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FOREWORD. Vladimir Menshikov

**Vera Komarova, Jelena Lonska, Olga Lavrinenko,
Vladimir Menshikov**

**INFLUENCE OF EXISTING SOCIAL AND ECONOMIC INTERACTIONS ON SUSTAINABLE
TERRITORY DEVELOPMENT: THE CASE OF ICELAND 412**

Martina Iorio, Salvatore Monni, Barbara Brollo

THE BRAZILIAN AMAZON: A RESOURCE CURSE OR RENEWED COLONIALISM? 438

Dana Benešová, Viera Kubičková, Anna Micháľková, Monika Krošlákova

**INNOVATION ACTIVITIES OF GAZELLES IN BUSINESS SERVICES AS A FACTOR OF
SUSTAINABLE GROWTH IN THE SLOVAK REPUBLIC 452**

Alena V. Fomina, Oksana N. Berduygina, Alexander A. Shatsky

**INDUSTRIAL COOPERATION AND ITS INFLUENCE ON SUSTAINABLE
ECONOMIC GROWTH 467**

Angelina Rosha, Natalja Lace

**RELEVANCE ANALYSIS OF FACTORS ENHANCING COACHING INTERACTIONS IN
ORGANIZATIONS 480**

Jozef Kuril

**PUBLIC ADMINISTRATION FOR SAFE AND SECURE ENVIRONMENT:
CASE OF SLOVAK REPUBLIC 493**

**Mira A. Kantemirova, Zaur L. Dzakoev, Zara R. Alikova, Sergei R. Chedgemov,
Zarina V. Soskiewa**

**PERCOLATION APPROACH TO SIMULATION OF A SUSTAINABLE
NETWORK ECONOMY STRUCTURE 502**

Awais Ahmed, Abdullah Ejaz, Rizwan Ali, Ishfaq Ahmad

**SECTORAL INTEGRATION AND INVESTMENT DIVERSIFICATION
OPPORTUNITIES: EVIDENCE FROM COLOMBO STOCK EXCHANGE 514**

Tadas Limba, Aurimas Šidlauskas

**SECURE PERSONAL DATA ADMINISTRATION IN THE SOCIAL NETWORKS:
THE CASE OF VOLUNTARY SHARING OF PERSONAL DATA ON THE FACEBOOK 528**

Jurgita Raudeliūnienė, Vida Davidavičienė, Artūras Jakubavičius

KNOWLEDGE MANAGEMENT PROCESS MODEL 542

Larisa Shakhovskaya , Elena Petrenko ,Alexandr Dzhindzholia , Victoria Timonina MARKET PECULIARITIES OF NATURAL GASS: CASE OF THE PACIFIC REGION	555
Bogdan Włodarczyk, Marek Szturo, George H. Ionescu, Daniela Firoiu, Ramona Pirvu, Roxana Badircea THE IMPACT OF CREDIT AVAILABILITY ON SMALL AND MEDIUM COMPANIES	565
Dana Kiseľáková, Beáta Šofranková, Veronika Čabinová, Erika Onuferová COMPETITIVENESS AND SUSTAINABLE GROWTH ANALYSIS OF THE EU COUNTRIES WITH THE USE OF GLOBAL INDEXES' METHODOLOGY	581
Mohammad Naushad STUDY ON OF ENTREPRENEURIAL INTENTIONS: CASE OF SAUDI STUDENTS	600
Tadas Limba, Mindaugas Kiškis, Gintarė Gulevičiūtė, Andrius Stasiukynas, Tomas Plėta, Ieva Juozapavičiūtė MODEL BASED ON QUALITATIVE CRITERIA FOR INTERNET MARKETING DEVELOPMENT	618
Margarita Marija Lietuvnikė, Aidas Vasilis Vasiliauskas, Virgilija Vasilienė-Vasiliauskienė, Jolanta Sabaitytė PECULIARITIES OF ILLEGAL IMMIGRANT'S INTRUSIONS INTO ROAD FREIGHT TRANSPORT UNITS IN THE FRANCE - UK CORRIDOR	634
Sulphey, M M, Nasser Saad AlKahtani, Abdul Malik Syed RELATIONSHIP BETWEEN ADMISSION GRADES AND ACADEMIC ACHIEVEMENT	648
Nadežda Jankelová, Andrea Jankurová, Martina Beňová, Zuzana Skorková SECURITY OF THE BUSINESS ORGANIZATIONS AS A RESULT OF THE ECONOMIC CRISIS	659
Mikhail Yakovlevich Veselovsky, Tatiana Vitalievna Pogodina, Raisa Vasilyevna Ilyukhina, Tatyana Anatolyevna Sigunova, Nina Fedorovna Kuzovleva FINANCIAL AND ECONOMIC MECHANISMS OF PROMOTING INNOVATIVE ACTIVITY IN THE CONTEXT OF THE DIGITAL ECONOMY FORMATION	672
Syed Ali Abbas ENTREPRENEURSHIP AND INFORMATION TECHNOLOGY BUSINESSES IN ECONOMIC CRISIS	682
Krzysztof Stepaniuk VISUALIZATION OF EXPRESSING CULINARY EXPERIENCE IN SOCIAL NETWORK, MEMETIC APPROACH	693



Dear readers,

Entrepreneurship of youth, entrepreneurship middle age people, men and women, entrepreneurship of retired people is equally valuable for living with dignity and satisfaction.

Sustainable development of regions, countries, and cities cannot be possible without entrepreneurial efforts of separate people and societies. Center of Social Research at Daugavpils University cooperates closely with Entrepreneurship and Sustainability Center, non-profit organization, publisher of this journal. I am glad that the journal became an international platform for sharing scientific findings and entrepreneurial practices, became a hub of cooperation and collaboration between academia, industry, society.

I want to wish the readers, contributors and society to immerse themselves into the newest, 2018 March issue, of Entrepreneurship and Sustainability Issues, and enjoy reading. Let us all contribute to our wellbeing, longevity, and sustainable development of our enterprises and societies!

With kind regards

A handwritten signature in blue ink, consisting of stylized, flowing letters that appear to read 'V. Menshikov'.

Dr. sc. soc. VLADIMIR MENSHIKOV

*Professor, Head of the Centre of Social Research at
Daugavpils University
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INFLUENCE OF EXISTING SOCIAL AND ECONOMIC INTERACTIONS ON SUSTAINABLE TERRITORY DEVELOPMENT: THE CASE OF ICELAND*

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Abstract. Iceland was identified as a typical country with relatively high achieved competitiveness level and at the same time negative growth capacity – so, with eroded sustainability of territory development. As a research hypothesis the authors suggest that Iceland's social and economic interactions with other “worlds-economies” are not diversified enough. The analysis of export/import and international migration flows of Iceland shows that a market-capitalist “world-economy” is an absolute leader (80-90 %) for Icelandic international trade and migration. Analysis of air logistical interconnections shows that a kind of sub-“world-economy” is formed which can be referred to as a Northern-Atlantic one. As results of regression analysis show social and economic interactions with the representatives of its own “world-

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economy” mainly draw Iceland’s sustainable territory development in their direction, and, as the trends of their development are negative or stagnate (USA and Spain), Iceland’s trend of sustainable territory development is also drawn after them. In its turn, rather infrequent social and economic interactions with other “worlds-economies” either do not influence significantly Iceland’s sustainable territory development (as interactions with Brazil do) or influence in the opposite way (as interactions with China do). Therefore, the practical efficiency of recommendation of Human Development Report 2013 to interact more actively with other “worlds-economies” is not so far proved in social and economic reality – at least, in the case with Iceland as a typical highly-developed capitalist country.

Keywords: sustainable territory development, spatial economics, social and economic interactions, Iceland, “worlds-economies”

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JEL Classifications: O11, O18, R58

1. Introduction

The authors have chosen Iceland for the research of sustainable development of its territory and the role of social and economic interactions in this process. Why Iceland? Within the research project “Rethinking Territory Development in Global Comparative Researches (Rethink Development)” (2014-2016) managed by one of the authors, which was realized at the Faculty of Economics of the University of Rijeka (Croatia), Iceland was identified as a country with a relatively high achieved level of sustainable territory development (empirically measured by the Global Competitiveness Index (GCI) created by the World Economic Forum), and at the same time negative growth capacity, i.e. a trend of relatively fast declining of its level of sustainable territory development.

The average annual change of the GCI of Iceland for the period 2005-2014 is -0.06 points on the scale from 1 to 7, and this decline is one of the highest in the world. According to the data of the Global Competitiveness Reports published by the World Economic Forum, in 2005 Iceland had 5.34 points of the GCI on the scale from 1 to 7 (Lopez-Claros et al., 2005), in 2006 – 5.40 points (Lopez-Claros, 2006), in 2007 – 5.02 points (Lopez-Claros and Schwab, 2007), in 2008 – 5.05 points (Schwab, 2008), in 2009 – 4.80 points (Schwab, 2009), in 2010 – 4.68 points (Schwab, 2010), in 2011 – 4.75 points (Schwab, 2011), in 2012 – 4.74 points (Schwab, 2012), in 2013 – 4.66 points (Schwab, 2013), in 2014 – 4.71 points (Schwab, 2014), in 2015 – 4.83 points (Schwab, 2015) (see Figure 1).

This general trend of dramatic decrease level of sustainable territory development of a highly-developed country generates a certain interest and requires explanations by means of searching for and analyzing those factors which promote this kind of recession in sustainable territory development or – vice versa– accelerate it. Within the framework of this research, the emphasis will be put on the role of social and economic interactions in sustainable territory development of Iceland. Why this kind of emphasis? Because the present research will be carried out within the theoretical framework of classical spatial economics, which suggests that the state of sustainable territory development of a country depends not only on its own capacity but also on development of territories which are included in social and economic interactions of this country (within the framework of another approach of the spatial economics – depends on development of territories, which are located around the analyzed country) (Kuenne, 1963; Takayama and Judge, 1964; Anselin, 1988, 2003; LeSage, 1999; Fotheringham et al., 2000; LeSage and Pace, 2009; Elhorst, 2014; Tvaronavičienė, 2018).

