability potentials and financial stability indicators, the Chaddock ratio is used as an empirical correlation indicator.
The highest correlation coefficients (0.8 or more) were found between the financial stability potential and the following indicators that influence financial stability: (x_1) - the coefficient of capital structure (correlation coefficient of 0.79); (x_2) - the coefficient of autonomy (correlation coefficient of 0.83); (x_5) - return on equity (correlation coefficient of 0.82). In accordance with Chaddock's recommendations, this value of the connection is close. Given the fact that we considered the factors affecting financial stability as independent variables, the estimation of financial stability potential of enterprises, would be as follows:

$$Y(x) = a_0 + a_1 x_1 + a_2 x_2 + a_5 x_5 \qquad (4)$$

where (x_1) is the coefficient of capital structure;

(x_2) is the coefficient of autonomy;

(x_5) is the return on equity.

Analysis of the results so obtained showed that the greatest impact of the capital structure, autonomy and return on equity on the financial stability of the enterprises coincides with the research of sustainability assessment, the reliability and stability of such entities on the basis of deviations of parameters from average values for organizations of the same size. A check of the statistics of financial stability allowed the identification of the most informative indicators using the well-known methods of complex evaluation of financial stability and competitiveness, as created by (Borodin, 2015).

The study of information content in the financial stability indicators allowed us to determine the most informative of such, which include the coefficient of autonomy.

The second step was to determine the coefficients of regression equation (4) by solving the system of normal equations via economic-mathematical methods and the choice of the approximating function. The system of normal equations has the following form:

$$\begin{cases} na_0 + a_1 \sum x_1 + a_2 \sum x_2 + a_3 \sum x_3 = \sum y \\ a_1 \sum x_1 + a_1 \sum x_1 x_1 + a_1 a_2 \sum x_1 x_2 + a_1 a_3 \sum x_1 x_3 = \sum x_1 y \\ a_2 \sum x_2 + a_2 a_1 \sum x_2 x_1 + a_2 a_3 \sum x_2 x_3 + a_2 \sum x_2 x_2 = \sum x_2 y \\ a_3 \sum x_3 + a_3 a_1 \sum x_3 x_1 + a_2 a_3 \sum x_2 x_3 + a_3 \sum x_3 x_3 = \sum x_3 y \end{cases} \quad (5)$$

The calculation of a system of normal equations (5) and the definition of the parameters of equation (4) are presented in the Table 8. As a result of solving the system of normal equations, the following equation parameters were derived (5): $a_0 = 0.00187$; $a_1 = -6.21$; $a_2 = 5.153$; $a_3 = 2.271$. The approximation is accurate to a maximum of 10%, and a minimum of 1.5%. A further calculation of the coefficients of the regression equation was carried out within the linear three-factor model. With the coefficients given, regression equation (4) then takes the following form:

$$Y(x) = 0{,}00187 - 6{,}21x_1 + 5{,}153x_2 + 2{,}271x_3 \qquad (6)$$

The validation of the regression equation values in (6) in terms of their adequacy to empirical values is made on the basis of the Fisher criterion (F-criterion). The critical value of the F-criterion was determined for the two degrees of freedom: $\kappa_1 = m - 1$ (3 - 1); $k_2 = n - 3 - 1$ (32 – 1 - 3). The adequacy of the resulting equation (6) was confirmed by F-criterion at a 1% significance level.

Practical calculations that allow for the determination of the financial stability potential can be performed in the following way. First, the values of the financial sustainability parameters are determined: the coefficient of capital structure, the coefficient of autonomy, and return on equity. Then the financial stability potential is calculated according to formula (6). The dependence of the financial stability potential changes on the volatility of the values of selected indicators is considered in two directions:

The first direction (in the instance of the simultaneous deviation of all indicators from the values recommended of the same magnitude to the downside). In such a situation, a clear relationship between the magnitudes of the indicators' deviations and the financial sustainability potential is determined: the bigger the indicators' deviations, the lower the potentials of financial stability.

Qualitative assessment of financial stability potential depends on the magnitudes of changes in factors affecting financial stability, as presented in Table 8.

Table 8. Qualitative assessment of the financial stability potentials of enterprises

Name of indicator	Financial stability potential of enterprises				
	Super-stable	High	Quite high	Medium	Low
Value of potential	6.176 - 5.44	5.43 - 4.88	4.87 - 3.76	3.75 - 1,0	0.99 and lower
Indicators deviation, %	0 - 10	11 - 20	21 - 40	41 - 60	61 and higher

Taking into account the qualitative assessment of the enterprises financial stability potential and the increases in variance of the factors affecting their financial stability from the recommended values in the downside, the financial stability potential of enterprises is steadily declining.

Let us assess definite the limiting (extreme) values of the financial stability potential. If the deviation of indicators influencing financial stability is as high as 10%, the financial stability potential can take values from 6.176 to 5.44 units. Such values were theoretically calculated based on the condition that the coefficient of capital structure was equal to 0.01 (equity 99%, borrowed capital 1%); the coefficient of autonomy in this case is equal to 0.99; the maximum return on equity is up to 50%. This is a theoretical option in excess of steady-state economic entities. The value of the indicators in the worst-case situation from a financial stability point of view will be as follows: the coefficient of capital structure is equal to 0.99 (borrowed capital 99%, equity 1%); the coefficient of autonomy is equal to 0.01; return on equity is up to 1% (almost none). In this case, the financial stability potential will be minimal, up to one and below.

The second direction. The values of the various indicators affecting financial stability simultaneously deviate from the recommended values in the direction of deterioration, but with different magnitudes. Some indicators have smaller deviations, whilst others are larger. The value of the financial stability potential in this situation will depend on which specific indicators have deviated and the magnitudes of their deviations. First and foremost, it is advisable to monitor the most informative indicator from the point of view of financial stability, i.e., the coefficient of autonomy and the size of this deviation. Due to the different values of indicators influencing financial stability, the potential for financial stability of economic entities can vary from 5.43 to 1.0, or potentially lower or even negative values, which would correspond to high, quite high, medium or low values. Negative values indicate that the economic entity is functioning on the basis of borrowed capital. When the deviation of certain indicators is in the range of 50-80%, the financial stability potential of the economic entity can be low; when other indicators range from 40 to 60%, the financial stability potential will be correspondingly moderate.

5. Case studies: "Identification of the financial stability potentials of enterprises"

It is necessary to determine the financial stability potential of enterprises based on the results of the model calculations (6) according to different industries; the associated calculations are presented in Table 9.

Table 9. Calculation of financial stability potential of various enterprises

The name of enterprise	The coefficient of capital structure	The coefficient of autonomy	Return on equity	Financial stability potential
1. SE "Orion"	0.66	0.34	0.12	-2.07
2. SE "Barkas" ("Longboat")	0.15	0.85	0.34	4.23
3. SE "Romashka" ("Daisy")	0.43	0.57	0.18	0.68
4. SE "Ussuri"	0.25	0.75	0.20	2.77
5. "Zelenstroy"	0.12	0.88	0.29	4.45
6. "Grand"	0.55	0.45	0.05	-0.98
7. SE "OVK"	0.07	0.93	0.43	5.36
8. "Blagoustroystvo" ("Landscaping")	0.50	0.5	0.29	
9. SE "Souveniryi" ("Souvenirs")	0.29	0.71	0.37	2.74
10. SE "Rouchniye izdeliya" ("Handicrafts")	0.34	0.66	0.26	1.88

Evaluation of the calculated results of various enterprises' financial stability potentials (Table 9) showed that a number of enterprises have low and even negative financial stability.

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"Orion" has the lowest financial stability potential (-2.07) due to its low equity ratio and high borrowed capital, as evidenced by the ratio of the capital structure. The return on equity is 12%, which is insufficient to maintain the sustainable and dynamic development of this organization.

"OVK" was found to have a relatively high financial stability potential of 5.36. Such capacity has been achieved due to the high value of the coefficient of autonomy, where almost the entirety of its capital is its own and estimates 93%, the share of loan capital is small. This company uses its capital effectively as the return on equity is 43%.

Quite high financial stability potential was shown by "Barkas" (4.23) and "Zelenstroy" (4.45). Average financial stability potential was observed for "Ussuri" and "Souvenirs" at 2.77 and 2.74, respectively. The performance of "Rouchniye izdeliya" can also be attributed to its average financial stability potential of 1.88. "Romashka" is financially unstable (-0.68). "Grand" is in crisis in terms of its financial stability because of its potential for financial sustainability is very low, with a corresponding value of -0.98.

Conclusions

Using the estimation model to determine the various enterprises' financial stability potentials, as calculated on the basis of the regression equation, we can determine the financial stability potential of enterprises via a numeric expression. We were also able to assess the quality of financial stability from the consideration of dynamics and structure, taking into account the variations of the indicators determining the quality of financial stability, to monitor indicators of financial stability potential, tracking, first of all, the most informative parameter of autonomy.

Thus, the financial stability in relation to an individual enterprise can be considered as being the construction of such an internal system of organizing production and financial activities that ensures long-term activity in the market. This can be achieved through effective management of a company's assets using its own and other attracted sources of capital when environmental factors are variable. This is not possible without the effective distribution and use of the enterprise's economic resources, management of the sources of their education, as well as the management of financial risks.

Simply put, an enterprise will be financial stable if it has an internal system of organizing the production and financial activities that ensure its financial stability in the long term.
Thus, the authors use the concept of financial stability, which is defined as follows:
- the ability of the company to continue to achieve its operational goals and fulfil its mission in the long term;
- the ability of an enterprise to undertake continuous production and business activities within the market through the effective management of its financial resources, thus ensuring its creditworthiness and solvency;
- building an internal system of organizing production and financial activities, which ensures continuous activity in the market through balanced asset management, using both its own and attracted sources of capital when environmental factors are variable;maintaining financial stability for a long period of time when environmental factors are variable.

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THE IMPACT OF THE PUBLICATION OF NON-FINANCIAL STATEMENTS ON THE FINANCIAL PERFORMANCE OF COMPANIES WITH THE IDENTIFICATION OF INTERSECTORAL FEATURES

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Abstract. Investor expectations, rather than fundamentals, are increasingly influencing the value of a company. At a time when non-financial assets are becoming an important component of determining the value of the company, the disclosure of non-financial statements as a source of more extensive and meaningful information than financial statements, is becoming an increasingly popular topic of discussion of the scientific and business communities. Non-financial reporting includes "various types of external reporting provided by organizations to their stakeholders and covering those aspects of the organizations that go beyond the historical framework of financial performance". The information contained in non-financial reports can help investors form an opinion about the intellectual, financial, natural, human and social capital of the company and make a decision about investing. In the developed world, the publication of non-financial statements has become a common norm, while in Russia only a small proportion of companies still issue this type of reporting. The study of publishing non-financial reports dedicated to both theoretical and empirical literature, most empirical studies showed a positive effect of issue of non-financial reporting on the financial stability of companies. However, these studies do not focus on the impact of the publication of non-financial statements on the financial performance of companies in Russia. The purpose of this article is to study the impact of the publication of non-financial statements on the financial performance of Russian companies with the identification of intersectoral features. As a result of this study, it will be possible to understand how the disclosure of non-financial information affects the financial performance of Russian companies. From a practical point of view, this can help managers of companies in various industries to realize the importance or, conversely, the absence of the need to publish non-financial statements as a factor that can increase the credibility of the company in the eyes of investors and positively affect the financial results.

Keywords: non-financial reporting; corporate sustainability; corporate social responsibility; non-financial information; cost of the company; financial statements; profitability of assets; sustainable development

JEL Classifications: G30, G31

1. Introduction

Non-financial reporting can be described as the practice of measuring and disclosing information about a company's sustainable development to a wide range of stakeholders, mainly shareholders. Sustainable development is understood to be one in which the needs of present generations are met without compromising the ability of future generations to meet their own needs. The concept of sustainable development consists of three main aspects: economic, social and environmental (Crowther, 2009). The social dimension implies a company's understanding of the impact of its activities on social well-being (both private and global) and a willingness to take moral responsibility for decisions and their consequences in the area of social well-being and inequality. The economic dimension of sustainable development implies the need for efficient and equitable distribution and use of productive resources to maintain a balance between short-term and long-term economic growth. The environmental aspect points to the need to reduce the negative impact of the company's activities on the environment, especially on non-renewable natural resources, as well as the adoption of measures for the transition to environmentally friendly production. Companies include in their reports information on risks and prospects of development on the three most important aspects of sustainable development; on the role of the company in the economy of the region, the country and the world; on social, sports, educational, creative, environmental, charitable and sponsorship events; about conditions and labor protection and health, creation of opportunities for development of employees, etc. Companies' activities towards sustainable development and disclosure of non-financial information have both benefits and costs. Depending on which effect is stronger, disclosure of non-financial information can have both a positive and negative impact on financial performance. Moreover, whether a positive impact will be revealed depends on the characteristics of the country as a whole, and on the specific industry or market in which the company operates, and on the characteristics of the firm. In practice, there are studies that have identified both the presence and absence of a positive relationship.

2. Litreture review

2.1 Studies that revealed the positive effect of the publication of non-financial information on financial performance

Over a long period of time, professionals from various fields analyze whether socially responsible behavior of companies can have an impact on their financial condition, both short-term and long-term. To date, a significant number of studies have been conducted, using various methodologies and samples, which revealed the presence of a positive impact of the publication of non-financial statements on financial performance.

Thus, one of the first studies was the work "Differences in Social-Cost Disclosures: a Market Test of Investor Reactions" (Freedman, & Stagliano 1991). The study followed a decision by the U.S. Supreme Court to require cotton textile mills to disclose compliance with environmental standards. This was a unique case, on the example of which it was possible to observe the reaction of investors. The reaction of investors to the exogenous factor that affected a certain group of companies was studied. In this paper, the estimated effects paradigm is applied in the framework of the standard market model for assessing the reaction of investors to the news that textile factories will be required to meet a new expensive requirement in the field of occupational safety and health. In order to

determine the potential financial impact of the new standard, the sample of companies was divided into subgroups based on the volume and type of information published. In most cases, investors reacted positively to the publication of reports, despite the fact that compliance with the standards meant higher costs for companies. This may have been due to the fact that firms ' reporting became more transparent, resulting in reduced uncertainty and increased attractiveness. This study was followed by many studies that showed a positive relationship between non-financial reporting and financial performance in different samples Pava, & Krausz (1996).

The study "the corporate social-financial performance relationship Preston, & O'bannon (1997) was one of the largest works of the last century, and covered a sample of the largest us companies in the period 1982-1992. The study did not reveal a negative relationship between social and financial success, but confirmed the presence of a positive relationship using different regression models.

However, soon there were studies that questioned the causal relationship between the publication of non-financial statements and financial indicators. Thus, the main argument is that the management of companies begin to pay attention to the issues of social responsibility, when there is a sustainable financial development, that is, the issue of endogeneity. Moreover, not all studies included control variables in the models. Schreck (2011) thus, McWilliams, & Siegel (2010) proved that development and research costs are an important component of models, the omission of which can lead to altered results. In Moore (2001), it was shown that company size also needs to be included in models.

In his study "Reviewing the Business Case for Corporate Social Responsibility: New Evidence and Analysis" Schreck (2011), on the basis of the studied works, he tried to develop a model in which the problem of endogeneity would be absent. The financial success of the company was considered in two categories: balance sheet indicators and market indicators, for which regressions were separately constructed. The author chose ROE as a balance indicator, Tobin's q as a market indicator. Based on 2006 data on three hundred us companies, the OLS regression model was constructed, where the following control variables were included among the explanatory variables: level of social responsibility, size of the company, level of risk and level of leverage. His model showed a positive relationship, but adherence to the concept of sustainable development does not always lead to improved financial performance.

However, the results of such studies can vary greatly depending on the market. Similar studies have been conducted in other samples, including emerging markets. Thus, the study "Environmental disclosure quality: Evidence on environmental performance, corporate governance and value relevance" Iatridis (2013) focuses on the Malaysian market, which belongs to the category of advanced emerging markets. The author examines the relationship between the level of disclosure of information about the company's policy in the field of environmental care and financial performance. The paper describes the relationship between the quality of disclosure and corporate governance, and raises the question of the extent to which the quality of disclosure of environmental information affects the perception of investors. The results of the study showed that disclosure of environmental information is usually correlated with the size of the company, the need for capital, profitability and capital expenditure. High quality disclosure is associated with effective corporate governance, making it easier for companies to access the capital market. Typically, companies with high quality non-financial reporting are serviced by audit companies from the big four, traded on foreign exchanges and show a higher level of managerial and institutional ownership. Thus, the author comes to the conclusion that the publication of non-financial statements really leads to an improvement in the perception of investors and increase the value of the company. He also notes that in Malaysia, the publication is common in such industries as chemical, food, forestry, metallurgy.

The relationship in Finland was confirmed in Communication via responsibility reporting and its effect on firm value in Finland (Schadewitz, & Niskala 2010). The authors investigated how the publication of non-financial

statements affects the value of the company, the object of the study were Finnish companies in the period 2002-2005. The analysis was conducted using a traditional valuation model that included non-financial reporting as a variable. Non-financial reporting was measured as the presence or absence of a non-financial reporting report in accordance with GRI standards. The authors were able to confirm that the communication of the company with agents through the channels of publication of non-financial reporting GRI is an important factor explaining the value of the company. The researchers explain the result by the fact that in this way the firm gets access to the means of communication, which leads to a decrease in the asymmetry of information between managers and investors.

2.2 Empirical studies that have not revealed a positive effect of the publication of non-financial information on financial performance

The study "the relationship between corporate social performance and corporate financial performance in the banking sector" Soana (2011) analyzes the same relationship, but on a specific sector – banking, but it does not reveal a positive effect. The study was conducted on a sample of 68 Italian and international banks in 2005. The impact on financial indicators such as ROA (return on assets ratio), ROE (return on equity-ratio), P/E (price to earning ratio) and MTBV (market to book value) was taken into account. According to the results, there is no statistically significant dependence of indicators of sustainability of banking sector companies and their financial performance. However, it is worth noting that the control variables were not included in the model of this work.

In another study, "The value relevance of intellectual capital disclosures" Vafaei, et al. (2011), on the contrary, was shown that in non-traditional industries (which include the banking sector) presents positive impact of disclosure of non-financial information on financial results. However, in traditional industries such dependence was not detected, moreover, in the sample there were companies from four countries, and the dependence was confirmed in only two of them. Thus, companies from the UK, Austria, Singapore and Hong Kong were divided into traditional and non-traditional industries. The authors studied the impact of non-financial disclosure on the company's net income and assets. In the UK, a positive effect was found in non-traditional industries on both net profit and asset value, while in traditional industries, no such dependence was found. In Austria, the positive impact was also seen only in non-traditional industries, but the positive impact was only on the value of assets, not on net profit. This may be because disclosure reduces uncertainty and also allows investors to reassess the company's intangible assets and improve the long-term Outlook for the company's future earnings, but in the short term this has no impact on profits. In Singapore and Hong Kong, it was not possible to find a significant positive impact. In the sample for traditional industries (without country differentiation), no positive effect was found, and in non-traditional industries, a positive relationship was found. Thus, the presence or absence of dependence is an individual characteristic for different countries and industries.

However, it is worth noting that there were sample limitations in this study. For example, in Hong Kong, companies provided less complete reporting, but there was no differentiation in the quality of reporting provided. Companies from non-traditional industries were on average younger and smaller, but variables (such as company size were not included in the model). It can be assumed that the identified effect for non-traditional industries is not due to the company's commitment to a particular industry, but to the fact that it is younger, which means that investors have less information about it, and the level of uncertainty is higher. In this regard, the disclosure of non-financial information has a significant effect on the perception of the company.

3. Methodology

There are many non-financial reporting standards, and the question for researchers is how to account for disclosure non-financial reporting. Companies are represented on the market, which publish environmental

reports, social reports, reports in sustainable development areas, integrated and industry reports, and they are compiled in accordance with different standards. In this regard, an important question is what types of reporting to use for the study.No less important is the question of the set of financial indicators which to choose as explained. After choosing the indicators to be explained, it is necessary to make a decision on which indicators to take into account as benchmarks.

Financial performance explained

When selecting the indicators to be explained, it is important, on the one hand, to select enough variables to have a complete picture, with on the other hand, not to include too many explicable variables, as it can lead to deterioration of the quality of the study, because either additional models simply will not give new information, or the results may be contradictory. And in a situation when you were not initially selected to explain the main variables that can cause problems with interpretation. C the impact of disclosure is analyzed non-financial information on financial indicators:

1) The ratio of market value to book value (Q-Tobin);
2) Return on assets ratio (ROA).

The basic theory of corporate Finance, the main task management is to maximize the value of the company, that is, actions in interest of investors. In this regard, it was decided to take into account the impact disclosure of non-financial information on market value, however an analysis of the value gain in itself would be incorrect for several reasons. It can be a consequence of changes in the balance sheet the value of assets, such as additional investments or payments dividends'. To avoid inaccuracies, a decision was made analyze the impact on the growth of the ratio of market value to balance sheet (Q-Tobin). Also, this indicator allows you to get rid of errors related to ignoring differences in the capabilities of companies, reasonable different amount of available assets and size. Q-Tobin allows you to analyze the market value taking into account this difference, then there are adjusted for the size of the assets. It was also interesting to see if a gain in the cost of this indicator, it is due to fundamental reasons or such as changing investor perceptions and expectations about future success of the company. For this purpose the decision was made analyze the increase in return on assets as a result of the publication non-financial reporting. Return on assets (ROA) is equal to net income to the value of assets, that is, reflects the change in the fundamental indicator (profitability of the company) adjusted for the company's ability to generate profit (per asset size). Thus, the financial indicators to be explained were one is selected to show the change in investor expectations for firms (Q-Tobin), and one fundamental (ROA). Additional explained variables were not included because they do not research significance was discovered and the interpretation would be difficult.

Accounting for non-financial statements

In this article as examples of disclosure of non-financial information will be considered reports in the field of sustainable development. Most recent studies have examined the impact of this type of reporting on financial performance, due to the fact that it is a fairly complete source of information for various stakeholders. There are several non-financial reporting disclosure standards: the Global Reporting Initiative (GRI), the International Integrated Reporting Council (IIRC), and the Sustainability Accounting Standards Board (SASB). Thus, according to some scientists (Hohnen, 2012), reports on GRI standards most fully disclose information about the company's activities, as well as are the most popular and requested by investors (greenbiz Intelligence Panel Study, 2013). In his work (Daizy & Das, 2014) points out that GRI standards require disclosure based on more than 90 indicators of social responsibility, while other standards-much less.

(Hohnen, 2012) showed that GRI standards are the most used among non-financial reporting companies. According to the study, 95% of American companies, recognized as the most successful in the context of sustainable development in 2010, prepared reports according to GRI standards. Moreover, the GRI standards have been developed including through surveys of different groups of shareholders and reflect information of interest to different investors.

Thus, it is advisable to include in the study sample data on companies that publish reports on GRI standards. However, among the companies there are those that publish high-quality reports on non-financial information, but they are compiled in accordance with other standards. After reviewing their reports, it was decided to include these companies in the sample for several reasons. First, although many reports were not formally prepared in accordance with the GRI standards and are not included in the GRI database, they reflect most of the non-financial information required by this standard. So, not including their selection, it is possible to lose a large number of companies that are relevant for this study. Secondly, there are few companies in Russia compared to developed countries that practice disclosure of non-financial information, moreover, not all of them are available all the necessary information for the study, and the loss of some companies can lead to a significant deterioration in the results of the study. In this regard, this article takes into account all companies that publish reports on sustainable development, data on the publication of reports obtained from GRI sitesIn this article as examples of disclosure of non-financial information will be considered reports in the field of sustainable development. Most recent studies have examined the impact of this type of reporting on financial performance, due to the fact that it is a fairly complete source of information for various stakeholders. There are several non-financial reporting disclosure standards: the Global Reporting Initiative (GRI), the International Integrated Reporting Council (IIRC), and the Sustainability Accounting Standards Board (SASB). Thus, according to some scientists (Hohnen, 2012), reports on GRI standards most fully disclose information about the company's activities, as well as are the most popular and requested by investors (greenbiz Intelligence Panel Study, 2013).

In his work (Daizy & Das, 2014) points out that GRI standards require disclosure based on more than 90 indicators of social responsibility, while other standards-much less. Also, according to (Willis, 2003), GRI provides a reporting structure that can be used by companies regardless of size and industry. In accordance with the recommendations, Companies can independently prepare non-financial statements without the involvement of external organizations and improve their reputation as a socially responsible enterprise.

Statement of hypotheses

The article will analyze how the publication of non-financial statements affects the increase in the ratio of market value to the balance sheet and the increase in the return on assets (ROA). It is assumed that there is a positive effect of the publication of non-financial statements on these indicators.The article will analyze how the publication of non-financial statements affects the increase in the ratio of market value to the balance sheet and the increase in the return on assets (ROA). It is assumed that there is a positive effect of the publication of non-financial statements on these indicators.

Why this article assumes a positive effect disclosure of non-financial information on Q-Tobin? Q-Tobin is one of the most popular explicable financial indicators in such studies. This figure takes into account changing expectations of investors regarding the company's market value to book value, that is, takes into account changing expectations with respect to various parameters influencing the evaluation of future cash flows.

Why is the positive effect of disclosure assumed non-financial information on ROA? As mentioned above, many researchers say predict that investing in programs sustainable development in the long term leads to the growth of the company and an increase in asset-generated profits. Accordingly, and ROA (the ratio of net profit to book value of assets) should will increase. It is also an indicator of the growth of the financial the success of the company to isolate the fundamental parameter.

It seems more logical that the effect on the publication of a non-financial report on Q-Tobin will be more short-term than on ROA. Q-Tobin can quickly change as a result of investors ' reassessment of future cash flows and, accordingly, the value of the company. After the revaluation has already been carried out, the reports published in the past should not affect Q-Tobin. However, if the flow of these funds begins to come to the company and increase profits only in the future, it will be possible to say that the ROA indicator changes as a result of the disclosure of non-financial information with a time lag.

It is also worth noting that for companies from some industries, the effect can be much stronger than for companies from other industries. Investors, who make decisions, pay more attention to different aspects in different industries, and we can assume that for some industries the effect will be particularly strong, while for companies from other industries there will be no positive effect of the publication of non-financial statements on financial performance. In this regard, it was decided to look at the relationship between the disclosure of non-financial information and financial indicators not only in the whole sample, but also to study the effect on different industries.

The article will be tested the following hypotheses:

(H1) the Publication of non-financial statements results in an increase in the ratio of the market value of capital to the balance sheet starting in the year following publication.
(H2) the Publication of non-financial statements results in an increase in return on assets starting in the year following publication.
(H3) the effect of the publication of non-financial statements on the ratio of the market value of capital to the balance sheet is not evident in all industries.
(H4) the effect of the publication of non-financial statements on return on assets is not apparent in all industries.

The methodology for selecting explanatory variables was as follows: first, on the basis of logic and literature, a list of possible control variables was built (ROE, book value of assets, EPS, leverage, R&D expenses to revenue ratio, revenue volume), subsequently, to test the tests for significance and multicollenarity, the variables were left to explain Q-Ttobin: book value of assets, leverage, and to explain ROA: book value of assets, EPS, leverage.

The proposed set of explanatory variables included such indicators as company revenue (Sales) (Lopez, Garcia, Rodriguez, 2007) and EPS, as changes in stock returns can stimulate or discourage investors to make a decision in favor of investing in the company, and therefore affect the financial success. Moreover, ROE was included in the list of supposed explanatory variables, since, presumably, like EPS, it can influence the mood of investors, and thus the demand for the company's shares, and therefore the financial performance. Also, the growth of financial indicators is affected by the value of this indicator in the past year, so to explain the growth of Q-Tobin in the model was included Q-Tobin of the previous year, and to explain the growth of ROA-ROA of the next year. The model was included Q-Tobin of the previous year, and to explain increase in ROA-ROA of the previous year.

The sampling design

The sample included companies for the period 2008-2018. The following data were uploaded for each company.

The first part of the sample companies (companies that published non-financial reporting), was compiled according to the following criteria:
1. Availability of publication of non-financial statements in accordance with lists of companies from the GRI website at least in one year.
2. Commercial public company.
3. Availability of financial information required for research (in Bloomberg or in reporting on the company's website).

The second part of the sample companies (companies that have not published non-financial reporting), was compiled according to the following criteria:
1. The company has never published financial statements (there is no information about the publication on the GRI website).
2. Commercial public company.
3. Belonging to the industry in which companies are present, publishing non-financial statements.
4. Availability of necessary financial information.

After cleaning the data the sample consisted of 106 companies 8 industries economies. Among these companies, 62 have published non-financial statements at least once and 44 have never published them. Companies that did not publish reports were selected in this way so that each sector has the same structure of companies, publishing and non-publishing reports. However, the full the symmetry of the companies could not be preserved for several reasons. Thus, almost all companies with financial performance data related to "basic materials " publish non-financial statements, so we had to choose between the number of observations and maintaining the similarity of the structures of the two subsamples: publishing and non-publishing companies. The choice was made to retain the sample size. This is not a big limitation, and the vast majority of studies analyzing the effect of non-financial disclosure have been conducted on asymmetric samples.

The following figures for 2008-2018 were uploaded for all companies (Table 1):

Table 1. Financial performance

Indicator	Formula	Description	Expected direction of influence on explained variables
RETURN_ON_ASSET	Net income / Assets of the company	A measure of how profitable a company is in relation to its total assets, as a percentage. ROA gives an idea of how effectively management manages the assets of the company for profit.	Explained
RETURN_COM_EQY	Net income / equity	A measure of the company's return on funds invested by shareholders, as a percentage.A measure of the company's return on funds invested by shareholders, as a percentage.	Positive
TOBIN_Q_RATIO	market value of the company / book value of the company	The ratio of the market value of the company to the book value. The Tobin ratio is based on the hypothesis that in the long run the market value of the company should be approximately equal.	Explained
EPS	Net income / number of common shares	Represents the proportion of the company's profit distribution among shareholders.	Positive
RD	The costs of research and development / revenue	Reflects the ratio of total research expenditure to developments that include R&D in the income statement and loss account and capitalised R&D to revenue during the period's.	Positive
TOTAL SALES	Total revenue	Characterizes the total amount of income received by the firm during the year.	Positive
BS_TOT_ASSET	Book value of assets	The total amount of all current and long-term assets recorded in the balance sheet. Displays the size of the company, in our model will play the role of a control variable.	Positive
TOT_DEBT_TO_ EQUITY	the company's debt / equity	The coefficient determines the total amount of debt on relative to assets; allows you to compare leverage between different companies.	Negative
Published	Published=1 if there are non-financial statements; Published=0 if there are no non-financial statements.	Dummy is a variable that indicates whether a company has published information about non-financial indicators or not.	Positive

Source: GRI (2019). Sustainability Reporting. https://www.globalreporting.org/information/sustainability-reporting/Pages/default.aspx

After collecting panel data, it was decided to exclude variable "the ratio of research expenditures to revenue» There were a lot of omissions in the R&D spending data, which could not be recovered even after searching for information in reports on company websites. When trying to replace omissions with "averages", the R&D variable was negligible. When companies that do not have R&D data are excluded from the sample, the sample is greatly reduced. Therefore, it was decided not to include this variable in the analysis. In total there were 261 observations with publication and 312 observations without publication of non-financial statements.

Descriptive statistics

Despite the fact that there were 162 companies mentioned in the lists of companies that published non-financial statements on the GRI website, only 62 companies met the criteria for entering the sample, for these companies there were 261 observations in just 10 years. The number of companies that did not publish reports is 44, the number of observations is 312.

Despite the fact that there were 162 companies mentioned in the lists of companies that published non-financial statements on the GRI website, only 62 companies met the criteria for entering the sample, for these companies there were 261 observations in just 10 years. Quantity companies that have not published reports -44, the number of observations 312. Below is the distribution of observations by year (Table 2).

Table 2. The number of observations in the time section.

Year	Number of published companies	Number of unpublished companies
2018	37	41
2017	32	35
2016	29	34
2015	30	36
2014	28	29
2013	27	27
2012	25	25
2011	22	29
2010	13	24
2009	11	18
2008	7	14

Thus, it was found that on average, companies that publish non-financial reporting, larger. This can be seen from Table 3, which shows the ratio of the average book value of companies, non-financial statements, to the average book value companies that do not publish non-financial statements. Almost everything this ratio was more than one. When interpreting the results it should be noted that the first group of companies, on average, had more financial opportunities.

It is also worth noting that on average, Q-Tobin is higher in companies, publishing non-financial statements. This can be seen from (Table 3), reflecting the Q -Tobin ratio of published companies to unpublished. As you can see, every year this ratio is greater than 1, so in companies that publish non-financial statements have more than I'm Tobin. This allows us to make the assumption that the publication of non-financial statements leads to an increase in the ratio of market value to book value. However such assumptions can be too hasty, since the inverse relationship is likely: more large and successful companies take care to disclose non-financial information.

Table 3. The ratio of the average TA, Q- Tobins and ROA of published companies to unpublished

Year	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
TA	2.434	1.902	1.841	1.786	0.980	1.154	2.288	4.015	3.154	6.018	5.318
Q	3.144	4.801	1.649	2.357	4.212	3.210	6.237	8.531	6.104	4.714	3.246
ROA	1.014	0.849	1.084	0.724	0.991	0.674	1.463	2.100	1.151	0.986	0.768

It can also be seen from Table 3 that there is no clear heterogeneity in a sample of the return on assets. The ratio of the average the ratio of profitability of published companies to unpublished in four years more than one, and six years less than one.

Next, we pay attention to the correlation of dependent variables (Table 4).

Table 4. Correlation matrix of explanatory variables.

	roa	roe	tobins_q	eps	total_assets	total sales	debt_to_equity	published
roa	1.00	0.52	0.05	0.06	0.01	0.64	-0.32	0.11
roe	0.52	1.00	0.20	0.08	0.02	0.32	-0.15	0.06
tobins_q	0.05	0.20	1.00	-0.01	-0.06	0.44	0.30	0.05
eps	0.06	0.08	-0.01	1.00	0.00	0.10	0.00	0.04
total_assets	0.01	0.02	-0.06	0.00	1.00	0.32	-0.03	0.11
total sales	0.64	0.32	0.44	0.00	0.32	1.00	0.11	0.28
debt_to_equity	-0.32	-0.15	0.30	0.00	-0.03	0.11	1.00	-0.07
published	0.11	0.06	0.05	0.04	0.11	0.28	-0.07	1.00

Interestingly, the debt_to_equity parameter is negatively related to ROA and ROE, while positively associated with Q-Tobin. That is in our sample the following trend is observed: the higher the financial leverage, the lower Forty one return on equity and return on equity, while leverage is positively related to the company's market value ratio to the balance sheet. We assumed that leverage would be negatively related as with ROA, so with Q-Tobin, since big leverage means risk. However, as can be seen, the connection with Q-Tobin is positive, this can be explained by the fact that companies that borrow money save on taxes, which leads to increase the value of the company. However, with ROA, the relationship is negative. In addition, Q-Tobin was negatively related to EPS and asset value (TA), other variables correlate positively.

4. Results' analysis

To begin with, the H1 and H2 hypotheses were tested, which state that there is a positive relationship between the publication of non-financial statements and the Q-Tobin and ROA coefficients, respectively.

The first step was to build a regression in which all variables were included:

$$
\begin{aligned}
Q, ROAdel = {} & \beta_1 + \beta_2 TA + \beta_3 Q + \beta_4 DE + \beta_5 TS + \beta_6 EPS + \beta_7 ROA + \beta_8 published(t) \\
& + \beta_9 published(t-1) \\
& + \beta_{10} published(t-2) + \cdots + \beta_{14} published(t-6) + U_i
\end{aligned}
$$

where Qdel- $\dfrac{Q_{t+1} - Q_t}{Q_t}$ (Q-the ratio of market value to book value in the corresponding year);

published (t) - dummy variable that displays the presence or absence of a non-financial report in period t;
TA – the value of total assets, reflecting the size of the company;
DE - the ratio of debt to equity;
TS-total revenue;
EPS-earnings per share;
ROE-return on equity;
Q-the ratio of market value to book value in the period t.

Lags greater than the sixth degree were not included, since it was decided that this only complicate the model. However, there were minor variables in the original model and multicollinearity was present, which was detected by the VIF test (Table 5):

Table 5. The results of VIF test for the inclusion of all variables (H1), (H2):

Variable	VIF (H1)	VIF (H2)
TA(total asset)	1.23	2.14
Q-tobins	1.43	1.06
DE	2.05	2.44
TS	10.04	6.42
EPS	9.36	3.12
ROE	8.16	11.14
published(t)	12.56	11.11
published(t-1)	3.08	4.01
published(t-2)	2.76	2.91
published(t-3)	1.27	1.45
published(t-4)	1.70	1.99
published(t-5)	1.11	1.09
published(t-6)	1.08	1.04

H1: After the VIF test, it was decided to remove from the regression such explanatory variables like TS, EPS, ROE. This will not lead to a significant deterioration in predictive power, as the data the variables were not of high importance or were insignificant: p-value for TS, EPS, ROE was equal to 0.09; 0.34 and 0.08, respectively Since published (t) has a high VIF, it cannot be included in the regression. It was decided to divide the hypothesis testing into two stages: first, to check the significance of the published (t) coefficient, and then to include lags in the model to analyze the presence of long-term influence.

H2: It was decided to remove the variables TS and ROE, their p-value were 0.11 and 0.26, that is, they were not significant. By analogy with the hypothesis 1 test, two regressions were constructed: one involving the variable published (t) and the variables with lags.