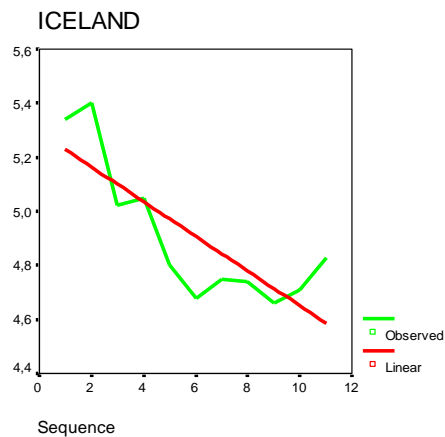


Fig.1. Growth line of Iceland created by the regressive curve estimation method, the Global Competitiveness Index, 2005-2015

Source: elaborated by the authors using SPSS software on the basis of Lopez-Claros et al., 2005; Lopez-Claros, 2006; Lopez-Claros, Schwab, 2007; Schwab, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015

The research problem, which is being solved by the authors within the framework of this article, can be defined in the following way: we do not know whether the social and economic interactions which Iceland has promote its sustainable territory development (in the center of which is well-being of the people residing in the territory) or they restrain this development, i.e. what the role of Iceland's social and economic interactions in its sustainable territory development is. It is necessary to know it, so in case of identifying the significance of these interactions to effectively manage them, developing the ones which promote Iceland's sustainable territory development, and limiting the ones which restrain this.

Following the Human Development Report 2013 which argues that “the South needs the North, and increasingly the North needs the South” (UNDP, 2013) it could be suggested that one of the best sources of sustainable development for every territory is interconnection with other parts of the world (Azamatova et al., 2017). Within this research above-mentioned “other parts of the world” methodologically have been defined as “worlds-economies”. F. Braudel defines three characteristics of a “world-economy”: (1) a “world-economy” covers definite geographic space with natural, economic, cultural or mental borders; (2) a “world-economy” has a center – particular country; this center is not stable in a long-term period; (3) a “world-economy” has horizontal (spatial) and vertical (social) hierarchy (Braudel, 1967).

As a research hypothesis the authors suggest that Iceland's social and economic interactions possess a certain peculiarity – looking at the interconnection of this state with other “worlds-economies” – which can, at least, partially explain a dramatic decrease in the level of competitiveness in the highly-developed Iceland which was observed in the 2000s. Based on the above-mentioned methodological approach of the spatial economics it is possible to anticipate that challenges of Iceland's sustainable territory development are greatly determined by the fact that Iceland's social and economic interactions are not diversified enough between “worlds-economies” currently existed in the global economic space.

The remainder of the paper is organized as follows: Section 2 provides literature review on sustainable territory development of Iceland within the context of modern “worlds-economies”, Section 3 outlines research methodology followed by a description of the empirical data and analysis in Section 4, Section 5 presents the results and discussion, and, finally, Section 6 offers conclusions.

2. Literature review on sustainable territory development of Iceland within the context of modern “worlds-economies”

In modern scientific literature, the most frequent is the indication on two “worlds-economies” dominant in the global space: the first one with the center in the United Kingdom-the USA[†], the second one – with the center in China (Zoega, 2013; Kiva, 2014; Efremenko and Meleshkina, 2014; Delyagin, 2015; Cihelkova et al., 2017), i.e. provisionally the North and the South if we use the concepts provided by the Human Development Report 2013. Possibly, Iceland’s social and economic interactions will also, especially in recent years, gravitate toward either the North or the South. However, as in scientific literature there are also other definitions of smaller “worlds-economies”, for example, Atlantic economy (Barry, 2014), Tiger economy (Kirkby, 2012) etc., the authors suggest their own empirical interpretation of modern “worlds-economies” (Boronenko et al., 2015; Boronenko and Lavrinenko, 2016).

In their previous publications the authors have chosen two key indicators as a methodological basis for identification and empirical interpretation of modern “worlds-economies”: *the use of natural resources* (within the framework of this research – use of energy), and *the quality of social infrastructure*. Why exactly these indicators? First of all, the challenging and recognized by the world scientific community limitation of natural resources which are not enough to provide comfort for all world population (to provide them not for everybody is inhuman and this is a permanent reason for conflicts and remodeling of the world) is a natural bound for the further increase in production and consumption, i.e. economic growth according to consumption-driven capitalist economy (Meadows et al., 1972, 2004; Lahart et al., 2008; Global Footprint Network and Mediterranean Ecological Footprint Initiative, 2016). Moreover, “the resource constraints foreseen by the Club of Rome are more evident today than at any time since the 1972 publication of the think tank’s famous book, “The Limits of Growth” (Lahart et al., 2008). The classical option (in according to this limitation) offered by the Club of Rome is to encourage social and economic patterns that would satisfy the needs of people under the minimal use of natural resources (Meadows et al., 1972). Later some researchers argued that “recent economic research shows that the physical limits to natural resource supply do not cause any serious effects on economic growth. This is because growth depends more strongly on technical development, education, and economic policy” (Tahvonen, 1998). In their previous publications the authors of the article and other researchers proved consistently that this is true only for the countries which are – according to the classification worked out by the World Economic Forum (Lopez-Claros et al., 2005) - at the innovation-driven stage (Boronenko, 2007, 2009, 2014; Stankevics et al., 2014). But for countries which are at the efficiency-driven stage and especially at the factor-driven stage, exactly basic factor conditions such as low-cost labour and unprocessed natural resources are the dominant basis of competitive advantage and exports (Schwab, 2012).

Therefore, the Club of Rome in their classical work “The Limits of Growth” stated that “it is possible to alter this growth trends and to establish a condition of ecological and economic stability that is sustainable far into the future. The state of global equilibrium could be designed so that the basic material needs of each person on the Earth are satisfied and each person has an equal opportunity to realize his individual human potential” (Meadows et al., 1972). How is it possible to achieve sustainable territory development not consuming much energy and other natural resources but at the same time striving for the well-being of the population, i.e. for the “production of qualitative people”?

[†] Here the authors do not separate the UK from the USA perceiving the USA as a historically established “subsidiary” of England, which is still “the heart” of market-capitalist “world-economy”.

R. E. Hall and Ch. I. Jones in their article “Why Do Some Countries Produce So Much More Output per Worker than Others?” argue that the primary, fundamental determinant of a country’s long-run economic performance is its social infrastructure, i.e. institutions and government policies (Hall and Jones, 1998). Social infrastructure gives incentives for productive activities or predatory behaviour, and workers choose between production and diversion depending on existing quality of social infrastructure in their countries. Taking into consideration that territory development depends not only on the availability of resources as such but also on the possibility to use them efficiently (Pakholok, 2013; Boronenko and Drezgic, 2014), it has to be considered that such possibility is determined by institutional environment within the country, i.e. by the country’s social infrastructure which can either promote or impede a productive use of the resources available in the country. Individual achievements in health, education and income, while essential, do not guarantee in human development if social conditions constrain individual achievements (UNDP, 2013).

The World Economic Forum also argues that the importance of a sound and fair institutional environment has become even more apparent during the recent economical and financial crisis and is especially crucial for further solidifying the fragile recovery, given the increasing role played by the state at the international level and for the economies of many countries. The quality of institutions has a strong bearing on competitiveness and growth. It influences investment decisions and the organization of production and plays a key role in the ways in which societies distribute the benefits and bear the costs of development strategies and policies (Schwab, 2014).

So, further empirical identification of current “worlds-economies” was realized taking into consideration these two dimensions – energy use (“nature-friendly” dimension) and social infrastructure (“human-friendly” dimension). The set of investigated countries has to be divided into groups in relation to the average values of energy consumption and social infrastructure (Boronenko et al., 2015; Boronenko and Lavrinenko, 2016):

- 1) energy use per capita is higher than average meaning – 2700.00 kg of oil equivalent – within the set of investigated countries, but the index of social infrastructure is lower than average meaning – 4.05 points – within the set of investigated countries, i.e. the bad situation in terms of both indicators;
- 2) energy use per capita is lower than average meaning – 2700.00 kg of oil equivalent – within the set of investigated countries, and the index of social infrastructure is lower than average meaning – 4.05 points – within the set of investigated countries, i.e. the good situation in terms of energy use, but the bad one in terms of social infrastructure;
- 3) energy use per capita is higher than average meaning – 2700.00 kg of oil equivalent – within the set of investigated countries, and the index of social infrastructure is higher than average meaning – 4.05 points – within the set of investigated countries, i.e. the bad situation in terms of energy use, but the good one in terms of social infrastructure;
- 4) energy use per capita is lower than average meaning – 2700.00 kg of oil equivalent – within the set of investigated countries, but the index of social infrastructure is higher than average meaning – 4.05 points – within the set of investigated countries, i.e. the good situation in terms of both indicators.

The largest group – practically a half – in the set of investigated countries (most likely also in the world) is comprised of the countries – “ecologists with poor social infrastructure”. The main feature of this “world-economy” is a relatively low energy use per capita, although the development level of social infrastructure does not allow the countries of this “world-economy” to achieve the main aim of territory development – human well-

being (Sen, 1983; Todaro and Smith, 2011; ulHaq, 1995; Thirlwall, 2011; Lonska and Boronenko, 2012; Lonska, 2014), as the available country's resources cannot be used at their utmost for the territory development in general, but just for the development of certain privileged layers of society due to high level of crime, corruption, favouritism, etc.

The second largest group (32 countries) is comprised of the countries opposite to the first group in terms of both indicators – “energy consumers with strong social infrastructure”. They are mainly the economically developed countries of Western Europe, Scandinavia and North America (including Iceland), as well as oil Muslim countries which consume quite a lot of energy, but – surprisingly for the authors – they have a strong social infrastructure favorable for a person which enables the efficient distribution and use of available resources.

The analysis of the data shows that on the background of the above mentioned relatively large “worlds-economies” – “ecologists with poor social infrastructure” and “energy consumers with strong social infrastructure” – there appear the beginnings of new “worlds-economies” which most probably are new centers of the future dominant “worlds-economies”. These two groups of countries – “energy consumers with poor social infrastructure” and “ecologists with strong social infrastructure” – from the viewpoint of territory development are the examples of complete opposites: the first group of countries is characterized by poor situation in terms of energy use as well as social infrastructure (they are, first of all, the countries with “resources’ economies”, which have not established a strong social infrastructure, e.g. Russia); the second group of countries is vice versa characterized by a good situation in the sphere of energy use as well as social infrastructure (they are the groups of countries overspread around the world such as the groups of countries in South Asia, including China as the most significant part of this “world-economy”, in South-East Africa, Latin America and Mediterranean area).

In their previous publications the authors single out provisional leaders – politically and economically important and large countries of the identified “worlds-economies” (which enables to more easily perceive and identify the nature of each “world-economy” in the run of scientific debates) (Boronenko and Lavrinenko, 2016):

- 1) the leader of the “energy consumers with poor social infrastructure” – Russia;
- 2) the leaders of the “ecologists with poor social infrastructure” – Brazil and India;
- 3) the leaders of the “energy consumers with strong social infrastructure” – USA and UK;
- 4) the leader of the “ecologists with strong social infrastructure” – China.

At the moment, the world is undergoing an active transformation, when it is extremely important to understand into which “worlds-economies” the world is divided today and what the essence and role of each of them are. In the Introduction of the article the opinion of the Human Development Report 2013 on the presence of two “worlds-economies” in the modern global world – the growing South and the crisis North has been discussed (UNDP, 2013). The Russian economist M. Delyagin, Director of the Problems Issued by Globalization Institute, in his report at the scientific-practical conference “China and Russia in a Changing World” (Beijing, May 4, 2015) states that “in the economy a shaping division of a global financial market into the dollar, euro and yuan zones is already evident. In politics it is a restoration of a bipolar confrontation between USA and China” (Delyagin, 2015). In general, M. Delyagin is inclined to divide the global world into the western-northern and eastern-southern “worlds-economies”. Taking into consideration the arguments of the abovementioned approaches towards a provisional division of the global economic environment into “worlds-economies”, the authors suggest their own the above described approach trying to find more or less stable “worlds-economies” on

the basis of two essential characteristics – energy use and social infrastructure, i.e. to what extent modern countries are nature-friendly and human-friendly (Boronenko et al., 2015; Boronenko and Lavrinenko, 2016).

Iceland belongs to the group of “energy consumers with strong social infrastructure” (“the USA’s/the UK’s group”) within the system of modern “worlds-economies” identified by the authors. Moreover, the average level of use of energy resources per capita for the period under review in Iceland is one of the highest – second place after Qatar (World Bank, 2016) among 124 countries. Probably, it can be partially explained by northern climate, and partially by the excessive involvement of Iceland into huge industrial megaprojects (Johannesson, 2010a, 2010b; Johannesson et al., 2010).

When it comes to institutional environment, notwithstanding the above mentioned opinions and arguments by Icelandic researchers on corruption as a significant reason of Icelandic economic collapse (Benediktsson and Karlsdottir, 2011; Logason, 2012), Iceland has a relatively strong social infrastructure, although the average indicator of the quality of social infrastructure in the country is considerably lower than in its Scandinavian neighbors - Norway, Sweden and Finland, and it is also lower than in Singapore, New Zealand, Western Europe and Arabian oil monarchies, but it is higher than in the USA (Schwab, 2009, 2010, 2011, 2012, 2013).

Some researchers also argue that Iceland has “one of the least corrupt public administrations in the world, according to Transparency International” (Wade and Sigurgeirsdottir, 2012). At the same time, the Icelandic sociologist T. Logason in his book “Power Elites & Corruption” (2012) examined the influence of grand corruption as a possible cause leading to the Icelandic economic collapse in 2008. He argued that “the grand corruption that can find its way into the very core of society when the elites in politics, business and academia all join forces with the aim to deceive the general public is the most dangerous form of “grand corruption” western societies can be faced with and can lead to swift economic ruin” (Logason, 2012). The researchers of the University of Iceland K. Benediktsson and A. Karlsdottir give the same reasons explaining the Icelandic economic collapse: “many have come to the following conclusion: a neoliberal political ideology that gained ascendancy in the early 1990s had nurtured a lethal mix of greed, hubris and political corruption that had been gnawing at the roots of society. The beginning of the 21st century saw the emergence of the super-rich in Iceland – a small elite that seemed to have appeared almost out of nowhere and that flaunted its wealth rather crassly at times” (Benediktsson and Karlsdottir, 2011).

It is possible to say that there is really no deep antagonism in these opposing opinions on corruption in Iceland; the crisis itself just made researchers and experts pay more attention to institutional environment in Iceland having forced them to find the flaws in it which were not paid due attention during the economic growth. The authors find the confirmation of this viewpoint in the works by Icelandic researchers: “when social structures are stable and social systems yield expected and desirable results, there is relatively less demand for institutional economics than during times of change” (Eggertsson, 2006).

Therefore, the authors think that the main reason of a dramatic decrease in Iceland’s level of sustainable territory development during the last 10 years is the deterioration of its social infrastructure. The authors base their assumptions on the arguments provided by Icelandic researchers and their own results of analysis of statistics and data of the World Economic Forum’s surveys. What concerns the possible ways for the improvement of the quality of social infrastructure and increase in Iceland’s competitiveness, then coming back to the arguments of the Human Development Report 2013, which have been presented in the Introduction to the article. It could be suggested that one of the best source of further development for every country is efficiency interactions with other “worlds-economies”.

3. Research methodology and methods of analysis

In the methodological part of the article, first it is necessary to clarify the terms. The main concept of the research which has to be precisely interpreted is social and economic interactions of a country. In modern scientific literature on economics there is an interpretation of social and economic interactions of a country as its trade and migration flows, i.e. export and import, flows of emigrants and immigrants (Barry, 2014; Lavrinenko et al., 2017; Mensikovs et al., 2017). Within this article also Iceland's logistical interconnections (direct flights) will be investigated as the additional indicator of closest business and cultural interconnections of the country. Capital flows, i.e. flows of investments, will not be investigated within this article due to lack of official statistics on this issue.

The research methodology, presented in this section of the article, is based on classical spatial economics, which suggests that the state of territory development of a country depends not only on its own capacity but also on development of territories which are interconnected with investigated country (Kuenne, 1963; Takayama and Judge, 1964; Anselin, 1988, 2003; LeSage, 1999; Fotheringham et al., 2000; LeSage and Pace, 2009; Elhorst, 2014). Spatial dependence in a collection of sample data means that observations at location i depend on other observations at locations $j \neq i$. Formally, we might state (LeSage, 1999):

$$y_i = f(y_j), i = 1, \dots, n \quad j \neq i \quad (1)$$

In particular, it is intended to find out:

- 1) with what “worlds-economies” Iceland has more intensive and significant social and economic interactions, i.e. international trade (export and import), international migration (emigration and immigration) as well as logistical interconnections (direct flights from Reykjavik International Airport);
- 2) how these identified social and economic interactions influence territory development of Iceland;
- 3) if recommendation of Human Development Report 2013 to interact more actively with other “worlds-economies” has practical efficiency in the case of Iceland.

Further analysis is devoted to the empirical identification of social and economic interactions of Iceland – in this case, its trade and migration flows within the context of “worlds-economies” identified by the authors (in percentages from the whole figures, i.e. unit weight for every “world-economy” during last 25-27 years).

According to the researchers who study the history of Iceland, trade has always been crucial for this society (Boyer, 2009). Besides that, Icelanders have always lived in a close contact with the people who were their clients and suppliers, and, therefore, they have always been affected by them and copied them (Boyer, 2009). Therefore, the analysis of international trade flows – export and import – within the context of “worlds-economies” identified by the authors would be the most relevant way for studying social and economic interactions of Iceland in a relatively long time perspective, for which we have statistical data available.

Figure 2 and Table 1 show the data on the import of goods to Iceland for the last 27 years, also within the context of “worlds-economies” identified by the authors.

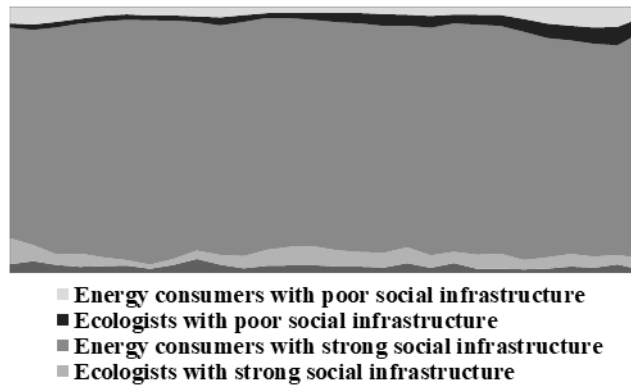


Figure 2. Export of goods from Iceland, in % to each “world-economy”, 1988-2015

Source: the authors’ calculations by the Statistics Iceland, 2016a

Table 1. Export of goods from Iceland, in % to each “world-economy”, 1988-2015

Year	“Worlds-economies”				Othercountries**	Total
	1*	2	3	4		
1988	6.16	1.63	78.91	9.95	3.35	100
1989	6.50	2.07	80.89	6.06	4.48	100
1990	5.51	2.11	85.41	3.90	3.07	100
1991	4.34	1.85	86.49	4.97	2.35	100
1992	3.22	2.18	88.71	3.29	2.60	100
1993	2.67	2.10	90.35	2.04	2.84	100
1994	3.14	1.84	91.86	1.54	1.62	100
1995	3.12	1.93	89.61	2.26	3.08	100
1996	3.47	2.15	85.93	3.14	5.31	100
1997	3.83	3.04	86.33	3.64	3.16	100
1998	3.00	2.57	88.04	4.63	1.76	100
1999	2.22	1.81	87.25	6.00	2.72	100
2000	2.21	1.95	85.94	7.02	2.88	100
2001	2.01	2.81	85.13	7.07	2.98	100
2002	2.16	3.50	85.79	6.09	2.46	100
2003	2.20	3.92	85.98	5.51	2.39	100
2004	2.59	4.48	85.33	5.52	2.08	100
2005	2.83	4.14	83.34	5.97	3.72	100
2006	3.28	4.48	85.59	4.68	1.97	100
2007	2.78	3.34	85.87	4.24	3.77	100
2008	2.84	3.75	86.52	5.32	1.57	100
2009	2.97	4.11	85.65	5.65	1.62	100
2010	4.45	4.85	85.80	3.51	1.39	100
2011	6.18	5.47	82.42	4.24	1.69	100
2012	6.97	5.54	80.33	4.71	2.45	100
2013	7.66	6.15	79.98	4.21	2.00	100
2014	7.39	6.96	78.86	3.52	3.27	100
2015	4.01	5.51	84.98	4.26	1.24	100

* 1 - Energy consumers with poor social infrastructure (Russia’s group)

2 - Ecologists with poor social infrastructure (Brazil’s/India’s group)

3 - Energy consumers with strong social infrastructure (USA’s/UK’s group)

4 - Ecologists with strong social infrastructure (China’s group)

** Countries, which had no data about energy use or/and social infrastructure

Source: the authors' calculations by the Statistics Iceland, 2016a

As the data on Figure 2 and Table 1 show, the “world-economy” to which Iceland belongs itself – “energy consumers with strong social infrastructure”, i.e. a market-capitalist “world-economy” – has the absolute advantage as a receiver of Icelandic export goods. Since 1988 the share of the market-capitalist “world-economy” has never gone down lower than 80 % within the export structure of Iceland, but in 1993-1994 it even exceeded 90 %. In 2013-2014 there was a slight “shift” towards such “worlds-economies” as “energy consumers with poor social infrastructure” and “ecologists with poor social infrastructure”, but it was an insignificant and short episode which hardly virtually changed the absolute export orientation of Iceland towards its own “world-economy”.