And so, models were built:

Model 1 (H1).

$$Qdel = \beta_1 + \beta_2 TA + \beta_3 Q + \beta_4 DE + \beta_5 published(t) + U_i$$

Model 2 (H1).

$$Qdel = \beta_1 + \beta_2 TA + \beta_3 Q + \beta_4 DE + \beta_5 published(t-1) + \beta_6 published(t-2) \\ + \beta_7 published(t-3) + +ublished(t-6) + U_i$$

Model 3 (H2).

$$ROAdel = \beta_1 + \beta_2 TA + \beta_3 ROA + \beta_4 EPS + \beta_5 DE + \beta_6 published + U_i$$

Model 4 (H2).

$$\begin{aligned} ROAdel = {} & \beta_1 + \beta_2 TA + \beta_3 ROA + \beta_4 EPS + \beta_5 DE + \beta_6 published(t-1) \\ & + \beta_7 published(t-2) \\ & + \beta_8 published(t-3) + \cdots + \beta_{11} published(t-6) + U_i \end{aligned}$$

The following estimates were obtained for the first (H1) and third (H2) models (Table 6):

Table 6. Coefficients for model 1 (H1) and 3 (H2)

	Coefficient		P-value	
	Model 1 (H1)	Model 3 (H2)	Model 1 (H1)	Model 3 (H2)
const	0.11	0.06	0.14	0.004
TA	-0,57**	0,415**	0.03	0.07
Q	0.024*		0.08	
ROA		-0.031*		0.13
DE	-0,592***	-0,713***	0.009	0.012
EPS		0,182*		0.07
published	0,08**	0,066	0.089	0.23
R²	0.284	0.371		

Model 1 (H1): An F-test was conducted on the insignificance of regression, which rejected the null hypothesis of insignificance. It has been hypothesized about regression insignificance, f-statistic = 2184, which is significantly critical values at any reasonable level of significance, so in General the regression equation is significant.

Model 3 (H2): When the regression significance test was performed, F-statistic = 24 was obtained, which is greater than the critical value, this suggests that Model 3 is generally significant.

During the Broich-Pagan test for models 1 and 3, statistics not exceeding critical values were obtained, which means that the model there is no problem of heteroskedasticity.

Next, a VIF test was performed to test multicollinearity for models 1 and 3 (Table 7).

Table 7. VIF test of the first and third models

Variable	VIF	
	Model 1 (H1)	Model 3 (H2)
TA	1.033	1.15
Q	1.019	
ROA		2.40
DE	1.289	3.01
EPS		2.82
published	1.110	1.15

The VIF of all explanatory variables is about 1, thus, the absence of multicollinearity in models 1 and 3 is confirmed. Accordingly, H1 about the presence of a positive effect are confirmed.

Next, it was interesting to see if there was an impact on the horizon of more than one year. Model 2 (H1) and Model 4 (H2) were constructed to analyze the longer-term effect (Table 8).

Table 8. Coefficients for model 2 (H1) and 4 (H2)

	Coefficient		P-value	
	Model 2 (H1)	Model 4 (H2)	Model 2 (H1)	Model 4 (H2)
const	1.06	-1.3		0.05
TA	-0.34**	1.2	0.03	0.06
Q	0.16*		0.11	
ROA		1.05		0.05
DE	-0.36**	0.93	0.02	0.05
EPS		0.05		0.14
published(t-1)	0.13*	0.475	0.063	0.06
published(t-2)	0.34	0.267	0.14	0.05
published(t-3)	-0.42	0.041	0.22	0.08
published(t-4)	0.31	1.06	0.15	0.13
published(t-5)	0.21	0.65	0.28	0.16
published(t-6)	0.51	2.65	0.15	0.21
R^2	0.34	0.41		

During the Broich-Pagan test for models 2 and 4, statistics not exceeding critical values were obtained, which means that the model there is no problem of heteroscedasticity (Table 9).

Table 9. Second model VIF test:

Variable	VIF	
	Model 2 (H1)	Model 4 (H2)
TA	1.167	3.11
Q	1.402	
ROA		2.16
DE	1.004	1.09
EPS		1.97
published(t-1)	2.793	2.13
published(t-2)	2.536	2.35
published(t-3)	1.364	3.14
published(t-4)	1.866	1.96
published(t-5)	2.004	2.14
published(t-6)	1.646	3.11

Thus, H2 confirmed, we can argue that the publication of non-financial statements also affects the financial performance in the longer term.

Next, we check the implementation of the third (H3) and fourth hypothesis (H4) that the presence of non-financial reporting publication has a positive effect on the Q-Tobina not in all industries. To do this, regressions were constructed for each individual industry, and by analogy with the testing of the first and second hypotheses, a regression was first constructed, in which the variable "published" of period t was included, and then" published " of the previous periods. It should be noted that in each sector there are from 8 to 20 companies, but to build a regression on two observations does not make sense, so it was decided to build regressions only for five sectors in which there are at least 10 companies: Basic Materials, Energy, Financial, Industrial, Utilities. It is worth noting that in the energy sector, each company at least once published non-financial statements, but there are many observations when in a particular year, less than half of the companies disclosed information, so at this stage we will consider including the energy industry.

So, first, five additional regressions were constructed for each of the five selected sectors.

Regression explained the Q-Tobin gain $\frac{Q_{t+1}-Q_t}{Q_t}$, investigated the significance of having a non-financial reporting reporting period t:

Model 5(H3)

$$Qdeli = \beta_1 + \beta_2 TAi + \beta_3 Qi + \beta_4 DEi + \beta_5 published(t)i + U_j$$

where i =1,2,3,4,5 corresponds to the branch number.

Hypothesis three tested by analogy with the third, in the fourth hypothesis as the explained variable was the parameter increase ROA: $\frac{ROA_{t+1}-ROA_t}{ROA_t}$. As a model, the equation was constructed, which was used when

testing hypothesis 2 on the impact of non-financial disclosure despite the increase in ROA, however, it was now considered separately for each industry:

Model 7(H4)

$$ROAdeli = \beta_1 + \beta_2 TAi + \beta_3 ROAi + \beta_4 EPSi + \beta_5 DEi + \beta_6 published(t)i + U_j$$

where i =1,2,3,4,5 corresponds to the branch number.

The following coefficients were obtained (Table 10):

Table 10. Coefficients for model 5 (H3) and 7 (H4)

	const	*TA*	Q	ROA	EPS	DE	published	R²
Basic materials, Coef (H5)	2.1*	0.06	1.2**			-1.0***	0.11**	0.34
Basic materials, Coef (H7)	1.4	0.04*		0.8***	1.6	-2.1***	-0.04	0.38
Basic materials, p-value (H5)	0.08	0.14	0.02			0.008	0.04	
Basic materials, p-value (H7)	0.11	0.09		0.004	0.14	0.006	0.13	
Energy, Coef (H5)	-1.8	0.003**	0.15*			-2.9	3.18	0.68
Energy, Coef (H7)	-3.4	1.04***		2.4	-1.1*	0.46*	0.12*	0.48
Energy, p-value (H5)	0.03	0.04	0.09			0.12	0.14	
Energy, p-value (H7)	0.16	0.004		0.19	0.09	0.07	0.1	
Financial, Coef (H5)	0.1*	-1.2*	0.21**			0.16*	-0.9	0.22
Financial, Coef (H7)	-1.6	0.20**		2.1**	0.19*	-1.14*	0.3	0.52
Financial, p-value (H5)	0.8	0.07	0.04			0.08	0.11	
Financial, p-value (H7)	0.9	0.04		0.04	0.1	0.09	0.14	
Industrial, Coef (H5)	1.2	0.18***	1.2*			-0.4*	-2.1	0.41
Industrial, Coef (H7)	0.2	-0.8*		1.4*	1.22	-1.2	0.4*	0.26
Industrial, p-value (H5)	0.16	0.009	0.07			0.09	0.18	
Industrial, p-value (H7)	0.26	0.08		0.06	0.18	0.19	0.09	
Utilities, Coef (H5)	1.4	-0.8	1.0**			-0.6**	0.43*	0.36
Utilities, Coef (H7)	1.4**	1.08		-0.09**	1.6	-1.3**	0.71*	0.31
Utilities, p-value (H5)	0.14	0.13	0.03			0.02	0.06	
Utilities, p-value (H7)	0.04	0.11		0.02	0.15	0.03	0.06	

Significance tests indicated that all five equations are significant, also, according to the Broich-Pagan test, they lack heteroscedasticity.

(H3): as can be seen from the table, the availability of publication of non-financial statements the growth is positively affected by Q-Tobin not in all industries. Importance found only about the industries "basic materials" and "utilities".

(H4): as can be seen from the table, the availability of publication of non-financial statements not all industries have a positive impact on ROA growth. Importance found only about the industries "Energy", "Industrial" and "Utilities".

As a result of the analysis it was found that the publication of non-financial information has a positive effect on the growth of Q-Tobin's and ROA (hypothesis 1 and 2). Is worth it should be noted that the effect on Q-Tobin is manifested immediately in the year following reporting, and on ROA in the longer term: the effect is evident one year after the reporting year. This phenomenon is probably due to the fact that revaluation of market value by investors when information becomes available happens faster than the return on assets changes, so the effect on Q-Tobin is faster than on ROA.

However, you need to check how what impact takes place in more long term (Table 11-12).

Model 6(H3)

$$Qdeli = \beta_1 + \beta_2 TAi + \beta_3 Qi + \beta_4 DEi + \beta_5 published(t-1)i$$
$$+ \beta_6 published(t-2)i + \beta_7 published(t-3)i + \beta_8 published(t-4)i$$
$$+ U_j$$

where i =1,2,3,4,5 corresponds to the branch number

Model 8 (H4)

$$ROAdeli = \beta_1 + \beta_2 TAi + \beta_3 ROAi + \beta_4 EPSi + \beta_5 DEi + \beta_6 published(t-1)i$$
$$+ \beta_7 published(t-2)i + \beta_8 published(t-3)i + \beta_9 published(t-4)i$$
$$+ U_j$$

Table 11. Coefficients for model 6 (H3)

Variable (chg_tobins_q)	Basic Materials	Energy	Financial	Industrial	Utilities
TA	-0,055	-0,500**	-0,551*	-0,21*	-0,511**
Q	-0,01*	0,01	0,019	-0,001	0,008
DE	-0,501**	-0,344**	-0,578*	-0,211*	-0,396***
published (-1)	0,013*	0,016*	0,013	0,014*	0,01*
published (-2)			0,014	0,006	0,007*
published (-3)	0,010	0,013			0,018*
published (-4)	0,006	0,017*	0,017	-0,007	0,017
R²	**0,171**	**0,278**	**0,142**	**0,157**	**0,15**

Table 12. Coefficients for model 8 (H4)

Variable (chg_roa)	Basic Materials	Energy	Financial	Industrial	Utilities
intercept	-0,02	0,013	-0,009	-0,002	0,003
eps	0,07*	0,081*	0,029	0,048	0,065*
tot_assets	-0,365**	-0,694**	-0,568*	-0,408**	-0,581**
debt_to_assets	-0,648***	-0,25***	-0,475***	-0,312**	-0,445***
published (-1)	0,012*	0,029**	0,003	0,006	0,016
published (-2)			0,003	0,004	0,014*
published (-3)	0,016	0,008			0,018*
published (-4)	0,018*	0,022*	0,015	0,016	0,018
published (-5)		0,012*		0,012	
published (-6)	0,015	0,015*			0,021
R²	**0,218**	**0,315**	**0,201**	**0,167**	**0,169**

The results of the study indicate that the effect of the publication of non-financial statements depends on the industry of the company. Hypotheses 3 and 4 that there is a positive effect from the publication of non-financial reporting on Q-Tobin (H3) and ROA (H4) not all industries have also been confirmed. Interestingly, the financial sector lacks any meaningful the impact of the publication of non-financial information on the financial performance.

Conclusions

First, we note that in General, the impact of the publication of non-financial this has a longer term effect on ROA gains and more the effect on the Q-Tobin coefficient increase that is, the effect on Q-Tobin manifests itself faster. This can be explained by the fact that Q is Tobin -short-term / medium-term revaluation of the company's value by investors based on a change in the existing dataset, while the ROA –directly reflects the success of the company in terms of more the fundamental indicator is net profit, which changes over a longer period of time.

Secondly, we note that the analysis by sector gives more accurate picture of how non-financial information has a big effect on the financial indicators. Thus, the impact of the publication of non-financial statements had a significant positive effect on the growth of Q-Tobin in next year only in sectors such as Basic Materials and Utilities, while while the effect on ROA growth in the following year was found in - Energy, Industrial, Utilities. It is worth noting that in all regressions the R^2 is small, that is the explanatory power of the models is not very high, so the results cannot be to be considered unconditional. This is easily explained by the fact that much of the recent change in financial indicators was due to changes in market conditions and non-financial factors that are not taken into account in the model. Nevertheless, the results indicate the presence of intersectoral differences. Note that the long-term effect (the largest lag) non-financial information is observed in such industries as Energy, Basic Materials, Utilities; what can also find a reasonable explanation.

The model based on companies from the energy sector has sufficiently high explanatory force R2 = 0,315. Just like in others for example, the Broich-pagan test was conducted, which did not reject the hypothesis that the variance of individual effects is zero, as well as the VIF test, showed the absence of multicollinearity.

Note also that for the financial sector the publication is non-financial information did not have a significant impact on financial indicators in any in the short term, nor in the long term. In general, the financial sector appears to be less focused on social issues, such as environmental concerns and social welfare.

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NAVIGATING ON THE KEY DRIVERS FOR A TRANSITION TO A GREEN ECONOMY: EVIDENCE FROM WOMEN ENTREPRENEURS IN SOUTH AFRICA[*]

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Abstract. This research aims to determine how women entrepreneurs engaged in green entrepreneurship can help build a green economy in South Africa. The study was conducted using a non-probability conveniently selected sample of women green entrepreneurs operating in Gauteng Province, South Africa. A qualitative approach was followed involving semi-structured face to face interviews and focus groups with the selected participants. The collected data were analysed using thematic analysis. After the thematic analysis, four themes (drivers) for a Transition to a Green Economy emerged, which are green entrepreneurship education, the need for financial resources, green women entrepreneurs networking programmes and implementation for new green policies. The findings of the study will assist determine how women entrepreneurs work and engage in the green sector. Furthermore, this research makes a valuable contribution towards creating new knowledge in the green entrepreneurship sector by comprehending how women can help build a greener economy in South Africa.

Keywords: green entrepreneurship; women entrepreneurs; green economy

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1. Introduction

Women have been looked down on for so long in the postmodern era, and because of this they are now growing in academic, economic, social, and business circles to alter the world around them (Shava, 2018). Similarly, in the past few decades, it was unimaginable for women to own businesses and successfully manage to run them in South Africa, however the present day state of affairs as confirmed by the World Bank (2017), shows that women entrepreneurs now account for a quarter to a third of all businesses in the formal economy worldwide. This confirmation points to the reality that women entrepreneurs are not simply redefining the role of women in the economic sphere, they are setting precedence by molding the contemporary overall economy. Women entrepreneurship is widely acknowledged as a precondition for sustainable economic growth and development in any country (Shava, 2018), however, very little is known about women entrepreneurial activities and the key drivers for transitioning to a green economy as enabling factors for including their business subsistence and growth strategies. According to Halvorsen (2015:1), "the concept of knowledge for viable democratic growth raises the question of how knowledge can contribute to the creation of an alternative political system that can replace what regulates, subjugates and exploits so much of the globe and its assets in the short-term interests of an insignificant minority, particularly women." For the Sustainable Development Goals (SDGs) discussions that arose from the UN's Post--2015 Development Agenda (UN 2013), accepting the transformation of the world economic system is essential (ICS / ISSC 2015; UN 2015). The problem of poverty that has paralyzed the entire world, particularly Africa, must be eradicated by providing imperative trade for all the economically active citizens of our planet, particularly females, through green entrepreneurship. Women are opening their own companies in record numbers in today's vibrant global economies, meaning women-owned companies are a noticeable proportion of all companies (Nxopo & Iwu 2015). Chinomona and Maziriri (2015) also agree that females are increasingly turning to entrepreneurship as a manner to cope with the' glass ceiling,' which seems to stop them from achieving the highest levels of organizational management. Women have realized that in terms of company projects they can do what people do, or even better than others (Singh 2012). Mangin (2014) points out that females contribute to a country's green industry's increased accessibility of human resources by investing in their children's well-being and proper education. In addition, Roy (2012); Irene (2018) describe that women entrepreneurs are significantly contributing to environmental resource protection. There is a lot of attention paid to enpowernment of women (Yenilmez, 2018; Islam et al., 2018; Schouten, 2019; Kamasturyani et al., 2019; Fenech et al., 2019; Pinem, 2019). Furthermore, a major problem in South Africa is the lack of empirical studies on women entrepreneurs' contribution to the South African green economy and limited studies relating to the general profile of women green entrepreneurs in South Africa are available (IDC, 2017).

Women are progressively considered to play an important role in transforming nations with developing economies into a greener economy and reducing poverty (Mangin 2014). Hechavarria, Ingram, Justo and Terjesen (2014) point out that, compared to their masculine counterparts, females have greater environmental attitudes and are more likely to stress environmental issues. This is consistent with a research undertaken by Braun (2010) to determine whether women entrepreneurs may be more involved in green issues than their masculine counterparts. This is consistent with a research undertaken by Braun (2010) to determine whether women entrepreneurs may be more involved in green issues than their masculine counterparts. The research disclosed that female participants had greater environmental attitudes and dedication to green entrepreneurship than men, implying that female entrepreneurs may be more involved in green issues than masculine businessmen (Braun, 2010). In another current research that Ambepitiya (2016) undertook to explore the role of women entrepreneurs in developing countries in building sustainable development. The findings of the study showed that female entrepreneurs encourage green practices. More specifically, the research results examined that women entrepreneurs operate their companies in ways that minimize adverse environmental impacts and encourage green marketing, advertising and employment procedures (Ambepitiya 2016). Sumathi, Anuradha and Akash (2014) say that being a green business owner can provide significant, economically rewarding, socially accountable and

environmentally useful jobs. At the same moment, it can assist females with their ambitious dedications to balance their family life (Sumathi, Anuradha & Akash 2014). This paper will clearly highlight how research on women entrepreneurs in South Africa has tended to focus more on the informal sector while research on experiences and aspirations of South Africa's green economy has been relatively limited.

Research questions
The main research questions to emerge from the scope of the study are as follows:
- Can green entrepreneurship lead to a green economy?
- Can women entrepreneurs who are engaged in green entrepreneurship lead South Africa in the transformation to a greener economy?
- What opportunities and challenges emerge for women's participation in the green economy?
- Is the South African government supporting green entrepreneurial activity among women entrepreneurs?

2. Problem statement and research gap

Green entrepreneurship is viewed from a development view as an increasingly relevant trend; however, the literature survey indicates that it is still mainly under-researched (Ahmad, Halim, Ramayah, & Rahman, 2015). Despite expanding research on entrepreneurship, O'Neill and Gibbs (2016) also point out that in-depth qualitative empirical research with green entrepreneurs has been restricted to date, concentrating instead on typologies that categorize certain' kinds' of green entrepreneurs. Previous research in South Africa has examined female entrepreneurs in different situations by concentrating on the problems faced by women entrepreneurs in the Gauteng province of South Africa (Chinomona & Maziriri 2015). In addition, Mandipaka (2014) focused on an overview of women entrepreneurs in South Africa. Furthermore, the barriers that hinder the success of women entrepreneurs in Gauteng, South Africa were investigated by Khalwaya and Havenga (2012). Additionally, Chiloane and Mayhew (2010) determined the difficulties experienced by black women entrepreneurs in accessing instruction from the South African Small Business Development Agency. Moreover, Meyer (2009) investigated the determinants of women's entrepreneurship. Against this background, there is a lacuna in studies that are centred on women who are engaged in green entrepreneurship and hence, the fundamental motivation behind this investigation is to fill this gap.