Within the framework of this research the authors did not analyze in detail the export structure and main partners (countries), as in order to achieve the aim of this research the authors were interested only in the “worlds-economies” context. It should be shortly pointed out that the peculiarity of directions and export structure in Iceland is its “peg” – in recent years – to one country and one product, namely, the Netherlands (Statistics Iceland, 2016a) and aluminum (Statistics Iceland, 2011), which has become one of the leaders of Icelandic export along with the implementation of industrial “large scale projects” or “megaprojects” (Johannesson, 2010a, 2010b; Johannesson et al., 2010) on the east of the country in 2004.

Figure 3 and Table 2 show the data on the import of goods to Iceland for the last 27 years, also within the context of “worlds-economies” identified by the authors.

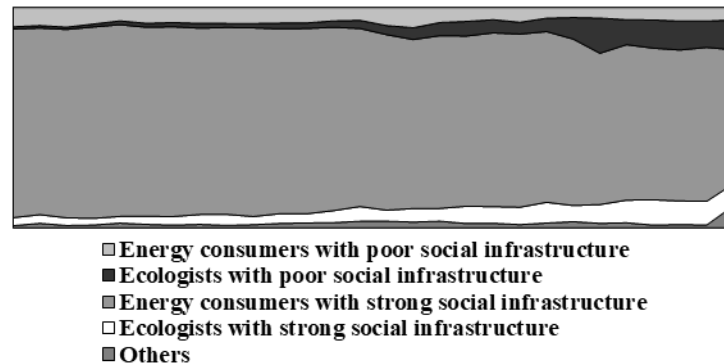


Figure 3. Import of goods to Iceland, in % from each “world-economy”, 1988-2015
Source: the authors' calculations by the Statistics Iceland, 2016b

Table 2. Import of goods to Iceland, in % from each “world-economy”, 1988-2015

Year	“Worlds-economies”				Other countries**	Total
	1*	2	3	4		
1988	8.80	1.02	85.57	3.63	0.98	100
1989	8.24	1.12	84.69	3.93	2.02	100
1990	8.96	1.05	85.47	3.50	1.02	100
1991	7.56	1.32	86.83	3.03	1.26	100
1992	6.15	1.69	86.99	3.05	2.12	100
1993	7.21	1.82	85.77	3.66	1.54	100
1994	6.86	1.92	86.09	3.91	1.22	100
1995	7.25	2.18	84.53	4.50	1.54	100
1996	7.27	1.84	84.80	4.97	1.12	100

1997	7.29	1.97	85.64	3.71	1.39	100
1998	7.12	2.61	83.88	4.42	1.97	100
1999	7.06	2.49	84.08	4.17	2.20	100
2000	6.14	2.86	83.22	5.44	2.34	100
2001	5.88	3.68	80.81	6.68	2.95	100
2002	8.23	4.15	79.61	5.01	3.00	100
2003	9.23	5.36	76.67	6.14	2.60	100
2004	6.87	5.97	78.36	5.79	3.01	100
2005	6.35	6.65	77.23	7.82	1.95	100
2006	5.60	5.98	78.82	7.54	2.06	100
2007	6.74	5.37	78.53	7.92	1.44	100
2008	4.90	6.07	77.47	9.40	2.16	100
2009	4.62	9.76	75.51	7.34	2.77	100
2010	4.85	15.95	68.66	8.53	2.01	100
2011	5.57	11.36	70.53	10.26	2.28	100
2012	5.71	12.78	68.80	11.48	1.23	100
2013	6.22	13.11	68.50	10.69	1.48	100
2014	6.19	11.95	69.84	10.78	1.24	100
2015	5.65	13.58	60.85	10.01	9.91	100

- * 1 - Energy consumers with poor social infrastructure (Russia's group)
- 2 - Ecologists with poor social infrastructure (Brazil's/India's group)
- 3 - Energy consumers with strong social infrastructure (USA's/UK's group)
- 4 - Ecologists with strong social infrastructure (China's group)
- ** Countries, which had no data about energy use or/and social infrastructure

Source: the authors' calculations by the Statistics Iceland, 2016b

According to the data summarized and presented by the authors on Figure 3 and Table 2, the import of goods to Iceland is more diversified in relation to “worlds-economies” supplying these goods as compared to the export. The market-capitalist “world-economy” – “energy consumers with strong social infrastructure” (“the USA's/the UK's group”) – is an absolute leader, although with an increasingly declining share within the general structure of import of goods to Iceland. If in 1988 the share of goods by the market-capitalist “world-economy” comprised more than 85 % within the structure of Icelandic goods imports, since the beginning of the 2000s it has never exceeded 80 %, sharply decreased after the crisis and reached 60 % in 2015.

In its turn, after the 2008 crisis, the share of goods imports from “ecologists with poor social infrastructure” (“Brazil's /India's group”) has increased significantly. It should be reminded that for a short period of time – in 2013-2014 – the share of export to Iceland of goods from this “world-economy” increased, but still the increased share of import from “ecologists with poor social infrastructure” to Iceland remains the established trend. Not analyzing the reasons for a such trend (as it goes beyond the scope of this research), it should be noted that the expansion of interactions with other “worlds-economies” in the post-crisis period happens mainly in the process of importing goods, not exporting (possibly, because of the difference in the price level on goods produced in “energy consumers with strong social infrastructure” and in “ecologists with poor social infrastructure”). But the most important thing is that the expansion of economic and social interactions through trade flows happens anyway.

It should also be pointed out that in Iceland's import-export practice, as well as in its industry there are “large scale projects” (related mainly to offshore zones) which really sharply but for a short period of time change the structure of export and import of goods. For example, 2.02 % of total export in 1996 was from the Cayman Islands (with the population of a little more than 56 thousand), 2.17% of total export in 2007 – from the Virgin

Islands (Statistics Iceland, 2016a), in 2015 the goods from Bermuda[‡] (with the population of a little more than 64 thousand) comprised 6.58 % of total import (Statistics Iceland, 2016b).

From the viewpoint of the main emphasis of this research on “worlds-economies”, the peculiarity of the process of emigration from Iceland is its absolute orientation on the same “world-economy” which Iceland itself belongs to, i.e. on “energy consumers with strong social infrastructure” (the USA’s/the UK’s group). Denmark, Norway, Sweden, the UK and the USA receive the main flow of Icelanders-immigrants. In 2012 these 5 countries received 83.1 % of the general number of Icelandic emigrants, in 2013 – 81.7 %, in 2014 – 80.8 %.

If the UK and the USA during the period under research attracted a persistently small number of emigrants from Iceland, three Scandinavian states - Denmark, Norway and Sweden – have the periods which were especially attractive for Icelandic emigrants. For example, in Sweden the period 1989-1990 was the most attractive when more than 45 % of all Icelandic emigrants chose this country. Later, in 2004-2007, Denmark became the most popular, when almost half of Icelandic emigrants left for it (it has to be reminded that this was the period of boom in Iceland, when the emigration flow was lower than usual). Icelanders started to choose Norway as the target country for their emigration – 30 % and more from the total number of emigrants after 2009. It still remains the main direction for emigration flow from Iceland.

Taking into consideration the peculiarities of direction and intensity of Icelandic emigration, it can be rather referred to as cultural-economic not just economic as it happens in Eastern European countries, for example in Latvia, Lithuania, Poland, etc.

During the analysis of the migration flows to and from Iceland the authors compared the absolute meanings of international emigration and immigration in order to qualitatively compare these two flows in the period since 1986. As results of this analysis demonstrate, the dominance of one or another process – emigration or immigration has repeatedly changed during the last 30 years. Four such periods can be conceptually singled out:

- 1) 1986-2004 – the intensity of the emigration process of Icelanders from the country quantitatively exceeded the immigration indexes, and during some periods within this time interval – dramatically (for example, in 1995 the flow of emigration 4 times exceeded the immigration flow);
- 2) 2005-2008 – the period of boom in the Icelandic financial economy, when the immigration to the country significantly exceeded the emigration (in 2007 almost 3 times);
- 3) 2009-2012 – the period of financial and economic recession, when the emigration flow again quantitatively exceeded the immigration flow to Iceland;
- 4) 2013-2014 – the period of slow revival of economy after the crisis; the dominant of migration flows changed again in favor of immigration to the country, i.e. there were considerably more immigrants than Icelanders who were leaving the country, and, the chances are that this tendency exists now.

In addition to two previously analysed types of Iceland’s interactions with other “worlds-economies”, the authors propose to take into consideration such type of logistical interactions as direct flights. The authors pay special attention to this type of interactions, as the availability of direct flights encourages a tighter and more frequent economic, social and cultural interaction between the related countries.

Prior to carrying out the quantitative analysis of influence of existing social and economic interactions on sustainable territory development of Iceland, the authors identified the main partners to which Iceland is most tightly connected by either trade, or migration, or logistical external interactions.

[‡] All these islands are overseas territories of a market-capitalist “world-economy”, and the authors admit that to relate these islands to the group “other countries” might be considered not fully correct.

In order to quantitatively assess the influence of existing social and economic interactions on sustainable territory development of Iceland, the authors carried out the linear regression analysis on the basis of the panel data about the scores of the Global Competitiveness Index (GCI) by the scale from 1 till 7 as well as changes of GCI in all main countries covered by investigated social and economic interactions of Iceland during the period of 2005-2015.