Significance of the Study

The research investigated a present-day significant and topical development problems not only for developing nations but all over the globe, namely moving towards a green economy through the implementation of green entrepreneurship among women entrepreneurs. Promoting women's entrepreneurship in green or organic cooperatives is a comparatively fresh idea that continues to evolve in practice when coupled with marketing and abilities development training, it has the potential to foster women's entrepreneurship, women's revenue generation and women's empowerment as well as help them reduce poverty (Sanyang & Huang 2008). Akpunonu and Muogbo (2015) opined that investing in women is recognized not only as the right thing to do but also the smart thing to do. Therefore, the knowledge generated by this study is useful not only to South Africa, but also to other developing countries in the area of women entrepreneurship and green entrepreneurship.

3. Overview of the Gauteng Province

This paper aims to gather information that can be applied in the development of women who are engaged in green entrepreneurship within the Gauteng province of South Africa. Figure 1 presents a geographical map of the Gauteng province of South Africa.
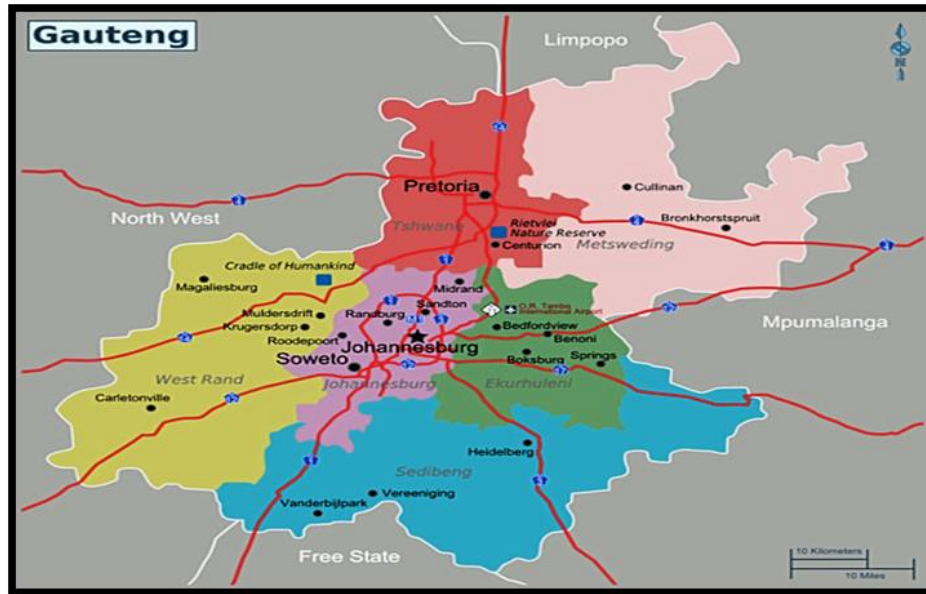
Figure 1. Map of Gauteng Province of South Africa
Source: http://www.south-africa-tours-and-travel.com/map-of-johannesburg-south-africa.html

South Africa's Gauteng province is in the country's north-central portion (Senatla 2011). According to Meyer (2009), the Gauteng Province is South Africa's biggest financial sub-region: it accounts for 19.7 percent of the country's total population and about 40 percent of the national product. Chinomona and Maziriri (2015) point out that Gauteng is not just South Africa's economic hub, which makes a major contribution to the financial, production, transportation, technology and telecommunications industries. It also hosts, more than any other country on the continent, many overseas companies requiring a commercial base in, and gateway to, Africa.

Knight, Harland, Telgen, Thai, Callender and McKen (2012) explain that Gauteng is South Africa's smallest province with a 21,025 km region. Although Gauteng is only 1.7% of South Africa's total region, 18.5% of South Africa's total population resides in the province (Knight, Harland, Telgen, Thai, Callender & McKen 2012). Jogee and Callaghan (2014) believe that Gauteng, with the largest urbanization rate, is the most populous province. Gauteng's Green Strategic Program (2011) points out that Gauteng is South Africa's financial engine, and sub-Saharan Africa, the province may be economically rich, but it is poor in terms of water, air and soil. Moreover, Gauteng is also beginning to feel the rebound effects of previous outsourcing of unsustainable development expenditures, such as polluting mining activities, which will affect the province's economic competitiveness and job creation potential (Gauteng's Green Strategic Program, 2011).

4. Literature Review

Literature review plays a key role in the ongoing studies. Efforts are aimed in this chapter to investigate or evaluate the results of the research undertaken in the same field by different academics. Furthermore, this chapter is based on a literature review of all appropriate materials including study studies, articles, case studies, surveys and project reports released by UN agencies, international organizations and academic problems related to female entrepreneurs, the role of female entrepreneurship in South Africa's financial development, green entrepreneurship and the green economy. Also collected and studied were national reports, policies, strategies and future plans concerning women entrepreneurs.

5. Theoretical grounding

This research takes as its theoretical framework the concept of ecological modernization. This is because the theory of ecological modernization can be deemed critical to the development of green entrepreneurial projects by women entrepreneurs in South Africa's Gauteng province.

5.1 Ecological Modernization Theory

The theory of ecological modernization (EMT) suggests that continued industrial development, rather than inevitably continuing to degrade the environment, is the best way to escape the global environmental challenge (York & Rosa 2003). The environmental issues facing the world today function as a driving force for future industrial activity and economic development (Murphy 2000), according to the Ecological Modernization Theorists. McEwen (2013) says that with the concept of ecological modernization, financial growth can be encouraged by providing the environment a greater priority. Furthermore, EMT's father Joseph Huber (Mol 1995) emphasizes that entrepreneurs are the key agents of change in the transformation process in order to prevent an ecological crisis (Gibbs 2009; Mol & Spaargaren 1993; Tillery & Young 2009). It can be observed that EMT talks about capitalizing on the setting without harming it based on the explanations of the authors. Furthermore, if consideration is given to the EMT, it may improve the growth of women entrepreneurs involved in green entrepreneurship.

5.2 Women Entrepreneurs

While growing numbers of females are becoming leaders of their own companies, shedding light on what it entails to be a woman entrepreneur is essential. Chinomona and Maziriri (2015) describe a female entrepreneur as a female who plays a captivating role by interacting and adapting herself constantly with fields of economic, socioeconomic and social assistance. Maheshwari and Sodani (2015) also agree that a female entrepreneur is an individual who accepts a difficult position in meeting their private requirements and becoming economically autonomous. According to Manerkar (2015), women entrepreneurs can be well-defined as females or a group of females initiating, organizing and running a company. Women entrepreneurs are those who have started and have been actively engaged in managing companies; own at least 50 percent of the company and have been in service for a year or longer (Xavier, Ahmad, Nor & Yusof 2012).

5.3 The Role of Women Entrepreneurship in the Economic Development of South Africa

The key to unlocking economic growth is South African women entrepreneurs. Women constitute 52% of the total population in South Africa, and several surveys demonstrate that more females have been engaged in entrepreneurship since independence was achieved in 1994 (Deborah, Wilhelmina, Oyelana, & Ibrahim 2015). Akhalwaya and Havenga (2012) point out that the most significant assets of any nation are those of human capital and since females make up more than half of South Africa's inhabitants, they are the one resource that needs to be brought to the mainstream of the economy. Chinomona and Maziriri (2015) explain that women entrepreneurs from South Africa are engaged in survival processes such as sewing cooperatives, chicken farming, candle making, gardening, and arts and crafts. According to Akhalwaya and Havenga (2012), their business contribution is mainly in the fields of craft, hawking, personal services and retail. Furthermore, the role of a female entrepreneur is obvious in the growth of leadership, management, innovation, efficiency of research and development, job creation, competitiveness, productivity, and the formation of new sectors (Nxopo 2014). Van der Merwe (2008) argues that female entrepreneurship is growing quickly and that females are growing and starting their own business to take control of their personal and professional lives. Nxopo (2014) stressed that the role of these female entrepreneurs in eradicating poverty and unemployment in South Africa cannot be underestimated and research on the contribution and growth of female entrepreneurs at all levels of the South African economy is needed. Meyer (2009) points out that women entrepreneurs are increasingly seen as important to economic development and contribute not only to job creation, but also to the diversity of entrepreneurship in the economic process. In addition, it can be observed from the author's explanations that female entrepreneurs

have become significant players in the entrepreneurial landscape by making contributions to business development in South Africa.

5.4 The Green Economy

Hassan and Nordin (2016) explain that the main focus of the green economy is on the junction between the location and the economy. According to the United Nations Environment Program (UNEP), (2011) a green economy is viewed as a system of economic activity that includes the production, consumption and distribution of goods and services to enhance the quality of life of people. The Green Economy notion is also defined as an economy in which economic growth and environmental responsibility operate together in a mutually reinforcing fashion while promoting progress on social development, enhancing human well-being and social equity at the same time (Creech, Huppé, Paas & Voora, 2012). As a result, one of the green economy's most important goals is to avoid future generations from significant environmental hazards and economic scarcity (UN Environment Program, 2011). Greening the economy in South Africa is particularly important for two fundamental reasons: (1) the country's exceptional level of unemployment and (2) the economy's high carbon impact (Borel-Saladin & Turok 2013). Furthermore, according to the International Labor Organization (ILO) (2016), the South African government views a green economy as a sustainable development route, based on addressing the interdependence between economic growth, social protection and natural ecosystems, and has a number of substantial projects underway to promote the Sustainable Development Goals (SDGs) in the field of sustainable development. In addition, Uslu, Demir and Hancioglu (2015) explain that the advantages and disadvantages of a green economy transition on their paper. These are indicated in Table 1.

Table 1. The advantages and disadvantages that may arise during and after the transition to green economy

Advantages	Disadvantages
Developing of new production options: new products having new functions suited to maximize the utilization rate and value, new processes and forms of industrial symbiosis able to achieve higher and higher levels of global performance and to continuously reduce the unit incidence of the amount and cost for energy and materials in the whole production cycle and, at the same time, the amount of emissions and wastes.	High prices for energy and mineral resources. High prices for agro-food and agro-industrial resources.
Development and maturation of new technologies in all fields of activity, giving rise to a wide range of equivalent solutions able to satisfy more appropriately the local and global needs and aims (foodstuffs included).	High investment costs for the development of new technologies in all fields (for research, in all forms, and at all levels).
Easy, eco-compatible and economic end of life of goods (disassembling, recovering, recycling).	Production cost and market price increases of durable goods, having sustainable features (functions to increase their use intensity and durability). Deep modification of the hierarchy of goods and in branches of activity (industry and service sector).
Improvement of enterprises' competitiveness through the qualification achieved with adoption of sustainable management criteria. Birth and increases of small to medium sized service and technical assistance firms and new employment creation. Assumption by enterprises, singly and as a system of social responsibility in a way to increase their competitiveness and contribute to spread the culture of resource conversation as a reference point in all choices	Reduction of produced volumes by enterprises and of their mission, nature, size and relations. Increased unemployment levels (mainly from large industries).
Increase overall resources productivity and reduce the demand for energy and other natural resources	Probable decrease of global and per-capita wealth (GNP) in industrialized countries. Reduction of average buying power of families.

Restoration of original environmental balances	Enormous costs for transforming cities and metropolitan areas to achieve sustainable living and working places.
Redistribution of wealth between industrialized and non-industrialized countries (if the latter start appropriate development phase).	Enormous investment costs to invent and produce new transportation and accessibility systems that are low material intensive, energy efficient, fast and safe, ecologically sound and economically advantageous.
Great improvement of the quality of life in the sustainable cities starting from the quality of air, water, living standards, quality and safety of mobility.	
Reduction of mobility time to work and for other personal needs, reduction of transportation costs, increased resource productivity, reduction of pollution connected to new material and energy-intensive, long-life transportation means and increase in safety	

Source: Ulu, Hancioglu and Demir (2015:124)

5.5 Green entrepreneurship

Green entrepreneurship is lauded as one of the main mechanisms to leverage in making the step towards the green economy (Ahmad, Halim, Rahman & Ramayah 2015:91). Pastakia (1998) earlier defined green entrepreneurship as an effort by entrepreneurship to propagate environmentally friendly practices by market or non-market methods. Kotchen (2009) indicates that green entrepreneurship can be characterized as the practice of starting up new companies in reaction to a recognized chance to gain a profit and provide (minimize) beneficial (adverse) environmental externality. Pachaly (2012) defines green entrepreneurship as entrepreneurs using open space business tools, develop wildlife habitat, save endangered species and generally improve environmental quality. Moreover, the "green" entrepreneurship is an economic activity whose products, services, methods of production or organization have positive effect on the environment (Gevrenova 2015).

6. Methodology and Design

The research design that was adopted for this study was essentially exploratory in nature. The exploratory approach, in this case, was expected to provide the opportunity to unravel the views of green women entrepreneurs pertaining to green entrepreneurship and its ability to lead them towards a green economy. The rationale for using exploratory research was to obtain a richer understanding of green entrepreneurship in the pursuance of their businesses. Essentially, and in keeping with the approach stated above, during the interview, participants were given the opportunity to describe their views of green women entrepreneurs pertaining to green entrepreneurship and its ability to lead them towards a green economy. The researchers adopted a qualitative approach that was exploratory in nature. The reason for adopting qualitative methodology was the need to understand the experiences of women green business owners. Chinomona et al. (2014) point out that in a qualitative research, the researcher builds a complex, holistic picture; analyses words; reports detailed views of informants; and conducts the study in a natural setting. In addition, Xaba and Rankhumise (2014:184) noted that 'the qualitative research method is appropriate when the researcher is trying to understand a new phenomenon in a particular situation rather than trying to establish a relationship between two or more variables.

6.1 Research paradigm

A research paradigm refers to a set of philosophical assumptions and beliefs that directs the research (Jonker & Pennink 2010). According to Wahyuni (2012) research is commonly divided into four paradigms which are positivism, post-positivism, interpretivism, and pragmatism. This study subscribes to the interpretive paradigm. According to Thanh and Thanh (2015) interpretivism usually seeks to understand a context, and the core belief of the interpretive paradigm is that reality is socially constructed. Creswell (2009) clarifies that interpretive methodology is directed at understanding phenomena from an individual's perspective, investigating interaction among individuals as well as the historical and cultural contexts which people inhabit. Interpretivists believe an

understanding of the context in which any form of research is conducted is critical to the interpretation of data gathered (Thanh & Thanh, 2015).

6.2 Unit of analysis

A unit of analysis is defined as the main body that is being analysed in a study (Antonites & Kliphuis 2011). In this study, the unit of analysis is the South African green women entrepreneurs residing in the Gauteng province of South Africa.

6.3 Population of the study

In research, population refers to the aggregate of all the units that are eligible to participate in a study (Creswell & Plano, 2007:112; Salkind, 2012:95). In addition, Welman, Kruger and Mitchell (2011:53) defined population is as a group of entities with a common set of characteristics. In this study, the population of relevance will consist of all green women entrepreneur living within the Gauteng province of South Africa.

6.4 Sample size

A sample can be defined as a portion of a larger population (Dube, Roberts-Lombard & Van Tonder, 2015:243). Roets (2013:36) defines sample size as the count of factors involved in the study. A sample size larger than 30 and less than 500 is appropriate for most research studies (Xaba & Rankhumise, 2014; Choto et al., 2014:97). Therefore, this research study utilized 35 participants.

6.5 Sampling technique

Dahlberg and Mccaig (2010:175) assert that two methods exeunt for sampling, namely probability and non-probability sampling. As there was no register of women green entrepreneurs, convenience sampling method was used to select the respondents. The respondents were chosen for providing inside information about green entrepreneurship.

6.6 Face-to-face interviews

Interviews provide an avenue for generating data by talking to people about how they go about their day-by day dealings (Thompson, Bounds, & Goldman, 2012:40). The researcher managed to conduct the interviews while at the same time recording the interviews and taking short notes for future coding. The general observation was that each interview would trigger the necessity for another interview as the themes began to unfold. The convergent in-depth interviewing used in this study allowed the researcher to develop, clarify, verify and refine the core issues of the interview protocol. During the early stages, the content of the interview was unstructured and flexible to allow the interviewees to communicate freely their experiences and considered views concerning the green entrepreneurship and its ability to lead them towards a green economy. The process used in the interview became more structured as the interviewer converged in specific issues of the research problem and sought further clarifications on certain issues. Finally, after conducting a total of fifteen (15) interviews the researcher felt it was enough but needed to further corroborate the findings with the data from five more informal conversations. During the informal conversations, field notes were also taken, and memos developed thereafter. Unlike in quantitative research, qualitative research views literature review as an ongoing process and serve as a source of data (Wilson, 2010). As put forward by Wilson (2010), literature from documented material should be viewed equally the same as field notes. The same point was buttressed by Bryman (2004) who referred to documented literature as "everything is data" and Cooper and Schindler (2011) who asserted that a "cache of archival material" is equivalent to a collection of interviews and field notes. These documents served two purposes. Firstly, they were treated as another source of data collection. Secondly, as noted by Enslin (2001), prior reading provided models to help the researcher make sense of the data gathered on SDGs and green entrepreneurship and probe further the interviewees where necessary.

6.7 Focus group

A focus group of six female entrepreneurs was performed in the research. These women entrepreneurs classified themselves as green women entrepreneurs because they focus on green entrepreneurship in their businesses. For instance, selling energy-efficient lighting, having an environmentally friendly beauty salon, viable farming, and manufacturing as well as selling environmentally friendly soap. Focus group is a form of quantitative research in which a group of people are asked questions about their opinions, perceptions, beliefs and attitudes towards a product, service, concept or idea (Wilson, 2010). Bryman (2004) and Cooper and Schindler (2011) defined a focus group as an interview conducted by a trained interviewer among a small group of respondents. Questions are asked in an interactive group setting where participants are free to give views from any aspect and talk with each other. Focus group allows interviewers to study people in a more natural conversation pattern than typically occurring in a one to one interview. Fairly low cost compared to surveys, as one gets results relatively quickly and increase the sample size of a report by talking to several people at once. However, there is the disadvantage of observer dependency raising questions of validity unless the interviewing of the focus group is repeated several times (Zikmund, Babin, Carr & Griffin, 2010). The next section focuses on a comprehensive discussion of the findings.

7. Data analysis

All interviews were documented and transcribed for analysis. The study employed a qualitative research design using thematic analysis. The Grounded Theory technique is a systematic approach encompassing the discovery of theory through the analysis of data. After verbatim transcription of the face-to-face interviews and focus group interviews, the researchers analyzed all the records of the interviews by using the process suggested by Corbin and Strauss (1990). The researchers recommended the utilization of the following procedures in the data analysis:

Open coding: According to Corbin and Strauss (1990:4) "open coding is the process of breaking down, examining, comparing, conceptualizing and categorizing data". The researchers began data analysis by interpreting the recorded notes and paying attention to the interviews documented on tape to familiarize themselves with the data. This stage was important to ensure that the researchers captures all the important points raised by respondents in the focus group interviews and to establish the depth of the data.

Axial coding: According to Madinga and Maziriri (2018), axial coding involves reading the transcribed notes again to identify the connections between the themes that emerged from open coding. The researchers reviewed the themes to analyses the relationship between themes and sub-themes. Themes that were related, were further collapsed to come up with one dominant theme.

Selecting coding: "selective coding is the procedure of selecting the core category, systematically relating it to other categories, validating those relationships, and filling in categories that need further refinement and development" (Corbin and Strauss 1990:5). This procedure was undertaken to identify the main themes that were related to the study (Cresswell 2014), and draw conclusions grounded on the emerged themes.

8. Findings

The main findings obtained from the focus group and the transcripts of the interviews were green entrepreneurship education, the need for financial resources, the need for networking events among green entrepreneurs and the need to implement for new green policies. These results are described as topics emerging from a method called thematic analysis in the following parts (9.1 to 9.4). Thematic analysis is defined as "a meticulous process of identifying, analysing and reporting themes that emerge from a qualitative study" (Mupohi, 2015:168; Muposhi, Dhurup & Surujlal, 2015:230; Retief, 2009:42; Braun & Clarke, 2006:79). Thematic analysis is considered the "fundamental method of qualitative analysis" and was chosen to formally trade the analytical process due to its suitability to the exploratory character of the research (Apolloni, 2010:88). "The main advantage of the thematic analysis is that it is a logical process which allows the researcher to scrutinize interview transcripts comprehensively and glean all possible themes'' (Muposhi, 2015:168; Muposhi, Dhurup & Surujlal,

2015:230; Glesne, 2011:187). The following framework indicates the main themes identified in the data sources. Each theme will be discussed individually, followed by substantiating quotes. Interpreted data will be compared with existing literature.

8.1 Theme 1-Green entrepreneurship education

Green entrepreneurship education emerged during interviews as one of the most important topics. The green women businessmen have stated a need for green education. Furthermore, the respondents (green women entrepreneurs) stated that training entrepreneurs about green entrepreneurship is essential for universities and other tertiary education organizations. Here are some of their comments:

"*Although I am a green entrepreneur, I wish to obtain more knowledge of green entrepreneurship from universities as the issue of going green is topical in today's postmodern era*" [Thandeka, Seller of Energy Efficient Lighting]

"*As women, if we are to be thought about the benefits of green entrepreneurship, we can be at the forefront of motivating the entire nation to transit to a green economy*" [Charlotte, Green Florist]

8.2 Theme 2- The Need for Financial resources

Another theme that emerged from interviews was the need for financial resources. Most of the participants attested that there is need for the government to allocate more financial resources to women entrepreneurs especially those are still at the introductory stage of green entrepreneurship. This was reflected by the following statement:

"*There are some machineries that I would need to have in my eco-friendly beauty salon, but I can't acquire them all because there are expensive. I wish if the government would recognise us as green entrepreneurs in terms of financial support*" [Jenny, Eco-Friendly Beauty Salon owner]

8.3 Theme 3- Green women entrepreneurs networking programmes

Green women entrepreneurs networking programmes appear to be one of the dominant themes that emerged from interviews. The study's theme encompasses a socioeconomic green business activity by which green women entrepreneurs meet to form business relationships and to recognize, create, or act upon business opportunities, share information and seek potential partners for green ventures. The participants expressed themselves as follows:

"*For South Africa to end up being a green economy it is imperative to have networking programmes centred on green business issues*" [Hope, Green Fair Organizer]

"*With networking programmes, I believe we will be able to share green business ideas as well as to make partnerships with other green entrepreneurs, this will ultimately assist South Africa to transform into a green economy*" [Samantha, Eco-Friendly Toy Seller]

8.4 Theme 4: Implementation for new green policies

"*I personally feel that, although there is the South African Environmental Act, other environmental policies should be drafted and come into effect so as to have strict measures of developing our country towards a green economy*" [Eco-Friendly Soap Maker]

"*It would be imperative for the government to introduce some penalties to those who harm the environment which we live when conducting their business operations. It might be harsh but after negative reinforcement works*" [Pamela, Sustainable Farmer]

9. Conceptual Model

After thematic analysis of research data, a conceptual model was developed. Below is an illustration of the research conceptual model. Above is an illustration of the research conceptual model of the current study. After analysis of themes observed in the study, it was found that green entrepreneurship education, the need for

financial resources, green women entrepreneurs networking programs and implementation for new green policies be categorized as key drivers for a transition to a green economy among women green entrepreneurs in the Gauteng province of South Africa.
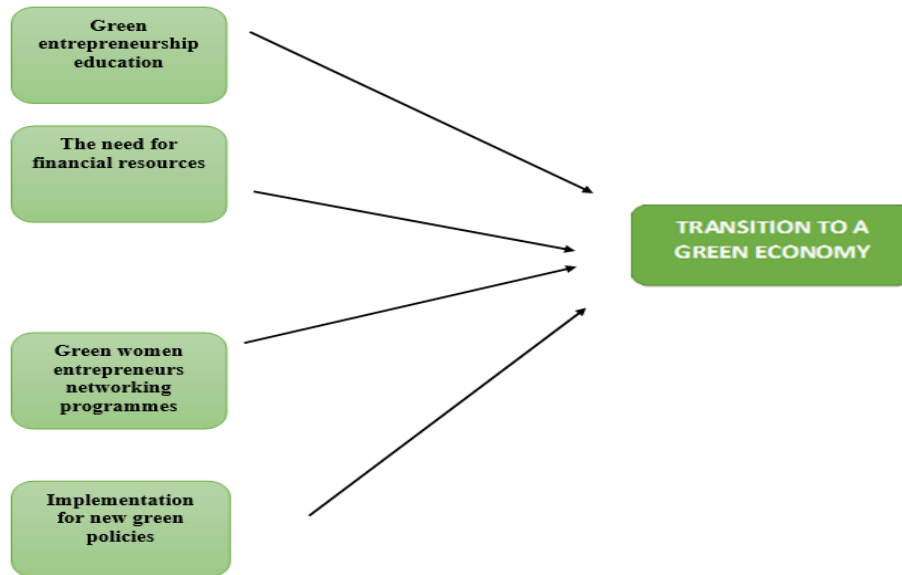
10. Recommendations

Especially among black women, a spirit of green entrepreneurship needs to be instilled in the Gauteng province because efficiency and effectiveness are still below the level needed. Since the remnants of its apartheid regime, South Africa is one of the poorest countries in Africa (Meyer & Hofmeyer 1995; Enslin 2001; Soudien 2004). Much requires to be done to have effective and efficient education that results in worldwide competitiveness and green entrepreneurship for companies. To be of high quality, up to standard and applicable to the recipients, our green entrepreneurship thinking still needs to be improved. In terms of gloomy entrepreneurs, universities alone cannot make the change on their own, it requires participatory approach from all angles. This will efficiently and effectively create the conversion. It does not result in any criticism from other areas of society as there will be space for everyone to be involved. Although a participatory strategy is so laborious, and it takes too long to transform greater learning institutions and thus improve entrepreneurship (Radebe 2013). Therefore, much requires to be done to change teaching methods and go for green entrepreneurship.

Government needs to allocate more financial resources to women entrepreneurs, particularly those still in the introductory phase. All South African greater education organizations need to alter curricula and concentrate more on green entrepreneurship. For its students, the quality of learning and teaching and the shift from a teacher-centred approach to a more learner-centred approach means putting the needs of the learner at the heart of activities (Chinomona et al., 2013). It is also essential to note that some of these learners are not empty vessels. They should be allowed to make their own decisions and learn on their own concerning green entrepreneurship.

11. Implications of the study

The present study is an effort to conduct research in a context that is often most ignored but is significant in the South African business industry. Consequently, the results of this empirical research are anticipated to have to provide fruitful consequences across all stakeholders in tertiary schools in South Africa to put more emphasis on green entrepreneurship as it gives money to government, offers jobs and poverty alleviation. All individuals need to be engaged in decision making for the efficacy to be realized, including the parents. Therefore, this research argues that educational leadership formulating strategies that lead to high-quality education makes higher learning institutions pleasant areas to work for and be appreciated. In the manner they do their stuff, top management will learn and alter for the better and concentrate more on green entrepreneurship as it gives more money to the state and the individuals involved. But much is required to realize this dream of green entrepreneurship by contributing appropriate funds.

In order to contribute to the SDGs, knowledge generation on green entrepreneurship must be secure in their independence and work in universities with academic autonomy. Acceptance that the opportunities for these institutions to massively increase their income streams in the near future are slim. Thus, affordable incentive schemes that have the potential to reward academics and encourage independent research will help a great deal in terms of green entrepreneurship. A number of the 17 SDGs are relevant to the issue of a new global political economy and Objective 8, in this respect (promoting sustainable, inclusive and sustainable economic growth, complete and productive jobs and decent work for all) is often quoted as particularly appropriate. Discussions on the SDGs so far indicate a high amount of consciousness that racism and other types of prejudice have the potential to undermine any alternatives to the worldwide environmental problems facing humanity, as well as the need to ensure the fundamental right of every individual to an honourable life.

12. Limitations and Future research

Despite this study's contribution, it has its constraints that provide opportunities for future research, since this current study only focused on the province of Gauteng. Perhaps if the collection of data is extended to include other provinces such as the Eastern Cape, Free State, KwaZulu-Natal, Limpopo, Mpumalanga, Northern Cape and North West, the results may be more insightful. Therefore, future studies should consider this recommended direction of research. Furthermore, the information gathered are based on only women entrepreneurs' reactions. While women may be the top green entrepreneurs, there are males involved in green entrepreneurship, and their contribution to putting South Africa forward towards a green economy is also of paramount significance. Perhaps above all, insightful findings can be produced if men entrepreneurs are to be interviewed. There is also the issue of common method bias due to the pure use of qualitative research in this study. It was going to be more robust if the study included both qualitative and quantitative methods. All in all, these suggested future avenues of study stand to immensely contribute new knowledge to the existing body of green entrepreneurship literature, a context that happen to be less researched by some researchers in Africa.

13. Conclusion

In summation, extensive literature review was conducted in this study to spawn an overview or to gain a depth understanding of green entrepreneurship. This study offers a comprehensive analysis of the key drivers that are necessary in transitioning towards a green economy in the context of South African female entrepreneurs. This study further provides a basis for an agenda for enhanced focus on training and development of the entrepreneurial competencies of female green entrepreneurs in South Africa. On the academic side, this study makes a significant contribution to the green entrepreneurship literature by systematically exploring the impact of green entrepreneurship, efficiency and effectiveness in the context of women entrepreneurs in the Gauteng province.

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THE ROLE OF SPENDING ON EDUCATION AND SCIENCE IN SUSTAINABLE DEVELOPMENT

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Abstract. Azerbaijan is an exporter country of natural resources (oil). Since the main power of modern economy including the future economic progress is human factor, human capital, its knowledge, ability of using technology, transferring oil capital into human capital is a driving factor. That's why researching the influence of the main indicators of education and state budget allocations for it is a topical issue. The article has researched the relationship of state budget allocation and the main indicators of education and science during 21 years (1996−2017) in the Restate of Azerbaijan. Auto Regressive Distributed Lags has been used as a research model. Besides, stationary tests of variables (Augmented Dickey Fuller, Phillips-Perron, Kwiatkowski-Phillips-Schmidt-Shin) and Pairwise Granger Causality Tests were used. Model stability was studied. Eviews_9 software program was applied for making graphics and calculations. Research has examined that there is a positive dependency between state budget allocation and the main indicators of education. We recommend that state budget allocation for science and education can be increased and used as the intended purpose.

Keywords: education; science; spending; sustainable development; ARDL

1. Introduction

Human capital is the main resource in economy. The increasing role of human capital is related with geometric sequence rather than arithmetic sequence of events and processes. The 50−60s rapid development is related with the development of technologies, especially information and communication technologies and their employment

on production spheres. And the human capital plays important role for all of these. All these achievements are related with knowledge, science and education.

Nowadays, scientific and intellectual potential has become an important factor in the development of our country (İbrahimov et al. 2019). Providing a reliable guarantee to the rapid economic development and to progressive reforms in all spheres of state life is important in Azerbaijan recently. The reforms that we meet the requirements of new stage of development has implemented in a systematic way and has shown the effectiveness of the policy that calculated on the basis of the objective of a strong human capital formation. Today, science and education serve not only to the cultural development of society and to improve the living conditions and welfare of people but also to prevent the negative tendencies, acts of primitive thinking causing the eradication of social institutions since ancient times almost without administrative intervention. If we don't consider the achievements of science and education, the facts itself show that countries with high levels of science and education witness fewer criminal cases.

If today the vector of global thinking focuses on building a civil society and observes the peak of human development for it can only be achieved by applying scientific achievements and enhancing the intellectual level of people. The restoration of social justice, the rise of material and moral values, and the global economic development are the only factors. Therefore, some kind of competition has already begun for this purpose among 200 countries of the world. The state policy pursued in Azerbaijan is based on this direction. Transition of Azerbaijan's existing economic potential into intellectual wealth − human capital − has been declared the main strategic course. A lot of important work is being done in this area too. This trend towards the development of science and education, as well as the development course in this field, is now accompanied by greater achievements. In this regard, state programs have been adopted, which are aimed at integrating into the world of science and education, and steps towards these goals are consistent.

1.2. Hypotheses

Hypotheses:
- − science and education are the main factors of economic development (sustainability);
- − macroeconomic indicators of science and education are directly dependent on funding;
- − diversification of funding for science and education has a positive impact on sustainable development.

2. Literature review

2.1. Science, education and sustainable development

The agenda of UNO XXI conference (1998) states that education plays an essential role for our future prosperity. Since then, education has been the main focus of the purpose, essence and terminology of sustainable development (Sjöström, Rauch & Eilks, 2015). It must be noted that sustainability was formed in forestry in XVI century in Europe (Burmeister et al. 2012).

Undoubtedly, science and technology is the basis for economic sustainable development of each industrialised society (Bradley 2005; Ware, 2001). Although science and technology is a leading factor, education is considered one of the main attributes of sustainable development as well (Bradley 2005). Gough Stephen and William Scott researched the Great Britain education system and summarized that education has been under state control for 150 years and included sustainable development plan since 1992 (Gough & Scott, 2006).

Inarguable, science is one of the bases of sustainable development. Sustainability problem and the bases of science changes regularly in the world (Humbatova & Abidi, 2019). Not only does knowledge and science

contribute to ignore difficulties, but also it supports innovation and draws young talents attention for sustainability problem (Wilbanks & Thomas 2010).

There has been a growing interest to high education for sustainable development (the growing number of scientists, academicians and students) in the last 20 years (Hallinger & Chatchai, 2019). Hallinger and Chatpinyakoop analysed that 64% of scientific researches concerning HESD have occurred in the last 5 years (2013−2018). This tendency proves that scientists are interested in HESD (Hallinger & Chatchai, 2019). Science and technological potential and education are undeniable factors to solve problems related to regional sustainable development (Keane & Allison, 1999) and ecology (Zilahyg & Huisingh, 2009). Universities significantly impact on regional sustainable development (Arbo & Benneworth, 2007; Stephens et al., 2008; Wals, 2009). Higher education plays an important role in sustainable development in global scale (Yuan & Zuo, 2013; Hien & Cho, 2018; Girdzijauskaite et al., 2019).

Higher education is an igniting factor for sustainable development (Holbrook, 2009). Among different entities, universities take a great role in sustainable development context (Cortese, 2003; Fien, 2002). Education for sustainable development is a political purpose and a good notion from education point of view (Burmeister, Rauch & Eilks, 2012). However, the biggest contribution of education to business, state and society is to prepare specialists for this purpose (Chalkley, 2006; Wals, 2013).

Angely V. Malenkiy, Endy Green researched the role of education in globalisation and its relationship with sustainable development in China, India, Kenya and Sri Lanka (Little, & Green 2009). Elein Nevin examined the mutual relationships between education and sustainable development as well as with ecology in Ireland (Nevin, 2008). CIS economists have also researched education, science and sustainable development problems (Muradov, Hasanli & Hajiyev, 2019; Muradov, Hasanli & Musayeva, 2019; Mukhtarov et al., 2019).

2.2. Science, education and economic growth

Liu and Bi has researched the influence of production factors on higher education (Liu & Bi, 2019) and Crespo has examined the role of education with sustainable development (Bárbara et al., 2017).

Although some economists give a positive feedback about the influence of education on economic growth and development (Tvaronavičienė, Tarkhanova & Durglishvili, 2018; Tvaronavičienė et al., 2017), some others prove the opposite (Wolff, 2001; Vedder. 2004; Hanushek, 2016; Sun, Ning & University, 2016).

Zhou and Luo researched the mutual relationship of technological innovation with higher education in China through VAR method in 1997–2015 (Zhou & Luo, 2018). On the other hand, mutual relations of education and employment rate, trade and economic growth in Pakistan (Butt & Hassan, 2008; Hassan & Butt, 2009), and the impact of education on production factors and productivity in Nepal (Dahal, 2015) were studied.

They proposed that municipalities must play a crucial role for the preparation of regional programs. The distribution of resources and finance among regions will stimulate the formation of human capital. In other words, the formation of human resources differes depending on the regional features. Besides, the role of economic growth on science has been in the centre. Wang and Huang researched empiric analysis the mutual relations of science and technology and economic growth in agriculture (Tianqi & Lijun, 2018).

Slottje (2010) was inspired by the importance of human capital development on economic growth so that this fact has played as a motivation factor for the research. Lyakurwa (2019) proved that human capital development improves knowledge and habits of human capital and as a result, it increases GDP.

In another research, it has been proved there is a positive correlation between educational entities and labour market. Thus, a good specialist acts as a basis of economic development (Ahmed & Liu, 2019).

2.3. Finance of education and science

Finance and expenses of education and science has been in the centre of attention of scientists. Resnik researched the important aspects of finance and economics for science (Resnik, 2007). Besides Resnik, some scientist has touched a burning issues such as the influence of R&D finance on scientific productivity (Jacob & Lefgren,2011), the influence of state finance contracts on scientific productivity in Spain (Alonso−Borrego, Romero−Medina & Sánchez−Mangas, 2017), the importance of state policy of R&D works for engineers and scientists in the USA (Goolsbee, 1998), the connection between financeial sources for science and scientific articles (Lesser et al., 2007), the influence of allocated investment by Congress on the development of universities (Payne & Siow, 2003), bibliometric analysis of scientific works financed by South Africa (Albrecht, 2014), the influence of financial resources on the development of science in the USA (Whalley & Hicks, 2014) and the usage of scientific articles for evaluation of R&D expenses in the USA (Wagner, 1996).

The impact of state academic researches and financial sources on R&D (Goldfarb, 2008), the assessment of finance on science (Lane, 2009), the real effects of academic researches on R&D works of universities and commercial entities (Adam, 1989), the role of economics on the formation of science (Stephan, 2012), the influence of state education expences on the increase of GDP per person in Tunisia and Marocco (Adel, & Guetat, 2018) have been researched.

Lamartina and Zaghini (2011) examined state expenses role in economic growth in 23 OECD countries and concluded that there is a positive correlation between state public expenses (education, helath etc) and GDP per person. Thus, the increase of expenses concerning human capital causes GDP per person. Besides, Ogujiuba and Adeniyi (Ogujiuba & Adeniyi, 2005) researched the influence of state expenses on education in Nigeria. The relations between current expenses of education and economic growth are statistically significance. However, this relation is not observed for the investment on education.