The authors make an equation of growth lines for every country from the list of main partners of Iceland in international trade, migration and air logistics (including the Iceland itself) using the following formula (Dubrova, 2003):

$$y = b_0 + b_1 * t \quad (2)$$

where y – the Global Competitiveness Index, score; t – time in years; b_0 – average weighted linear GCI for the period of 2005-2015; b_1 - average weighted linear annual change of GCI for the period of 2006-2015.

Since the final task required to achieve the aim of the research was the following one: to analyse influence of existing social and economic interactions on territory development of Iceland, the authors attempted to analyse this influence by means of a linear regression analysis where the dependant variable is annual absolute change of the GCI's score of Iceland for the period of 2006-2015, but independent variables - annual absolute changes of the GCI's score of Iceland's main partners on social and economic interactions (international trade, migration and logistics) for the period of 2006-2015.

4. Empirical data and analysis

As Table 3 shows some countries – in particular such as the USA, Spain, the UK and Germany – are among Iceland's main partners in several types of social and economic interactions at the same time. And virtually all of them, except China, Brazil and Lithuania, belong to the same “world-economy” (the same one which Iceland itself belongs to): “energy consumers with strong social infrastructure” (“the USA's/the UK's group”).

Table 3. Iceland's main partners in export and import of goods, international emigration and immigration, and logistical partners (direct flights)

Main partners in export of goods, 2015		Main partners in import of goods, 2015	
Countries	Unit weight from total export of Iceland, %	Countries	Unit weight from total import of Iceland, %
The Netherlands	27.96	Norway	10.08
Spain	12.63	Germany	7.67
UK	11.40	China	7.18
Germany	8.26	Brazil	6.59
USA	5.37	USA	6.54
Main partners in emigration, 2014		Main partners in immigration, 2014	
Countries	Unit weight from total number of emigrants with Icelandic citizenship, %	Countries	Unit weight from total number of foreign immigrants to Iceland, %
Norway	29.53	Poland	32.04

Denmark	24.38	Germany	4.76
Sweden	16.56	Spain	4.62
USA	6.12	USA	4.12
UK	4.24	Lithuania	3.91
Logistical partners (direct flights), 2015			
Canada, the United States, the United Kingdom, the Netherlands, Denmark, Norway, Sweden, Finland, Germany, France, Belgium			

Source: elaborated by the authors on the basis of Statistics Iceland, 2016a, 2016b, 2016c, 2016d, www.skyscanner.com

For assessment of the influence of existing social and economic interactions on sustainable territory development of Iceland, the authors carried out the linear regression analysis on the basis of the panel data about the scores of the Global Competitiveness Index (GCI) by the scale from 1 till 7 (see Table 4) as well as changes of GCI in all main countries covered by investigated social and economic interactions of Iceland during the period of 2005-2015 (see Table 5).

Table 4. Panel data on the Global Competitiveness Index of countries – main partners of Iceland in international trade, migration and air logistics, scores from 1 till 7, 2005-2015

Countries	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Iceland	5.34	5.40	5.02	5.05	4.80	4.68	4.75	4.74	4.66	4.71	4.83
Belgium	5.23	5.27	5.10	5.14	5.09	5.07	5.20	5.21	5.13	5.18	5.20
Brazil	4.08	4.03	3.99	4.13	4.23	4.28	4.32	4.40	4.33	4.34	4.08
Canada	5.39	5.37	5.34	5.37	5.33	5.30	5.33	5.27	5.20	5.24	5.31
China	4.26	4.24	4.57	4.70	4.74	4.84	4.90	4.83	4.84	4.89	4.89
Denmark	5.73	5.70	5.55	5.58	5.46	5.32	5.40	5.29	5.18	5.29	5.33
Finland	5.73	5.76	5.49	5.50	5.43	5.37	5.47	5.55	5.54	5.50	5.45
France	5.39	5.31	5.18	5.22	5.13	5.13	5.14	5.11	5.05	5.08	5.13
Germany	5.56	5.58	5.51	5.46	5.37	5.39	5.41	5.48	5.51	5.49	5.53
Lithuania	4.51	4.53	4.49	4.45	4.30	4.38	4.41	4.41	4.41	4.51	4.55
Netherlands	5.39	5.56	5.40	5.41	5.32	5.33	5.41	5.50	5.42	5.45	5.50
Norway	5.31	5.42	5.20	5.22	5.17	5.14	5.18	5.27	5.33	5.35	5.41
Poland	4.38	4.30	4.28	4.28	4.33	4.51	4.46	4.46	4.46	4.48	4.49
Spain	4.80	4.77	4.66	4.72	4.59	4.49	4.54	4.60	4.57	4.55	4.59
Sweden	5.55	5.74	5.54	5.53	5.51	5.56	5.61	5.53	5.48	5.41	5.43
UK	5.51	5.54	5.41	5.30	5.19	5.25	5.39	5.45	5.37	5.41	5.43
USA	5.85	5.61	5.67	5.74	5.59	5.43	5.43	5.47	5.48	5.54	5.61

Source: Lopez-Claros et al., 2005; Lopez-Claros, 2006; Lopez-Claros, Schwab, 2007; Schwab, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015.

Table 5. Panel data on annual absolute changes of scores of the Global Competitiveness Index of countries – main partners of Iceland in international trade, migration and air logistics, 2006-2015

Countries	2006 /05	2007 /06	2008 /07	2009 /08	2010 /09	2011 /10	2012 /11	2013 /12	2014 /13	2015 /14
Iceland	+0.06	-0.38	+0.03	-0.25	-0.12	+0.07	-0.01	-0.08	+0.05	+0.12
Belgium	-0.04	+0.17	-0.04	+0.05	+0.02	-0.13	-0.01	+0.08	-0.05	+0.02
Brazil	-0.05	-0.04	+0.14	+0.10	+0.05	+0.04	+0.08	-0.07	+0.01	-0.26
Canada	-0.02	-0.03	+0.03	-0.04	-0.03	+0.03	-0.06	-0.07	+0.04	+0.07
China	-0.02	+0.33	+0.13	+0.04	+0.10	+0.06	-0.07	+0.01	+0.05	0.00

Denmark	-0.03	-0.15	+0.03	-0.12	-0.14	+0.08	-0.11	-0.11	+0.11	+0.04
Finland	+0.03	-0.27	+0.01	-0.07	-0.06	+0.10	+0.08	-0.01	-0.04	-0.05
France	-0.08	-0.13	+0.04	-0.09	0.00	+0.01	-0.03	-0.06	+0.03	+0.05
Germany	+0.02	-0.07	-0.05	-0.09	+0.02	+0.02	+0.07	+0.03	-0.02	+0.04
Lithuania	+0.02	-0.04	-0.04	-0.15	+0.08	+0.03	0.00	0.00	+0.10	+0.04
Netherlands	+0.17	-0.16	+0.01	-0.09	+0.01	+0.08	+0.09	-0.08	+0.03	+0.05
Norway	+0.11	-0.22	+0.02	-0.05	-0.03	+0.04	+0.09	+0.06	+0.02	+0.06
Poland	-0.08	-0.02	0.00	+0.05	+0.18	-0.05	0.00	0.00	+0.02	+0.01
Spain	-0.03	-0.11	+0.06	-0.13	-0.10	+0.05	+0.06	-0.03	-0.02	+0.04
Sweden	+0.19	-0.20	-0.01	-0.02	+0.05	+0.05	-0.08	-0.05	-0.07	+0.02
UK	+0.03	-0.13	-0.11	-0.11	+0.06	+0.14	+0.06	-0.08	+0.04	+0.02
USA	-0.24	+0.06	+0.07	-0.15	-0.16	0.00	+0.04	+0.01	+0.06	+0.07

Source: calculated by the authors on the basis of Lopez-Claros et al., 2005; Lopez-Claros, 2006; Lopez-Claros, Schwab, 2007; Schwab, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015

For clarity, the data in Table 5 on annual absolute changes of scores of the GCI for all countries which are Iceland's main partners in international trade, migration and logistics is shown in Figure 4.

As it can be seen on Figure 4, the trends of changes of scores of the GCI of the partner countries of Iceland (including Iceland itself) are visually similar – periods of growth are cyclically replaced with periods of decline, but the common line points at stagnation in the development of competitiveness of these countries, the vast majority of which belong to a capitalist “world-economy” of energy consumers with strong social infrastructure (“the USA's/the UK's group”). Nevertheless, this visual similarity should be mathematically tested, for example, with the help of creation of models of growth lines using the method of regressive curve estimation (Dubrova, 2003).

Table 6. The models of growth lines of countries – main partners of Iceland in international trade, migration and air logistics, GCI scores, 2005-2015

Country	Mth	Rsqr	d.f.	F	Sigf	b0	b1
Iceland	LIN	0.661	9	17.59	0.002	5.2924	-0.0642
Belgium	LIN	0.006	9	0.06	0.814	5.1747	-0.0015
Brazil	LIN	0.371	9	5.30	0.047	4.0433	+0.0263
Canada	LIN	0.637	9	15.78	0.003	5.3976	-0.0140
China	LIN	0.748	9	26.74	0.001	4.3193	+0.0635
Denmark	LIN	0.814	9	39.37	0.000	5.7331	-0.0490
Finland	LIN	0.295	9	3.77	0.084	5.6436	-0.0195
France	LIN	0.706	9	21.61	0.001	5.3238	-0.0256
Germany	LIN	0.036	9	0.34	0.575	5.5044	-0.0039
Lithuania	LIN	0.001	9	0.01	0.917	4.4549	0.0008
Netherlands	LIN	0.034	9	0.31	0.590	5.4024	+0.0040
Norway	LIN	0.049	9	0.46	0.513	5.2335	+0.0065
Poland	LIN	0.591	9	12.99	0.006	4.2773	+0.0209
Spain	LIN	0.569	9	11.88	0.007	4.7613	-0.0226
Sweden	LIN	0.461	9	7.70	0.022	5.6445	-0.0182
UK	LIN	0.024	9	0.22	0.650	5.4158	-0.0049
USA	LIN	0.388	9	5.71	0.041	5.7336	-0.0250

Source: calculated by the authors using SPSS software on the basis of Lopez-Claros et al., 2005; Lopez-Claros, 2006; Lopez-Claros, Schwab, 2007; Schwab, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015.