Summarizing the literature review, research on this topic is not sufficient. Thus, public and private expenses on education and science, especially the influence of science and education on economic indicators is still new.

3. Data and methods

3.1. Data

Statistical data encompasses 1995−2017. Data have been taken from Statistics Committee of the Republic of Azerbaijan.

Table 1. Macroeconomic indicators of science and education

Year	The number of students at the higher education institutions – total, person	The number of master students at the higher education institutions (admission) – total, person	The number of bachelor students at the higher education institutions (admission) – total, person	The number of graduated students at the higher education institutions – total, person	The number of Phd students – person	Admis-sion to Phd programs – person	The number of graduated Phd students, person	The number of institutions for doctorate degree	The number of students on doctorate degree program – person	The admis-sion to doctorate degree progra m – person	The number of doctorate degree graduate students – person	Budget expenses (education and science) −mln.manat
1996	102742	1795	22127	19377	1306	386	307	23	65	19	6	524671
1997	100180	1877	23487	24274	1347	303	274	19	78	19	6	689482
1998	106482	1991	26817	21113	1218	253	368	25	83	23	18	870840

1999	116115	2544	24605	20030	907	151	418	23	55	10	36	903591
2000	119683	2752	26403	24488	963	367	321	21	47	9	22	1006196
2001	120453	3390	26944	23903	982	292	244	16	40	17	7	1069655
2002	120039	3827	19681	27795	1059	303	202	17	58	18	7	1013345
2003	121535	4470	25438	28460	1178	398	260	19	57	14	15	1305812
2004	127248	5455	26988	31232	1318	470	320	20	68	14	6	1641415
2005	129948	3236	28747	32508	1479	503	317	21	80	18	8	2037197
2006	129141	2757	23873	28141	1705	550	340	19	80	17	11	5,33E+08
2007	130430	3404	25846	31279	1681	452	431	24	83	19	20	7,76E+08
2008	136587	3265	28765	32580	1636	455	503	31	93	22	25	1,04E+09
2009	139194	3934	29822	34591	1084	51	593	32	64	20	43	1,23E+09
2010	140241	3698	29904	31071	786	5	455	26	91	13	13	1,27E+09
2011	143146	4225	31212	30812	897	677	396	74	185	168	10	1,37E+09
2012	145584	4746	33327	35128	1601	814	232	74	411	219	44	1,57E+09
2013	151274	5514	35370	33758	2070	625	131	74	426	134	7	1,66E+09
2014	158212	4 913	35 801	32 826	2 400	629	377	64	535	129	50	1,8E+09
2015	161234	4953	33645	33705	2282	558	636	78	593	94	66	1,72E+09
2016	163779	5098	36126	36951	2182	420	543	77	541	101	79	1,86E+09
2017	167677	6 515	38 546	37 506	2 168	455	529	88	555	129	69	1,85E+09

Note: www.stat.gov.az

3.2. ARDL method

Cointegrated ARDL method is as developed by Pesaran and others (Pesaran, Smith & Shin, 2001). However, this method has a number of advantages comparing previous cointegration methods (Pesaran & Shin, 1999; Oteng−Abayie & Frimpong, 2006). This sample yields more reliable results when there are a few of them. Meanwhile, Ordinary Least Squares (OLS) method must be used for assessment. However, there is no endogenic problems in ARDL econometric modelling. Thus, it is possible to assess short and long−term coefficients within one model. We can calculate not differing the variables whether there are I(0) or I(I) or mixed in ARDL model (Frimpong & Oteng−Abayie, 2006; Sulaiman & Muhammad, 2010). Obviously, while I(0) and I(1) are used, series variables are known to what extent they are stationary and are defined by the single root test (ADF, PP, KPSS). ARDL assessments contain of the below−mentioned steps. 1) Unlimited Error Correction Model (UECM) is established. The mathematical expression of the model is as the following:

$$\Delta Y_t = a_y + \sum_{i=1}^{n} \beta_{yi} \Delta Y_{t-i} + \sum_{j=0}^{n} \gamma_{yi} \Delta X_{t-J} + \theta_{y1} Y_{t-1} + \theta_{y2} X_{t-1} + \varepsilon_{yt} \tag{1}$$

$$\Delta X_t = a_x + \sum_{i=1}^{n} \beta_{xi} \Delta X_{t-i} + \sum_{j=0}^{n} \gamma_{xi} \Delta Y_{t-J} + \theta_{x1} X_{t-1} + \theta_{x2} Y_{t-1} + \varepsilon_{xt} \tag{2}$$

In equation 1 and 2 two−variable ECM structure (one dependent and one indidependent) was indicated. Y and X are both independent and dependent variables interchangably. a Indicates independent limit of the model and ε shows white noise error. θ_i is for long−term coefficient, β_i and γ_i is for short term coefficients.

2) Having established ECM in ARDL, the existence of cointegration relationships between variables are checked. For this, zero hypothesis is checked through Wald test (or F test) on θ_i for a long−term coefficient ($H_0 : \theta = \theta_y = \theta_x = \cdots 0$). The alternative hypothesis proposed is the existence of cointegration analysis among variables ($H_1 : \theta \neq \theta_y \neq \theta_x \neq \cdots 0$).

The existence of cointegration relations is defined by zero hypotheses. Once the existence of cointegration analysis is proved, the stability of this relationship is checked. If y_{t-1} coefficient is θ statistically important and negative, then cointegration relation is stable. It means that deviations from unbalanced situation and long−term

relations are temporary and it is getting corrected towards long term relations. θ is expected to be at -1 and 0 level.

3) If the existence of the cointegration relations is proved, we can assess long term period coefficients in the next step. That's why, we can apply Bewley (1979) transformation by equalizing long−term coefficients to 0 in equation 1 ($a_x + \theta y_{t-1} + \theta_{yx} x_{t-1} = 0$), and we can solve it in terms of y:

$$y_t = -\frac{a_x}{\theta} - \frac{\theta_{yx}}{\theta} x_t + \varepsilon_t \qquad (3)$$

4) In this phase, long−term white noise error (ECT_t) is calculated and inserted into the equation instead of long−term coefficients ($\theta y_{t-1} + \theta_{yx} x_{t-1}$). Subsequently, assessment is done and the stability of cointegration relations is checked again. The mathematical function of evaluating model is as the following:

$$\Delta Y_t = a_y + \sum_{i=1}^{n} \beta_{yi} \Delta Y_{t-i} + \sum_{j=0}^{n} \gamma_{yi} \Delta X_{t-J} + \mu ECT_{t-1} + \varepsilon_{yt} \qquad (4)$$

$$ECT_{t-1} = -\frac{a_x}{\theta} - \frac{\theta_{yx}}{\theta} x_t \qquad (5)$$

$$\Delta X_t = a_x + \sum_{i=1}^{n} \beta_{xi} \Delta X_{t-i} + \sum_{j=0}^{n} \gamma_{xi} \Delta Y_{t-J} + \mu ECT_{t-1} + \varepsilon_{xt} \qquad (6)$$

$$ECT_{t-1} = -\frac{a_y}{\theta} - \frac{\theta_{yx}}{\theta} y_t \qquad (7)$$

So, y_t or x_t is true value of dependent variable. ($-\frac{a_x}{\theta} - \frac{\theta_{yx}}{\theta} x_t$) is calculated value according to long−term equation (equation 1 and 2). In equation 4 and 6, if μ is between -1 and 0 and statistically important, then the cointegration realtions are constant. As mentioned above, deviation for short term period is inclined to be corrected towards long term relation. In case any serious calculation error is not noted, μ is getting close to θ coefficient in equation 1 and 2, sometimes gets equal value. So, the last phase is also considered as monitoring.

3.3. Engel−Granger (EG) cointegration test

Additionally, Engel−Granger (EG) cointegration test is used to check the cointegration relations among variables during econometric analysis. Beside the existence of long−term relations, it is possible to identify the direction of the relation among variables and research short−term relations (Nadirov & Aliyev, 2016). EG cointegration test consists of the following criteria (Gujarati & Porter, 2009; Enders, 2010). At the first phase, regression analysis for non−original stationary but the same−level differentiated stationary (I(1)) variables is assessed. So, for the case of two variables:

$$y_t = \alpha_0 + \alpha_1 x_t + \varepsilon_t \qquad (8)$$

Thus, α_0 and α_1 − regression coefficients, y and x − dependent and independent variables, ε − white noise error, t − time. Having assessed regsression analysis, the next phase is to check whether ε is white noise error. If ε_t is stationary, there will be cointegration relations among these variables. Accordingly, it will be considered as long−term equations. At the last phase, ECM is assessed by using delayed white noise error (ε_{t-1}) and converting cause−effect relations into stationary one.

$$\Delta Y_t = a_y + \sum_{i=1}^{n} \beta_{yi} \Delta Y_{t-i} + \sum_{j=0}^{n} \gamma_{yi} \Delta X_{t-J} + \mu ECT_{t-1} + \varepsilon_{yt} \qquad (9)$$

Thus, a_y, β_{yi}, γ_{yi} and μ coefficiants are mentioned. n is a optimum delayed measure and ε is a white noise error of the model. In order to identify optimum delayed measure, first we have to assess Vector Autoregressive (VAR) model among variables. Then, the equation 9 is assessed considering optimum delayed measure through the Least Square Method (LSM). Engle and Granger (1987) shows that if there is the existence of cointegration among variables, ECM assessment is a must. In case of having constant cointegration relations, Error Correction Term – ECT, thus ECT_{t-1} coefficient μ is negative and statistically important. Usually, this changes -1 and 0. If it is greater than -1, this correction process is going to be high. Using through equation 9, we can check cause−effect relations.

Granger cause−effect relation for a short term is assessed by using F−statistics and X square statistics value. This time, the statistical importance of all delay differential equation (all ΔX_{t-J}) for each variable (zero hypothesis: $H_0 : \gamma_{y1} = \gamma_{y2} = \cdots = \gamma_{yi} = 0, i = 1 \dots n$) is checked. Having zero hypothesis rejected, we can see that x has influence on y for a short term.

For a long term, Granger use t test to identify cause−effect relations and check the statistically importance of ECT_{t-1} coefficient. Therefore, zero hypothesis ($H_0 : \mu = 0$) is needed to be tested. If zero hypothesis is rejected at the end, ti will reveal that there is a long−term balance impact on it and it will normalize after a while.
Strong cause−effect relation serves to check the relations both in short− and long−term periods. In other words, through Wald test, F−statistics or X_i−square statistic value is checked as a zero hypothesis for each sample variable (zero hipothesis: $H_0 : \gamma_{y1} = \gamma_{y2} = \cdots = \gamma_{yi} = \mu = 0, i = 1 \dots n$).

3.4. Unit Root tests

It is essential to check the stationary of variables through Unit Root before the assessment of regression equations. Because, keeping stability between variables is important while assessing the dependency between two or more variables by using regression analysis. However, probability distribution for every time series in order to be stationary must be identical (Hasanov et al., 2019). Nevertheless, stationary of variables is not always desirable. For a long term or cointegration relation and assessment, the variables must be non−stationary in most methods. It is also required that the first difference should be stationary or I(1). It must be noted that if any time series variable is stationary with real values, then it can be considered I(0). If a variable is not I(0), then its first difference is calculated and its stationary is checked. In this case, if the variable is stationary, then it is considered I(1). A variable sometimes changes because of probability distribution. In that case, the variable becomes trend−stationary. One can refer to modern econometric books regarding the stationary of changes and its effect in time series analysis (Hill, Griffiths & Judge, 2001; Heij et. al., 2005; Asteriou & Hall, 2007). We can analyze them by applying three different unit root tests in order to get more reliable stationary test results: Augmented Dickey Fuller, Phillips−Perron (PP) and Kwiatkowski−Phillips− Schmidt−Shin (KPSS). The evaluation of these tests is done through E−Views 9. It must be noted that "unit root problem" or "variable is non−stationary" null hypothesis in unit root tests is checked. In KPSS test, "variable is stationary" hypothesis is taken and considered as stationary null hypothesis. If the variable is non−stationary without trend, and becomes stationary if trend is included, then the checked variable is considered "trend−stationary".

3.5. VAR Lag Order Selection Criteria

3.6. The Long Run Model

$$Y_t = \alpha + \sum_{i=1}^{n-1} \varphi_i \, \Delta Y_{t-i} + \sum_{i=0}^{m-1} \rho_i \, \Delta X_{t-i} + \mu_i \qquad (11)$$

3.7. Error Correction (short run) Model

$$\Delta Y_t = \alpha + \sum_{i=1}^{n-1} \varphi_i \Delta Y_{t-i} + \sum_{i=0}^{m-1} \rho_i \, \Delta X_{t-i} + \sigma ECT_{t-1} + \omega_i \qquad (12)$$

3.8. Diagnostic Test

This article will use Breusch Godfrey LM test (null hypothesis: "no serial correlation") in order to check subsequent correlation problem and use both Breusch−Pagan−Godfrey (null hypothesis: "no heteroskedasticity problem") and Autoregressive Conditional Hederoscedasticity test (ARCH) for obtaining more reliable outcomes for heteroskedasticity problem. During ARCH test, null hypothesis "no heteroskedasticity problem" theory is checked. Nonetheless, Ramsey RESET Test and Normality Test (Jarque–Bera) JB was checked. Null hypothesis rejection is acceptable for every five cases.

4. Results

4.1. Unit Root Test

Let's have a look at stationary of variables before identifying methods for evaluation. All stationary test results of variables for evaluation of both problems were given in the table. Each variable has been checked through three different unit root tests. The table shows that the majority of variables are I(1).

Thus, according to ADF test, in With Intercept only case, APHDS GFHDS are stationary. (I(0)). The rest of the variables are stationary I(1). In With Intercept & Trend case BSHEIT GSHEIT GFHDS and DDGS I(0) The rest of the variables are stationary I(1). In No Intercept & No Trend case, SHEIBMT I(2) is stationary again. The rest of the variables are stationary I(1) (A.Table 1).

In PP Unit Root Test, in With Intercept only case, APHDS I(0) are stationary. The rest of the variables are stationary I(1). In With Intercept & Trend case, BSHEIT GSHEIT and DDGS I(0) PHDS I(2) are stationary. The rest of the variables are stationary I(1). In No Intercept & No Trend case only BSHEIT I(2) is stationary. The rest of the variables are stationary I(I) (A.Table 2).

According to Kwiatkowski−Phillips−Schmidt−Shin test statistics most of the variables are I(0) (A.Table 3).

All these results are available for next assessment and methods. Reliant on the enumerated test results, variable are accepted as I(1). It means that all above−mentioned methods are applicable. As mentioned above, during application process of ARDL cointegration method, one of the important issues while establishing a model is to identify optimum lag length. At this time, the most important factor is to eliminate the subsequent correlation problem in selected optimum model and keep the minimum of SBC information criteria value.

4.2. VAR Lag Order Selection Criteria

In order to determine optimal lag for ARDL model, VAR Lag Order Selection Criteria was employed and we got the below−mentioned results.

Table 2. VAR Lag Order Selection Criteria

	Lag	AIC	SC
LSHEIBMT	1	−1.150803*	−0.852368*
LMSHEIT	1	2.678722*	2.977157*
LBSHEIT	1	1.574041*	1.872476*
LGSHEIT	1	1.241935*	1.540370*
LPHDS	1	3.159086*	3.457521*
LAPHDS	1	6.575382*	6.873817*
LGFHDS	1	4.134574*	4.433009*
LIDD	1	3.486674*	3.785109*
LSDDP	1	3.854404*	4.152839*
LADDP	1	5.304828*	5.603263*
LDDGS	1	5.720704*	6.019139*
	Note:		
*	Indicates lag order selected by the criterion		
AIC:	Akaike Information Criterion		
SC:	Schwarz Information Criterion		

According to Tabel 2, optimum lag period for all models is 1 (lag=1) based on 2 accepted information criteria (AIC and SC).

Table 3. Results from bound tests

Dependant variable	AIC lags	F−statistic	Significance								
			I0 Bound				I1 Bound				
			10%	5%	2.5%	1%	10%	5%	2.5%	1%	
LSHEIBMT	1	0.169691	4.04	4.94	5.77	6.84	4.78	5.73	6.68	7.84	No Cointegration
LMSHEIT	1	1.762728	4.04	4.94	5.77	6.84	4.78	5.73	6.68	7.84	No Cointegration
LBSHEIT	1	4.097428	4.04	4.94	5.77	6.84	4.78	5.73	6.68	7.84	Cointegration
LGSHEIT	1	5.695436	4.04	4.94	5.77	6.84	4.78	5.73	6.68	7.84	Cointegration
LPHDS	1	5.022410	4.04	4.94	5.77	6.84	4.78	5.73	6.68	7.84	Cointegration
LAPHDS	1	5.008170	4.04	4.94	5.77	6.84	4.78	5.73	6.68	7.84	Cointegration
LGFHDS	1	8.117594	4.04	4.94	5.77	6.84	4.78	5.73	6.68	7.84	Cointegration
LIDD	1	3.528603	4.04	4.94	5.77	6.84	4.78	5.73	6.68	7.84	No Cointegration
LSDDP	1	9.018878	4.04	4.94	5.77	6.84	4.78	5.73	6.68	7.84	Cointegration
LADDP	1	2.881023	4.04	4.94	5.77	6.84	4.78	5.73	6.68	7.84	No Cointegration
LDDGS	1	5.943413	4.04	4.94	5.77	6.84	4.78	5.73	6.68	7.84	Cointegration

Table 3 − reveals the cointegration relations among variables. Thus, there are the cointegration relations among state budget allocation for education (DDGS) and BSHEIT, GSHEIT, PHDS, APHDS, GFHDS, SDDP, DDGS. In other words, there is a long-term relations. Thus, based on the Narayan (2005) table, F−statistics is above 5% minimum indicator. However, there is no cointegration relation among state budget allocations for education and LSHEIBMT, MSHEIT, IDD, SDDP.

4.3. ARDL− Results for Long Run Model

Table 4. Long Run Coefficients

	Variable	Coefficient	Std. Error	t−Statistic	Prob.
LSHEIBMT	LBEES	0,027	0,030	0,911	0,379
	C	12,088***	1,574	7,681	0.0000
LMSHEIT	LBEES	0,018	0,053	0,347	0,734
	C	8,388***	1,233	6,806	0.0000
LBSHEIT	LBEES	0,037**	0,011	3,393	0,004
	C	9,653***	0,198	48,839	0.0000
LGSHEIT	LBEES	0,127	0,116	1,092	0,298
	C	7,498*	2,737	2,739	0,019
LPHDS	LBEES	0,052	0,026	1,976	0,076
	C	6,450***	0,487	13,240	0.0000
LAPHDS	LBEES	−0,003	0,098	− 0,033	0,974
	C	5,804**	1,798	3,228	0,005
LGFHDS	LBEES	0,035**	0,012	2,804	0,017
	C	5,192***	0,234	22,235	0.0000
LIDD	LBEES	0,179**	0,053	3,376	0,004
	C	0,509	0,917	0,555	0,586
LSDDP	LBEES	0,282***	0,045	6,259	0,000
	C	0,349	0,780	0,448	0,664
LADDP	LBEES	0,247*	0,114	2,174	0,043
	C	− 0,778	2,039	− 0,382	0,707
LDDGS	LBEES	0,136	0,065	2,091	0,051
	C	0,534	1,183	0,452	0,657

$$Cointeq = X_n - a * LBEES + c$$
$$n = LSHEIBMT; LMSHEIT; LBSHEIT; LGSHEIT; LPHDS;$$
$$LAPHDS; LGFHDS; LIDD; LSDDP; LADDP; LDDGS$$

Note: ***, ** and *indicate rejection of the null hypotheses at the 1%, 5% and 10% significance levels respectively

In Table 4, most of constants (model 1-9) in long run coefficients for all models are statistically significant. However, constant coefficient are statistically significant only in 5 models (model 3 and 10 (90%), model 7 and 8 (99%), model 10 (99%).

Table 5.

State budget allocation for science and education	The main indicators of education and science
State budget allocation for science and education (BEES) within a year increases 1%	SHEIBMT decreases by 0.027%
State budget allocation for science and education (BEES) within a year increases 1%	MSHEIT decreases by 0.018 %
State budget allocation for science and education (BEES) within a year increases 1%	BSHEIT decreases by 0.037%
State budget allocation for science and education (BEES) within a year increases 1%	GSHEIT decreases by 0.127%
State budget allocation for science and education (BEES) within a year increases 1%	PHDS decreases by 0.052 %
State budget allocation for science and education (BEES) within a year increases 1%	APHDS decreases by 0.003%
State budget allocation for science and education (BEES) within a year increases 1%	GFHDS decreases by 0.035 %
State budget allocation for science and education (BEES) within a year increases 1%	IDD decreases by 0.179 %
State budget allocation for science and education (BEES) within a year increases 1%	SDDP decreases by 0.282 %
State budget allocation for science and education	ADDP decreases by 0.247 %

(BEES) within a year increases 1%	
State budget allocation for science and education	DDGS decreases by 0.136 %
(BEES) within a year increases 1%	

The outcomes were explianed in Table 4 and 5. Thus, in case, expenses allocated by state budget for education increases *(*BEES*)* 1%, the number of students at the higher education institutions grows(SHEIBMT) 0.027%, the number of master students at the higher education institutions surges up (MSHEIT) 0.018%, the number of bachelor students at the higher education institutions rises (BSHEIT) 0.037%, the number of graduated students at the higher education institutions rockets (GSHEIT) 0.127%, the number of institutions for philosophy degree goes up (PHDS) 0.052%, the admission to philosophy degree program increases (APHDS) 0.003%, the number of philosophy degree graduate students surges up (GFHDS) 0.035%, the number of institutions for doctorate degree rises (IDD) 0.179%, the number of students on doctorate degree program rockets (SDDP) 0.282%, the admission to doctorate degree program goes up (ADDP) 0.247%, the number of graduated students on doctorate degree increases (DDGS) 0.136%.

4.4. ARDL model

Table 6. Coefficients ARDL model

	Coefficient					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Variable	ΔLSHEIBMT	ΔLMSHEIT	ΔLBSHEIT	ΔLGSHEIT	ΔLPHDS	ΔLAPHDS
ΔLSHEIBMT $_{(t-1)}$	0.16					
LSHEIBMT $_{(t-1)}$	−0.07					
ΔLMSHEIT $_{(t-1)}$		−0.76*				
LMSHEIT $_{(t-1)}$		0.16				
ΔLBSHEIT $_{(t-1)}$			−0.45*			
LBSHEIT $_{(t-1)}$			0.59*			
ΔLGSHEIT $_{(t-1)}$				−0.45**		
LGSHEIT $_{(t-1)}$				0.48		
ΔLPHDS $_{(t-1)}$					0.36	
LPHDS $_{(t-1)}$					0.09	
ΔLAPHDS $_{(t-1)}$						−0.48**
LAPHDS $_{(t-1)}$						0.96***
ΔLBEES $_{(t-1)}$	−0.007	−0.11*	−0.003	−0.02**	0.01	−0.09
LBEES $_{(t-1)}$	0.001	−0.02	−0.02	−0.02**	−0.004	−0.002
Constant	0.83	−0.86	−5.69*	−4.51**	−0.63	−5.42**

Note: ***, ** and *indicate rejection of the null hypotheses at the 1%, 5% and 10% significance levels respectively

Table 7. Coefficients ARDL model

	Coefficient				
	Model 7	Model 8	Model 9	Model 10	Model 11
Variable	ΔLGFHDS	ΔLIDD	ΔLSDDP	ΔLADDP	ΔLDDGS
ΔLGFHDS $_{(t-1)}$	−0.36				
LGFHDS $_{(t-1)}$	0.76**				
ΔLIDD $_{(t-1)}$		−0.33			
LIDD $_{(t-1)}$		0.18			
ΔLSDDP $_{(t-1)}$			0.20		
LSDDP $_{(t-1)}$			0.04		
ΔLADDP $_{(t-1)}$				−0.25	

$LADDP_{(t-1)}$				0.4	
$\Delta LDDGS_{(t-1)}$					−0.51**
$LDDGS_{(t-1)}$					0.92***
$\Delta LBEES_{(t-1)}$	0.02	−0.005	−0.02	0.06	0.21
$LBEES_{(t-1)}$	−0.03	−0.003	0.01	−0.05	−0.08
Constant	−3.96*	−0.50	−0.33	−0.34	−1.09

Note: ***, ** and *indicate rejection of the null hypotheses at the 1%, 5% and 10% significance levels respectively

ARDL model coefficients are 90-95% statistically significant only in models 2,3,4,5 and 11 (Table 6 and 7).

4.5. ARDL− Results Error Correction (short run) Model

Table 8. Error Correction (short run) Model Coefficients

	Coefficient					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Variable	ΔLSHEIBMT	ΔLMSHEIT	ΔLBSHEIT	ΔLGSHEIT	ΔLPHDS	ΔLAPHDS
$\Delta LSHEIBMT_{(t-1)}$	0.23					
$\Delta LMSHEIT_{(t-1)}$		−0.36				
$\Delta LBSHEIT_{(t-1)}$			−0.07			
$\Delta LGSHEIT_{(t-1)}$				−0.31		
$\Delta LPHDS_{(t-1)}$					0.71	
$\Delta LAPHDS_{(t-1)}$						0.31
$\Delta LBEES_{(t-1)}$	−0.003	−0.08	−0.03	−0.03	0.03	0.10
$ect_{(t-1)}$	−0.17*	−0.25	−0.52*	−0.05	−0.45*	−0.95**
Constant	0.02**	0.12*	0.03	0.05	−0.02	−0.05

Note: ***, ** and *indicate rejection of the null hypotheses at the 1%, 5% and 10% significance levels respectively

Table 9. Error Correction (short run) Model Coefficients

	Coefficient				
	Model 7	Model 8	Model 9	Model 10	Model 11
Variable	ΔlLGFHDS	ΔLIDD	ΔLSDDP	ΔLADDP	ΔLDDGS
$\Delta LGFHDS_{(t-1)}$	0.57**				
$\Delta LIDD_{(t-1)}$		−0.13			
$\Delta LSDDP_{(t-1)}$			0.39		
$\Delta LADDP_{(t-1)}$				0.10	
$\Delta LDDGS_{(t-1)}$					0.03
$\Delta LBEES_{(t-1)}$	0.02	−0.03	−0.02	−0.03	−0.02
$ect_{(t-1)}$	−0.81***	−0.31*	−0.17	−0.43*	−0.83
Constant	−0.01	0.09	0.06	0.08	0.10

Note: ***, ** and *indicate rejection of the null hypotheses at the 1%, 5% and 10% significance levels respectively

The resuls of short−term and ECM model have been illustrated. The results are: there is a negative relation among expenses allocated by state budget for education (BEES) the number of students at the higher education institutions (SHEIBMT) (model 1), the number of master students at the higher education institutions (MSHEIT) (model 2), the number of bachelor students at the higher education institutions (BSHEIT) (model 3), the number of graduated students at the higher education institutions (GSHEIT) (model 4), the number of institutions for doctorate degree (IDD) (model 8), the number of students on doctorate degree program (SDDP) (Model 9), the

admission to doctorate degree program (ADDP) (model 10) and the number of doctorate degree graduate students (DDGS) (model 11). However, there is a positive relation among budget expenses (education and science) (BEES), the number of Phd students (PHDS) (model 5), the number of graduated PhD. students (APHDS) (model 6) and the number of Phd graduate students (GFHDS) (model 7) (Table 8 and 9).

On the other hand, etc. coefficient is negative in all cases. According to models, the inclination towards the balance in a long−term is 17% (model 1), 25% (model 2), 52% (model 3), 5% (model4), 45% (model 5), 95% (model 6), 81% (model 7), 31% (model 8), 17% (model 9), 43% (model 10). 83% (model 11). In 2nd, 4th, 9th and 11th models, although ECM coefficient factors are not important, according to Pesaran and others (2001) they pave the way for having the cointegration relations because of negativity.

The weak and negative relations among the models prove that the main indicators of education and science don't depend on state budget allocations. There is a need to increase state budget allocations for science and education.

Table 10. Wald Test:

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Value	Prob.	Value	Prob.	Value	Prob.	Value	Prob.	Value	Prob.
F−statistic	4.01*	0.03	2.43	0.11	3.87*	0.05	0.68	0.51	4.99*	0.02
Chi−square	8.02*	0.01	4.86	0.0877	7.75*	0.02	1.37	0.50	9.99**	0.01

Note: ***, ** and *indicate rejection of the null hypotheses at the 1%, 5% and 10% significance levels respectively

Table 11. Wald Test:

	Model 6		Model 7		Model 8		Model 9		Model 10		Model 11	
	Value	Prob.	Value	Prob.	Value	Prob.	Value	Prob.	Value	Prob.	Value	Prob.
F−statistic	5.29*	0.01	7.19**	0.01	2.00	0.17	1.66	0.22	2.87	0.08	3.63*	0.05
Chi−square	10.59**	0.01	14.39***	0.001	4 01	0.13	3.33	0.18	5.75*	0.05	7.27*	0.02

Note: ***, ** and *indicate rejection of the null hypotheses at the 1%, 5% and 10% significance levels respectively

Wald Test results reveals that 1,3,5,6,7,10, and 11 models are 95% while model 7-I is 99% statistically significant (Table 10 and 11). So, "null" hypothesis is rejected and alternative hypothesis is accepted: there is cointegration relations among variables.

4.6. Diagnostic Test

Table 12. Diagnostic Test Results

		LM -Version				F -Version		
		RESET	JB	H.ARCHχ2	B−GSC LM χ2	H.ARCHχ2	B−GSC LM χ2	RESET Test
LSHEIBMT	Statistic	1.97	1,050	0,521	3,278	F(1,16)0.477	F(2,11)1.149	F (1, 12) 3,884
	Sig	0.072	0,592	0,471	0,194	0.499	0.352	0,072
LMSHEIT	Statistic	1.162	5,298	0,533	3,088	F(1,17)0.392	F(2,13)1.187	F (1, 14) 3,088
	Sig	0.265	0,071	0,465	0,214	0.492	0.336	0,214
LBSHEIT	Statistic	0,776	23,958	0,006	0,255	F(1,16)0.635	F(2,13)1.239	4,874
	Sig	0,975	0,000	0,940	0,614	0.351	0.336	0,042
LGSHEIT	Statistic	0.182	1,471	0,255	4,829	F(1,17)0.875	F(2,13)1.239	F (1, 10)0,033
	Sig	0.857	0,479	0,614	0,089	0.307	0.336	0,859
LPHDS	Statistic	0.583	1,418	0,035	6,157	F(1,15)0.031	F(2,8)2.077	F (1, 9) 0,341
	Sig	0.571	0,492	0,851	0,046	0.862	0.187	0,574
LAPHDS	Statistic	5.320	33,390	3,684	1,886	F(1,18)4.065	F(2,16)0.789	F (1,17)28,323
	Sig	0.0001	0,000	0,055	0,390	0.059	0.471	0,000
LGFHDS	Statistic	1.405	0,266	1,692	5,197	F(1,15)1.657	F(2,9)1.825	F (1, 10)1,976
	Sig	0.190	0,876	0,193	0,074	0.217	0.215	0,190
LIDD	Statistic	0.777	14,574	1,468	2,832	F (1,18)1.425	F(2,15)1.169	F (1, 16)0,604
	Sig	0.448	0,001	0,226	0,243	0.248	0.337	0,448
LSDDP	Statistic	0.661	0,337	2,386	13,319	F(1,15)2.449	F(2,8)11.380	F (1, 9) 0,436

	Sig	0.525	0,845	0,122	0,001	0.138	0.0046	0,525
LADDP	Statistic	1.377	22,044	0,671	2,507	F(1,18)0.625	F(2,16)1.083	F (1, 17) 1,903
	Sig	0.187	0,000	0,412	0,286	0.439	0.361	1,903
LDDGS	Statistic	0.287	1,111	0,509	0,717	F(1,18)0.469	F(2,160.292	F (1, 17) 0,082
	Sig	0.777	0,574	0,476	0,699	0.501	0.757	0,778
B−GSC LM χ2– Breusch-Godfrey Serial Correlation LM Test: χ2; RESET– Ramsey RESET Test; JB– Normality Test (Jarque−Bera); H.ARCH χ2 – Heteroskedasticity Test: ARCH χ2								

Some models for ARDL models (model 2,3,4,6 and model 11) are 5% 1% and 0.1% significant.

Regression equations are adequate. It also passes all the diagnostic tests against serial correlation (Durbin Watson test and Breusch−Godfrey test), heteroscedasticity (White Heteroskedasticity Test), and normality of errors (Jarque−Bera test). The Ramsey RESET test also suggests that the model is well specified. All the results of these tests are shown in Table 12. The stability of the long−run coefficient is tested by the short−run dynamics. Once the ECM model given by equations (Table 8 and 9) has been estimated, the cumulative sum of recursive residuals (CUSUM) and the CUSUM of square (CUSUMSQ) tests are applied to assess the parameter stability (Pesaran & Pesaran, 1997). A.Figure1 plot the results for CUSUM and CUSUMSQ tests. The results indicate the absence of any instability of the coefficients because the plot of the CUSUM and CUSUMSQ statistic fall inside the critical bands of the 5% confidence interval of parameter stability.

5. Discussion

As a result of used test outcomes and models, we can note the followings: According to Single Root Test results, only small part of used variable are I(0), however, most of them are I(1). We can mention this as a cointegration relations among variables. There is a weak cointegration relation among variables. There is slightly weak relations among the significant degrees of ARDL model coefficients and ARDL - Results Error Correction (short run) model coefficients. Obviously, all requirements for models are satisfied. So, long run coefficeint which was included to the model as a constant variable is negative in some models and statististically significant in others. Besides, ECT diagnostic test in all models provided a positive outcome. In other words, there is no correlation and heteroscedasticity problem in any of these models. Standard regression error is small. ECT has been distributed equally. There is no specification problem in models. Because, the rejection of zero hypothesis is high.

6. Conclusions

The significance of science and education is increasing in the development of the world countries in modern period. The policy referred to science and education was directed to the development and formation of the human capital. The financing of education and science is considered one of the priorities of social policy in the countries. In the recent century, the fast development and the improvement of the democratic management principles of the world economy indicates that the financing and formation of the education is very important process in all the governments.

In the earlier days of independence, Azerbaijan got dividends having exporting oil into the world market and this process helped to ignore the hard days in the country effective to 2003. The fantastic increase of oil prices of 2005 in the world markets caused to flow a lot amount of money into Azerbaijan economy. Although the biggest part of allocations was invested on infrastructure, some other social sectors were also benefited from it.

The financing of education and science is divided into three parts for its sources. These are classified for state, private, international and mixed. State expenditures are priority that's why state sector is being financed a lot.

Thus, citizens are benefited and get free education. Nonetheless, the biggest part of the expenditures are spent on infrastructure, that's why salary and education quality is still lacking to meet modern standards.

Recently, the significant part of the expenditure has been directed to infrastructure. So, the expenditures has been increased 5 times in the last 13 years, however investment on education has grown up 60 times. Educators' salary has been surged up 5 times. By the way, there is a tendency that the volume of the educator's salary is less than other sectors. This case may cause the poor quality of education.

Obviously, there is a huge demand to meet European standards of education quality and conduct comprehensive actions. For this purpose, it is very important to strengthen management style of education and increase teacher's reputation in the society.

With a view to solve the mentioned problems, a comprehensive action plan must be designed to create a competitive education system and contemporary infrastructure.

The current situation related to the financing of science and education in Azerbaijan was defined as the main direction. The implemented research is as the following:
- If the state expenditures for education and science were to increase, relative reduction would be observed in other fields;
- It would be better find alternative ways in the finance of education and science in order to prepare specialists who meet the world standards and play an important role in sustainable development;
- It must be seriously taken to have a weak relationship between the expenditures of education and science and the main indicators of science.
- It is important to make the state budget increase in order to obtain optimum dependency between the state expenditures on education and science and the main indicators of them;
- The expenditures on education and science must be concrete and significant;
- The financing of higher education, especially master and doctorate degree education must be priority.

There is a problem to provide the balance between the quality of education and science and the expenditure of them. Because the research shows that there is no any significant improvement although a lot of investment was allocated. That's why, establishing a new and diversified financing mechanism is a must.