Table 6 presents mathematically, and Appendix – graphically that the estimated growth lines of investigated countries are not really identical but sometimes are not identical at all to the trend of Iceland's competitiveness. It can be stated that Iceland's partners such as Canada, the USA, Denmark, Sweden, Finland, France and Spain

develop following the falling trend similar to Iceland's one (see Table 6 and Appendix). The growth lines of Germany, the UK, Belgium and Lithuania in their turn demonstrate a minimal negative slope close to a horizontal line. Norway and the Netherlands turn their growth lines towards the rise, minimal though. Finally, Poland, Brazil and China demonstrate explicitly positive growth trends. It is interesting that the last two countries – Brazil and China – represent other “worlds-economies”, while all the rest of the countries belong to the same “world-economy” as Iceland. It should be mentioned that Poland which is included into a capitalist “world-economy” according to its indexes of energy consumption and social infrastructure is very close to “Brazil's/India's group” – “ecologists with poor social infrastructure”.

The mathematical and graphical analyses of the competitiveness trends of the countries which are Iceland's main partners in international trade, migration and logistics showed that not all of them during the last 10 years have been developing according to the falling trend similar to Iceland's one (it especially refers to the countries which belong to other “worlds-economies”).

Since the final task required to achieve the aim of the research was the following one: to analyse influence of existing social and economic interactions on territory development of Iceland, the authors attempted to analyse this influence by means of a regression analysis where the dependant variable is annual absolute change of the GCI's score of Iceland for the period of 2006-2015, but independent variables – annual absolute changes of the GCI's score of Iceland's main partners on social and economic interactions (international trade, migration and logistics) for the period of 2006-2015.

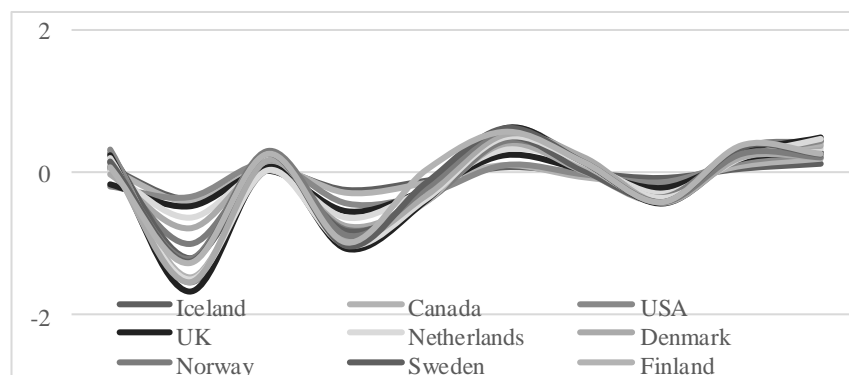


Fig.4. Annual absolute changes of scores of the Global Competitiveness Index of countries – main partners of Iceland in international trade, migration and air logistics, 2006-2015

Source: calculated by the authors on the basis of the panel data from the Table 5

5. Results and discussion

The regression analysis shows the following results for the most significant social and economic interactions of Iceland within export of goods and immigration of foreigners:

$$y = -0.001 + 1.675 * x_1 + 0.604 * x_2 \quad (3)$$

where y - annual absolute change of the GCI's score of Iceland; x_1 – annual absolute change of the GCI's score of Spain; x_2 - annual absolute change of the GCI's score of the USA.

It practically means that the annual absolute increase of the GCI's score in Spain for 1 point (for example, from 5 to 6) causes an increase of Iceland's GCI for 1.675 points, i.e. from 5 to 6.68), but the annual absolute increase of the GCI's score in the USA for one point (for example, from 5 to 6) causes an increase of Iceland's GCI for 0.604 points, i.e. from 5 to 5.6). All other of Iceland's most significant partners in export and immigration – the Netherlands, the UK, Germany, Poland and Lithuania (see Table 1) – were excluded from regressive equation as non-significant variables which are not influencing an annual absolute change of the GCI's score in Iceland. The first – constant – element of regressive equation means Iceland's own trend of annual absolute change of the GCI's score without influence of Spain and the USA. So, it has to be concluded that export of goods to Spain and the USA as well as immigration from these countries positively influence negative trend of territory development of Iceland (measured by the GCI).

Further regression analysis shows the following results for the most significant social and economic interactions of Iceland within import of goods:

$$y = 0.028 - 1.277 * x_1 + 1.191 * x_2 + 0.442 * x_3 \quad (4)$$

where y - annual absolute change of the GCI's score of Iceland; x_1 – annual absolute change of the GCI's score of China; x_2 - annual absolute change of the GCI's score of Norway; x_3 - annual absolute change of the GCI's score of the USA.

It practically means that the annual absolute increase of the GCI's score in China for one point (for example, from 5 to 6) causes a decrease of Iceland's GCI for 1.277 points, i.e. from 5 to 3.72), the annual absolute increase of the GCI's score in Norway for one point (for example, from 5 to 6) causes an increase of Iceland's GCI for 1.191 points, i.e. from 5 to 6.2) but the annual absolute increase of the GCI's score in the USA for one point (for example, from 5 to 6) causes an increase of Iceland's GCI for 0.442 points, i.e. from 5 to 5.4). All the other of Iceland's most significant partners in import of goods –Germany and Brazil (see Table 1) – were excluded from regressive equation as non-significant variables which are not influencing an annual absolute change of the GCI's score in Iceland. So, it has to be concluded that import of goods from Norway and the USA positively influences the trend of sustainable territory development of Iceland (measured by the GCI), but import of goods from China – vice versa – negatively influences the trend of territory development of Iceland.

Further regression analysis shows the following results for the most significant social and economic interactions of Iceland within air logistics, i.e. direct flights:

$$y = -0.023 - 1.491 * x_1 + 0.922 * x_2 \quad (5)$$

where y – annual absolute change of the GCI's score of Iceland; x_1 – annual absolute change of the GCI's score of Belgium; x_2 - annual absolute change of the GCI's score of France.

It practically means that the annual absolute increase of the GCI's score in Belgium for one point (for example, from 5 to 6) causes a decrease of Iceland's GCI for 1.491 points, i.e. from 5 to 3.5), but the annual absolute increase of the GCI's score in France for one point (for example, from 5 to 6) causes an increase of Iceland's GCI for 0.922 points, i.e. from 5 to 5.9). All the other of Iceland's most significant partners in air logistics – Canada, the USA, the UK, the Netherlands, Denmark, Norway, Sweden, Finland and Germany (see Table 1) – were excluded from regressive equation as non-significant variables which are not influencing an annual absolute change of the GCI's score in Iceland. So, it has to be concluded that partnership with France in air logistics positively influences the trend of sustainable territory development of Iceland (measured by the GCI), but with Belgium – negatively.

The last regression analysis for the most significant social and economic interactions of Iceland within emigration excludes all main destinations of emigration of Icelandic citizens (see Table 1) from regressive equation as non-significant variables which are not influencing an annual absolute change of the GCI's score in Iceland. So, it has to be concluded that such kind of social and economic interactions as emigration of Icelandic citizens does not influence trend of territory development of Iceland.

Conclusions

The research hypothesis that Iceland's sustainable territorial development (in particular, negative trend during the last 10 years) is greatly determined by intensity and direction of Iceland's social and economic interactions, has been proved.

As the outcomes of the research showed:

- 1) Iceland is interconnected mainly with the representatives of its own "world-economy", i.e. the countries-representatives of "the USA's/the UK's group" are Iceland's main partners in international trade, migration, and air logistics. A kind of sub-"world-economy" is formed which can be referred to as a Northern-Atlantic one;
- 2) these social and economic interactions (with the representatives of its own "world-economy") mainly draw Iceland's sustainable territory development in their direction, and, as the trends of their sustainable development are negative or stagnate (see Appendix), Iceland's trend of competitiveness is also drawn after them, especially after the USA and Spain;
- 3) rather infrequent (low intensity) social and economic interactions with the countries – representatives of other "worlds-economies" either do not influence significantly Iceland's sustainable territory development (the case with Brazil) or influence in the opposite way (the case with China), i.e. the growth in China means the fall in Iceland.

Therefore, the practical efficiency of recommendation of Human Development Report 2013 to interact more actively with other "worlds-economies" is not so far proved in social and economic reality – at least, in the case with Iceland as a typical highly-developed capitalist country.

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Annex

Growth lines of Iceland's partners created by the regressive curve estimation method, the Global Competitiveness Index, 2005-2015.

Fig. 5. Growth line of **Canada** created by the regressive curve estimation method, the Global Competitiveness Index, 2005-2015

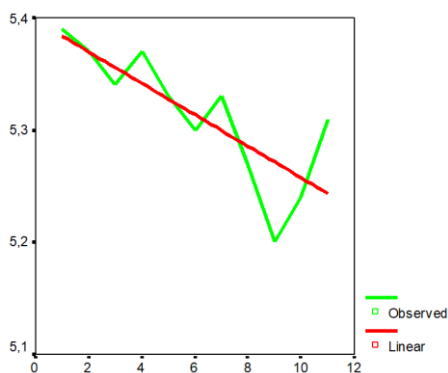


Fig. 6. Growth line of the **USA** created by the regressive curve estimation method, the Global Competitiveness Index, 2005-2015

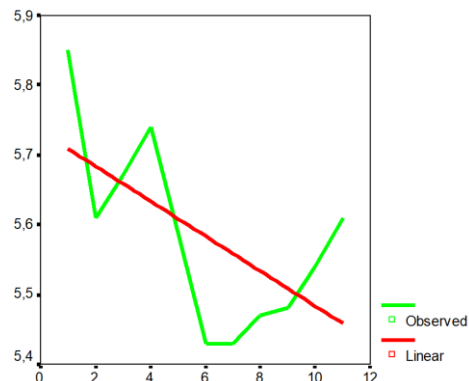


Fig.7. Growth line of **Denmark** created by the regressive curve estimation method, the Global Competitiveness Index, 2005-2015

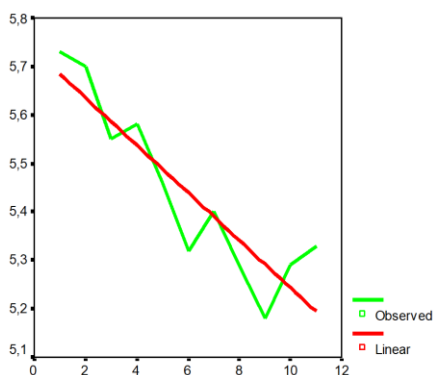
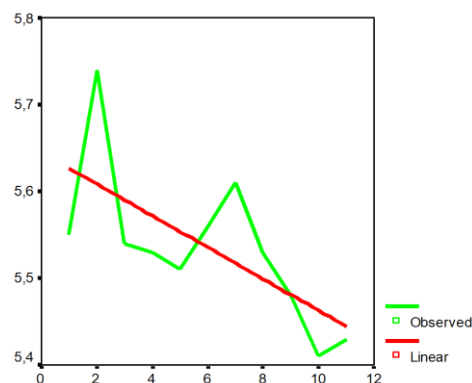


Fig.8. Growth line of **Sweden** created by the regressive curve estimation method, the Global Competitiveness Index, 2005-2015



Source: elaborated by the authors using SPSS software on the basis of Lopez-Claros et al., 2005; Lopez-Claros, 2006; Lopez-Claros, Schwab, 2007; Schwab, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015.