7. Limitations and future research orientations

During research, it was revealed that although the bduget allocation for education was high in the last 10-15 years, this tendency was not the same as economic growth and as a result of it, education expenses decreased in GDP. On the other hand, the special weight of the expenses allocated for education and science declined in general budget expenditures. However, expenditures related to science and education surged up in spite of the reductions. Investment for science and education rockets as well. But having inaccurate statistical data and its absence for a long term made some difficulties to choose some econometric models, to evaluate variables, to conduct tests and etc.
- We can mention some of the future research directions as the following:
- Private and international financing of science and education
- Economic analysis of salary expenditures in state allocation for science and education
- Investment and infrastructure expenditure analysis in state allocations for education and science.
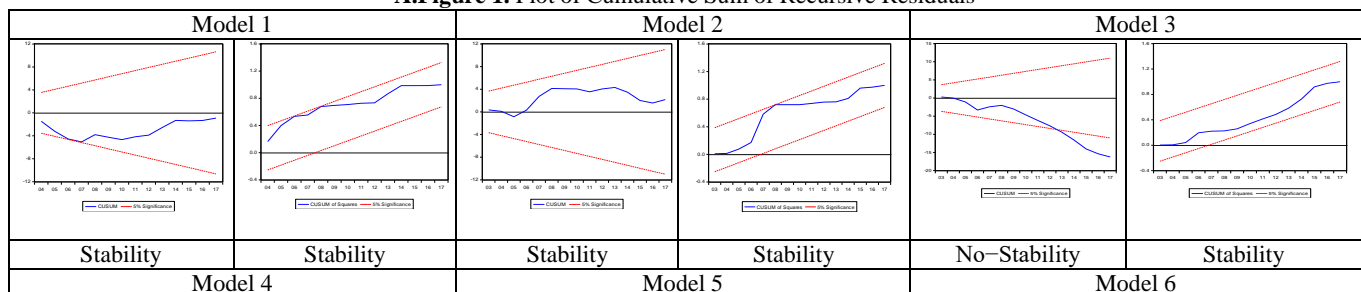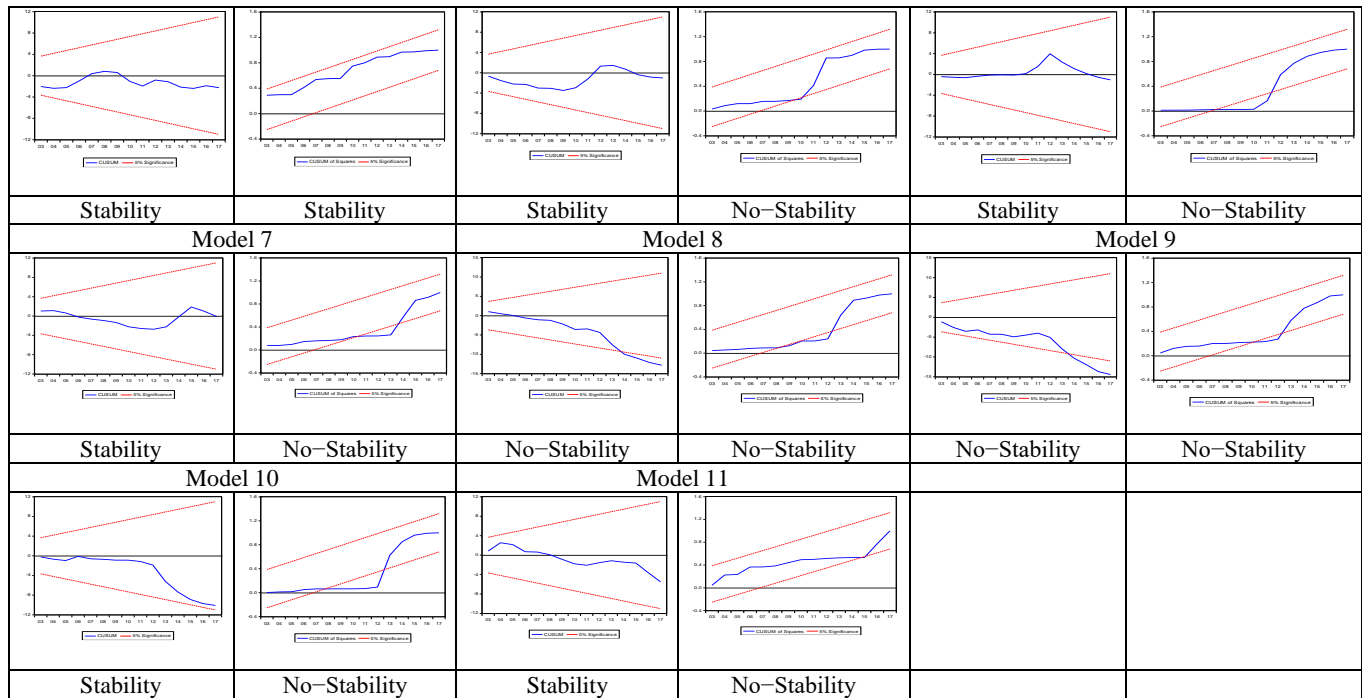
Appendix

A. Table 1. ADF Unit Root Test.

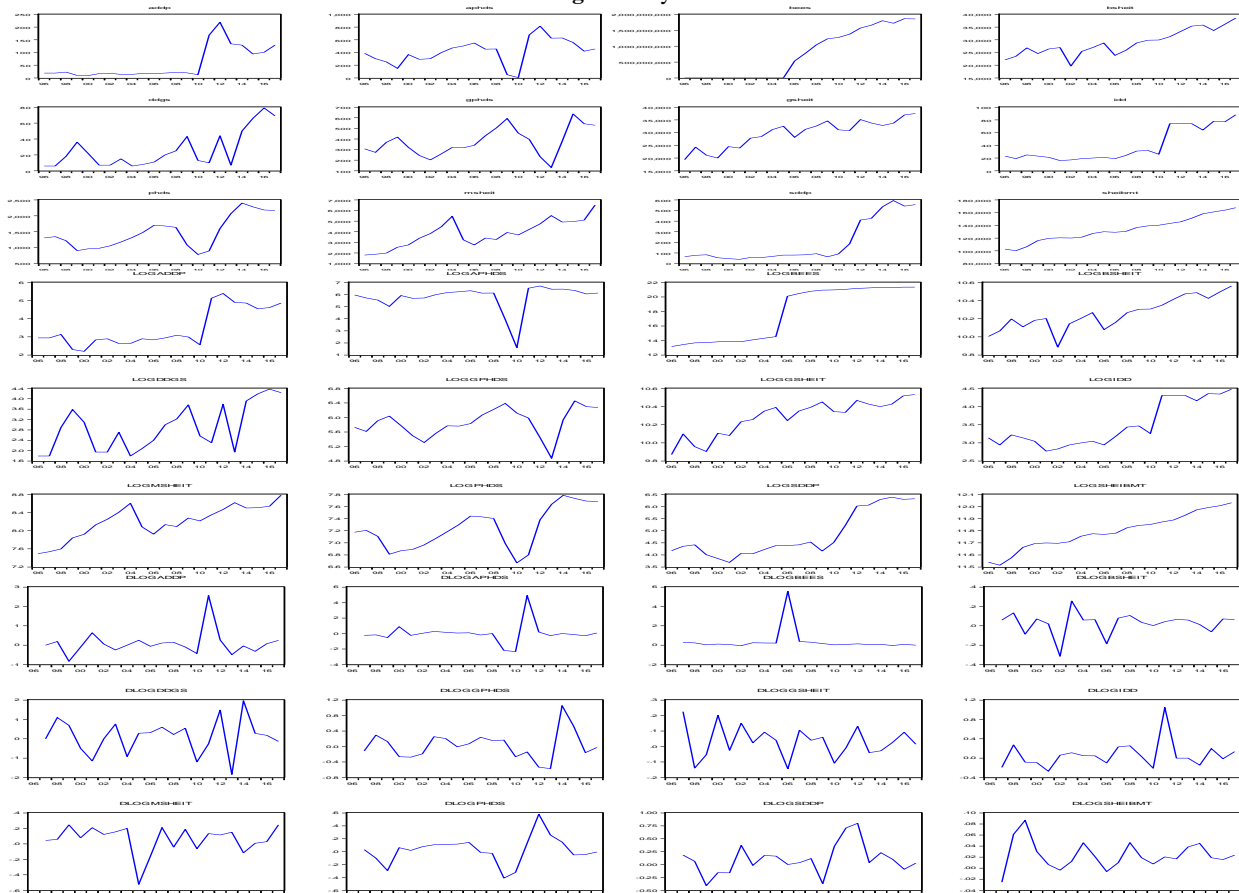|		ADF−Stat	İntegrir İ(0,1,2)	P−P test statistic	İntegrir İ(0,1,2)	KPSS test statistic	İntegrir İ(0,1,2)
		At Level Form					
	LSHEIBMT	−0.19	I(1)	−0.50	I(1)	0.66**	I(0)
	LMSHEIT	−1.47	I(1)	−1.42	I(1)	0.55**	I(0)
	LBSHEIT	−1.41	I(1)	−1.12	I(1)	0.62**	I(0)
	LGSHEIT	−1.90	I(1)	−1.99	I(1)	0.61**	I(0)
	LPHDS	−2.57	I(1)	−1.47	I(1)	0.35*	I(0)
	LAPHDS	−3.25**	I(0)	−3.12**	I(0)	0.09	
	LGFHDS	−3.37**	I(0)	−2.33	I(1)	0.20	
	LIDD	−0.39	I(1)	−0.01	I(1)	0.55**	I(0)
	LSDDP	−0.10	I(1)	−0.10	I(1)	0.52**	I(0)
	LADDP	−1.13	I(1)	−0.97	I(1)	0.51**	I(0)
	LDDGS	−2.55	I(1)	−2.55	I(1)	0.52**	I(0)
	LBEES	−0.95	I(1)	−0.92	I(1)	0.58**	I(0)
		At First differencing					
	D(LSHEIBMT)	−6.53***	I(0)	−4.18***	I(0)	0.30	
	D(LMSHEIT)	−4.16***	I(0)	−4.16***	I(0)	0.09	
	D(LBSHEIT)	−6.17***	I(0)	−13.09***	I(0)	0.50**	I(0)
	D(LGSHEIT)	−6.84***	I(0)	−7.77***	I(0)	0.42*	I(0)
	D(LPHDS)	−3.45**	I(0)	−2.71*	I(0)	0.09	
	D(LAPHDS)	−5.02***	I(0)	−10.43***	I(0)	0.06	
	D(LGFHDS)	−4.16***	I(0)	−4.06***	I(0)	0.12	
	D(LIDD)	−5.55***	I(0)	−5.77***	I(0)	0.25	
	D(LSDDP)	−3.10**	I(0)	−3.10**	I(0)	0.20	
	D(LADDP)	−4.65***	I(0)	−5.32***	I(0)	0.25	
	D(LDDGS)	−6.35***	I(0)	−7.88***	I(0)	0.25	
	D(LBEES)	−4.17***	I(0)	−4.17***	I(0)	0.11	
		At Level Form					
	LSHEIBMT	4.87	I(1)	−2.12	I(1)	0.09	
	LMSHEIT	−2.25	I(1)	−1.60	I(1)	0.09	
	LBSHEIT	−3.61*	I(0)	−3.57*	I(0)	0.15	
	LGSHEIT	−3.34*	I(0)	−3.37*	I(0)	0.17	
	LPHDS	−4.20**	I(0)	−2.18	I(1)	0.08	
	LAPHDS	−3.19	I(1)	−3.09	I(1)	0.06	
	LGFHDS	−3.53*	I(0)	−2.48	I(1)	0.06	
	LIDD	−2.34	I(1)	−2.26	I(1)	0.15	
	LSDDP	−2.48	I(1)	−1.64	I(1)	0.15	
With Intercept & Trend	LADDP	−2.56	I(1)	−2.41	I(1)	0.12	
	LDDGS	−3.42*	I(0)	−3.42*	I(0)	0.10	
	LBEES	−1.59	I(1)	−1.70	I(1)	0.09	
		At First differencing					
	D(LSHEIBMT)	−6.21***	I(0)	−4.17**	I(0)	0.38***	I(0)
	D(LMSHEIT)	−4.05**	I(0)	−4.02**	I(0)	0.08	
	D(LBSHEIT)	−3.80**	I(0)	−15.38***	I(0)	0.50***	I(0)
	D(LGSHEIT)	−6.60***	I(0)	−7.53***	I(0)	0.30***	I(0)
	D(D(LPHDS))			−2.70	I(2)		
	D(LPHDS)	−3.41*	I(0)	−3.76*	I(0)	0.07	
	D(LAPHDS)	−4.88***	I(0)	−10.19***	I(0)	0.50***	I(0)
	D(LGFHDS)	−4.16**	I(0)	−4.02**	I(0)	0.15**	I(0)
	D(LIDD)	−5.55***	I(0)	−6.30***	I(0)	0.18**	I(0)

	D(LSDDP)	−3.26*	I(0)	−3.26*	I(0)	0.09	
	D(LADDP)	−4.57***	I(0)	−6.12***	I(0)	0.39***	I(0)
	D(LDDGS)	−6.17***	I(0)	−8.54***	I(0)	0.25***	I(0)
	D(LBEES)	−4.17***	I(0)	−4.08**	I(0)	0.10	
No Intercept & No Trend	At Level Form						
	LSHEIBMT	1.25	I(1)	10.05	I(1)		
	LMSHEIT	1.52	I(1)	−2.31	I(1)		
	LBSHEIT	1.02	I(1)	4.17***	I(0)		
	LGSHEIT	1.38	I(1)	3.38	I(1)		
	LPHDS	0.59	I(1)	0.37	I(1)		
	LAPHDS	0.48	I(1)	−0.18	I(1)		
	LGFHDS	0.20	I(1)	0.43	I(1)		
	LIDD	0.99	I(1)	1.41	I(1)		
	LSDDP	1.57	I(1)	1.36	I(1)		
	LADDP	0.30	I(1)	0.89	I(1)		
	LDDGS	0.42	I(1)	0.81	I(1)		
	LBEES	1.25	I(1)	1.25	I(1)		
	At First differencing						
	D(LSHEIBMT)	−0.77	I(2)	−2.32**	I(0)		
	D(D(LSHEIBMT)	−6.15***	I(0)				
	D(LMSHEIT)	−3.80***	I(0)	−3.81***	I(0)		
	D(LBSHEIT)	−5.92***	I(0)	−6.10***	I(0)		
	D(LGSHEIT)	−6.43***	I(0)	−6.37***	I(0)		
	D(LPHDS)	−3.47***	I(0)	−2.75***	I(0)		
	D(LAPHDS)	−5.17***	I(0)	−10.71***	I(0)		
	D(LGFHDS)	−4.26***	I(0)	−4.12***	I(0)		
	D(LIDD)	−5.20***	I(0)	−5.20***	I(0)		
	D(LSDDP)	−2.96***	I(0)	−2.97***	I(0)		
	D(LADDP)	−4.67***	I(0)	−4.85***	I(0)		
	D(LDDGS)	−6.33***	I(0)	−7.02***	I(0)		
	D(LBEES)	−3.89***	I(0)	−3.88***	I(0)		

Note: ADF denotes the Augmented Dickey−Fuller single root system respectively. The maximum lag order is 2. The optimum lag order is selected based on the Shwarz criterion automatically; PP Phillips–Perron is single root system. The optimum lag order in PP test is selected based on the Newey–West criterion automatically; KPSS denotes Kwiatkowski-Phillips-Schmidt-Shin (Kwiatkowski *et al*., 1992) single root system. The optimum lag order in KPSS test is selected based on the Newey-West criterion automatically; The critical values are taken from Kwiatkowski-Phillips-Schmidt-Shin. ***, ** and *indicate rejection of the null hypotheses at the 1%, 5% and 10% significance levels respectively. The critical values are taken from MacKinnon (1996). Assessment period: 1996−2017.

A.Figure 1. Plot of Cumulative Sum of Recursive Residuals

Model 1		Model 2		Model 3	
Stability	Stability	Stability	Stability	No−Stability	Stability
Model 4		Model 5		Model 6	

A. Figure2. Dynamic

A. Table 4. ADF unit root test (**At Level Form**)

	Variable	$M1_{ECT}$	$M2_{ECT}$	$M3_{ECT}$	$M4_{ECT}$	$M5_{ECT}$	$M6_{ECT}$	$M7_{ECT}$	$M8_{ECT}$	$M9_{ECT}$	$M10_{ECT}$	$M11_{ECT}$
With Intercept only	ADF−Stat	−1.70	−1.85	−2.97*	−3.20**	−3.42**	−3.25**	−3.80***	−1.77	−1.03	−2.12	−3.30 **
	Stationarity	N/ S	N/ S	S	S	S	S	S	N/ S	N/ S	N/ S	S
With Intercept & Trend	ADF−Stat	−1.65	−1.69	−3.07	−3.12	−3.48*	−3.20	−3.71**	−1.99	−1.30	−2.25	−3.22
	Stationarity	N/ S	N/ S	N/ S	N/ S	S	N/ S	S	N/ S	N/ S	N/ S	N/ S
No Intercept & No Trend	ADF−Stat	−1.75*	−1.83*	−3.06***	−3.30 ***	−3.51***	−3.32***	−3.92***	−1.85*	−1.08	−2.18**	−3.39***
	Stationarity	S	S	S	S	S	S	S	S	N/ S	S	S

Note: ADF denotes the Augmented Dickey–Fuller single root system respectively. The maximum lag order is 2. The optimum lag order is selected based on the Shwarz criterion automatically; ***, ** and *indicate rejection of the null hypotheses at the 1%, 5% and 10% significance levels respectively. The critical values are taken from MacKinnon (1996). Legend: S–Stationarity; N/S–No Stationarity

A.Table 5. Diagnostic Test Results

		LM -Version				F -Version		
		RESET	JB	H.ARCHχ2	B−GSC LM χ2	H.ARCHχ2	B−GSC LM χ2	RESET Test
LSHEIBMT	Statistic	2.123	1.080	1.338	7.314	F(1,16)0.477	F(2,11)1.149	(1,14) 4.509
	Sig	0.052	0.582	0.247	0.025	0.499	0.352	0.052
LMSHEIT	Statistic	2.990	1.119	2.731	0.029	F(1,17) 0.288	F(2,13) 3.748	(1, 14) 8.942
	Sig	0.009	0.571	0.098	0.985	0.2721	0.051	0.009
LBSHEIT	Statistic	0.557	10.275	0.146	2.028	F(1,17)2.854	F(2,13)0.009	(1, 14)0.311
	Sig	0.586	0.005	0.702	0.362	0.1094	0.9903	0.586
LGSHEIT	Statistic	0.830	1.552	1.917	2.230	F(1,17) 0.131	F(2,13)0.733	(1, 14)0.689
	Sig	0.420	0.460	0.166	0.327	0.7211	0.4991	0.420
LPHDS	Statistic	0.017	2.108	0.008	0.416	F(1,17)1.908	F(2,13) 0.815	(1, 14)0.000
	Sig	0.985	0.348	0.928	0.811	0.185	0.463	0.9859
LAPHDS	Statistic	5.851	18.562	3.359	1.031	F(1,17)0.007	F(2,13)0.138	(1, 14)34.237
	Sig	0.000	0.000	0.066	0.597	0.933	0.872	0.000
LGFHDS	Statistic	1.751	2.126	5.403	6.065	F(1,17)3.651	F(2,13) 0.353	(1, 14) 3.065
	Sig	0.102	0.345	0.020	0.048	0.073	0.708	0.101
LIDD	Statistic	2.769	4.122	3.964	4.690	F(1,17) 0.756	F(2,13)2.829	(1, 14)7.667
	Sig	0.015	0.127	0.047	0.095	0.018	0.095	0.015
LSDDP	Statistic	0.634	3.022	0.202	1.770	F(1,17) 0.482	F(2,13)1.991	(1, 14)0.402
	Sig	0.536	0.220	0.652	0.412	0.049	0.176	0.5361
LADDP	Statistic	0.775	1.462	2.878	4.098	F(1,17)0.183	F(2,13)0.631	F(1,14)0.601
	Sig	0.451	0.481	0.089	0.128	0.674	0.547	0.4510
LDDGS	Statistic	2.237	3.022	0.014	1.292	F(1,17)0.034	F(2,13) 1.675	F(1,14)5.007
	Sig	0.042	0.220	0.905	0.523	0.0996	0.2252	0.0420

A. Abbreviations

SHEIBMT	The number of students at the higher education institutions – total, person
MSHEIT	The number of master students at the higher education institutions (admission) − total, person
BSHEIT	The number of bachelor students at the higher education institutions (admission) − total, person
GSHEIT	The number of graduated students at the higher education institutions − total, person
PhDS	The number of Phd students − person
APhDS	Admission to Phd programs − person
GPhDS	The number of graduated Phd students, person
IDD	The number of institutions for doctorate degree
SDDP	The number of students on doctorate degree program – person
ADDP	The admission to doctorate degree program – person
DDGS	The number of doctorate degree graduate students − person
BEES	Budget expenses (education and science) −mln.manat

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