Fig. 9. Growth line of **Finland** created by the regressive curve estimation method, the Global Competitiveness Index, 2005-2015

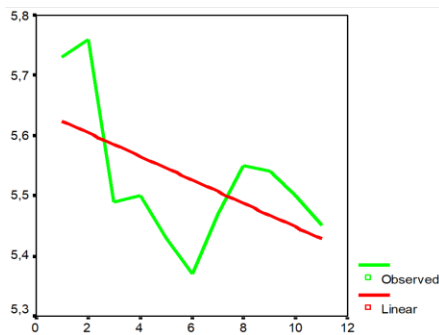


Fig. 10. Growth line of **France** created by the regressive curve estimation method, the Global Competitiveness Index, 2005-2015

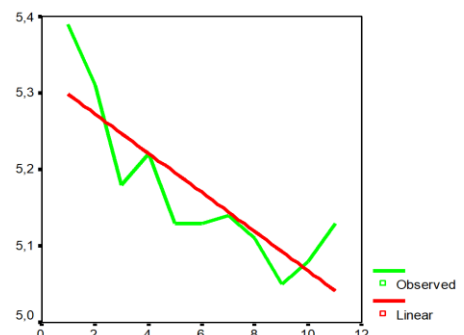


Fig.11.Growth line of **Spain** created by the regressive curve estimation method, the Global Competitiveness Index, 2005-2015

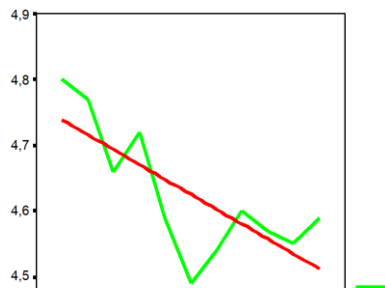


Fig.12.Growth line of **Germany** created by the regressive curve estimation method, the Global Competitiveness Index, 2005-2015



Fig. 13. Growth line of the **UK** created by the regressive curve estimation method, the Global Competitiveness Index, 2005-2015

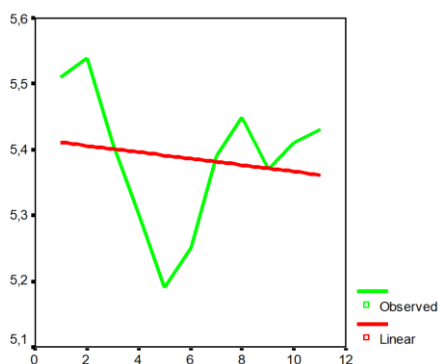


Fig. 14. Growth line of **Belgium** created by the regressive curve estimation method, the Global Competitiveness Index, 2005-2015

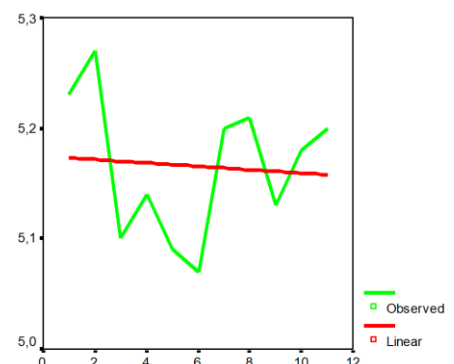


Fig.15. Growth line of **Lithuania** created by the regressive curve estimation method, the Global Competitiveness Index, 2005-2015

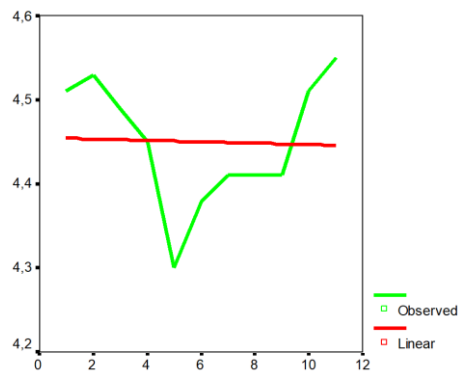
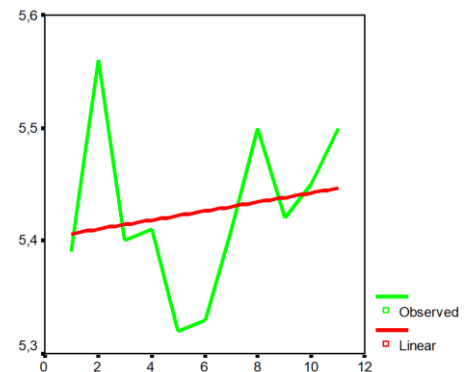


Fig. 16. Growth line of **Netherlands** created by the regressive curve estimation method, the Global Competitiveness Index, 2005-2015



Source: elaborated by the authors using SPSS software on the basis of Lopez-Claros et al., 2005; Lopez-Claros, 2006; Lopez-Claros, Schwab, 2007; Schwab, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015.

Fig. 17. Growth line of **Norway** created by the regressive curve estimation method, the Global Competitiveness Index, 2005-2015

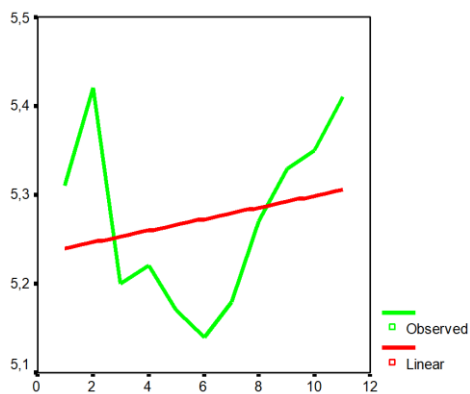


Fig. 18. Growth line of **Poland** created by the regressive curve estimation method, the Global Competitiveness Index, 2005-2015

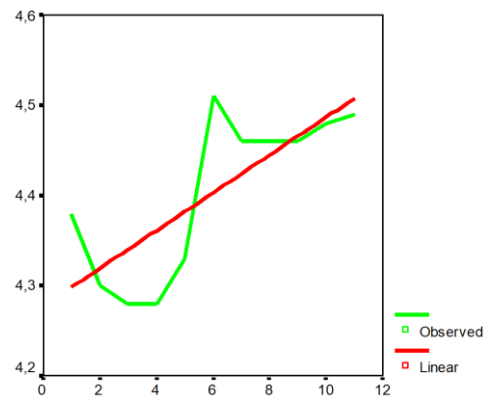


Fig. 19. Growth line of **Brazil** created by the regressive curve estimation method, the Global Competitiveness Index, 2005-2015

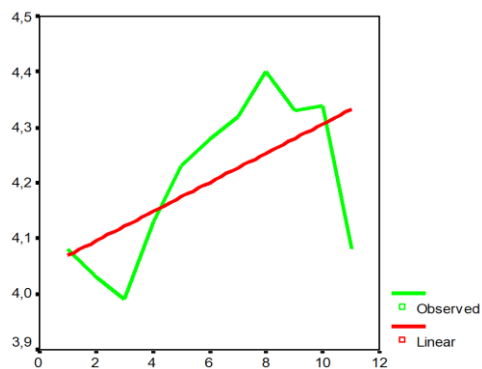
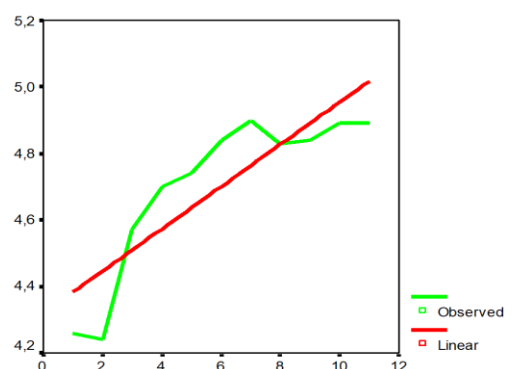


Fig. 20. Growth line of **China** created by the regressive curve estimation method, the Global Competitiveness Index, 2005-2015



Source: elaborated by the authors using SPSS software on the basis of Lopez-Claros et al., 2005; Lopez-Claros, 2006; Lopez-Claros, Schwab, 2007; Schwab, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015.

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THE BRAZILIAN AMAZON: A RESOURCE CURSE OR RENEWED COLONIALISM?*

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Abstract. The aim of this paper is to highlight the effect of the endowment of resources on development through the analysis of the impact of national strategy, both at a regional and local level. The research focuses on the *Legal Amazon*[†], through the georeferenced analysis of socio-economic data from the last three censuses (1991, 2000 and 2010), in order to demonstrate how the Brazilian national energy strategy is contributing to the perpetuation of the phenomenon of the *endowment trap*[‡] at a regional level. Despite boosting the national growth, the concentration of sector-based projects in resource-abundant areas is unable to eradicate inequalities, which in turn perpetuates the *path dependence*[§].

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[†] Composed by all seven states of the Northern Region (Acre, Amapá, Amazonas, Pará, Rondônia, Roraima, Tocantins) to which the Maranhão (North-East Region) and the Mato Grosso (Center-East) are also added.

[‡] Occurs when the development trajectory of a resource-abundant country mainly relies on primary product exploitation (Auty, 2001). The phenomenon can also produce the same implications in the internal energy market.

[§] The concept aims to frame the way in which historical events can 'lock in' pathways of development (Martin and Sunlay, 2006).

Keywords: Brazil; Legal Amazon; Dependency; Inequality; Human Development

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JEL Classifications: O38, O44, O54

1. Introduction

Following the recent Rousseff impeachment (OECD, 2015), Brazil is currently emerging from a political and economic crisis. Factors such as corruption as well as the social policies applied by President's Rousseff's party seem to have contributed to strengthened dependence at regional level rather than producing structural changes and improving welfare (Traspadini, 2014). As a consequence, political tools proposed by the current government are aimed at reducing public spending and stimulating growth, in line with the Latin American switch from heterodox economic policies to neoliberal interventions for a steady recovery (Wylde, 2016). Therefore, in order for economic growth to occur, energy production and its material applications (such as electrification) is of pivotal importance, even in spite of the threat this poses to territory and population (Kileber and Parente, 2015). Section two will outline the effect of the endowment of resources on the Brazilian energy strategy and highlight the role of Legal Amazon in the national energy strategy, taking into consideration the matter of misallocation of benefits from resource exploitation (Fearnside, 2016). Section three will then showcase a number of figures indicating how the realization of big projects have improved development in the state of Pará. Finally, section four will look at a brief study of the correlation between human development and income per capita (PNUD; IPEA; FJP 2017).

2. A resource curse or renewed colonialism?

Brazil is a medium income country with an abundance of natural resources (OECD, 2015). However, due to its developing condition, these characteristics expose it to the *resource curse phenomenon* (Costantini and Monni, 2008 a. and b.; Auty, 2001). Such dynamics may present themselves specifically in the scenario of the energetic sector (Kileber and Parente, 2015). However, regardless of its high hydroelectric potential, Brazil appears to have broken free of the energetic trap, despite the fact that the process of diversification does not follow the *energy ladder*^{**} criteria (Burke, 2012). In fact as the percentage of other renewable sources increases, the hydroelectric sector decreases only relatively, with a yet significant use of fossil fuel such as wood and coal, thus moving away from those objectives of environmental protection which truly represent a fundamental part of well-being (Brand-Correa and Steinberger, 2017).

A crucial topic relating to the exploitation of natural resources by a sector-based programme in Brazil is that of water destined for the use of energy production, since this allows Brazil to gain greater energy independence from the rest of the world. Though intended for noble purposes, this use of water generates notable impacts: firstly, institutions do not sufficiently facilitate an equitable and reliable supply of water; secondly, its pollution and uneven distribution affects social life and public health, since both private sectors and large public companies are more interested in focusing on the expected revenues from the energy sector rather than providing basic welfare

^{**} The energy ladder concept posits that countries move to more sophisticated energy carriers as their income increases (i.e. shifting from traditional biomass to more modern and efficient fuels). For instance, in the energy sector high income conditions foster the development of new technologies of energy production which are usually cleaner and more modern than previous methods.

services (Cori and Monni, 2015). Appropriation of water by public and private enterprises in order to produce energy may threaten the process of universalization of access to water. Furthermore, it can damage local economies (e.g. through the interruption of water flows that could have otherwise been used for transportation and commerce) with huge negative impacts being suffered mostly by the local communities (Monni and Realini, 2017).

The construction of extractive poles as a fully-fledged way to occupy the Amazon in the name of national interest has been implemented since the seventies; the area, as well as the reach of mineral resources and water, have suffered a thoughtless and accelerate occupation (Becker, 2005). National strategy has revealed itself to be of an excluding nature, rendering the development process extremely unbalanced and adverse for the Amazon. Sector-based projects often benefit external actors (i.e. profit leakage and tax relief for foreign ventures), while the local population suffers environmental and social costs (Fernandes et al. 2017). Moreover, the exploitation and occupation of the land endanger the conservation and safeguarding of both the territory and its population and culture, making the matter of the Amazon a social and political issue rather than a merely technical-scientific one (Magalhães Filho, 1987; Fearnside, 2017).

3. National programmes between economic growth and human development

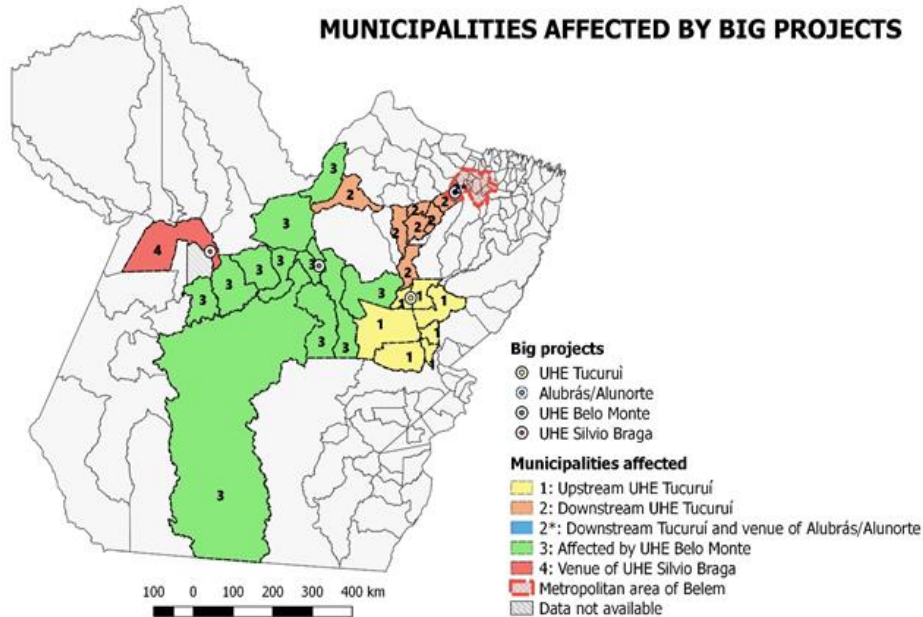
Since the era of the *Grande Brasil*^{††} the Amazon has been subjected to sector-based programmes aimed at improving national development, as well as regional projects aimed at improving regional development, though the latter have proved unsuccessful in achieving the expected development goals (Magalhães, 1987). In fact, projects of regional interest usually absorb limited resources compared to national ones, which are instead highly financed by national and international capital. Nevertheless, although the latter strategies should ideally be conceived as inclusive, they tend to imply a small number of local concerns (Buarque, 1987). For example, whilst the northern region (which has been affected since the '70s by sector-based programs due to its availability of resources) maintains unsatisfactory levels of development, the state of Pará has the lowest MHDI of the whole area (PNUD-IPEA-FJP 2017), regardless of the fact that it hosts Belém. In fact, in 1991 none of its municipalities belonged to the top 10 cities of the State. However, from 1991 to 2010, 3 of its municipalities remained among the last 10, with Melaço performing the worst MHDI (0.418) in 2010, not only out of the northern region but of Brazil as a whole (PNUD-IPEA-FJP, 2017).

Despite the realization of *Grande Carajás*, one of the main sector-based Brazilian programs, the state of Pará maintains unsatisfactory levels of development (PNUD; IPEA; FJP 2017). Our goal is to focus on this state in order to highlight the performance of 27 municipalities directly or indirectly affected by sector-based projects. The analysis is based on georeferentiated data (Lelo, 2011) from the last IBGE^{‡‡} census (1991, 2000 and 2010) and takes three indicators into account: the income per capita, the percentage of population vulnerable to poverty and the inequality (Sen, 2005; Ehrhart, 2009; Azeem et al., 2017; Santos et al., 2017; Menshikov et al., 2017). The selected municipalities are gathered into five groups depending on their geographical relation to their pertaining sector-based projects: M1 (upstream municipalities affected by Tucurí UHE); M2 (downstream municipalities affected by Tucuruí UHE); M2* (Barcarena, headquarter of Hydro Alunorte); M3 (municipalities affected by Belo Monte UHE); M4 (Santarem, headquarter of Silvio Braga UHE) (Map 1).

^{††} Expression meaning “Big Brazil”. It refers to the 5th Republic, that is to say the period of the dictatorship (Motta, 2007).

^{‡‡} Brazilian Institute of Geography and Statistics.

Map 1. 27 municipalities affected by sector-based projects in Pará

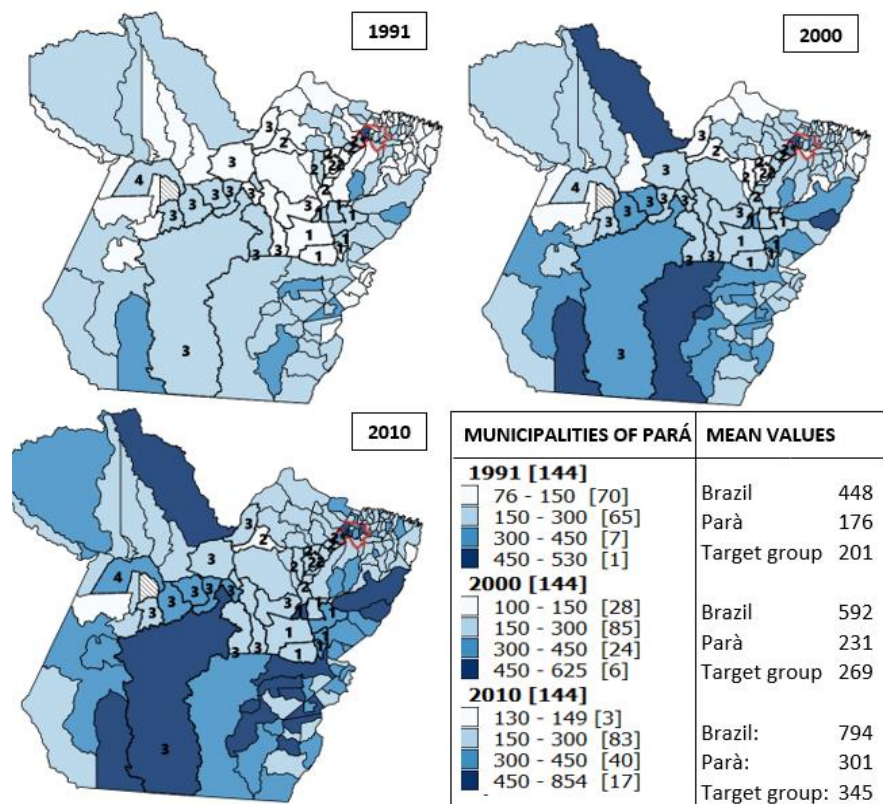


Source: Personal elaboration from PNUD; IPEA; FJP 2017

The more recent the year, the higher the income per capita in all groups. However, the data shows better results in terms of income increase than in terms of decrease of vulnerability to poverty. In fact, since the Gini index is the only ratio in which all target groups have performed increasingly worse throughout the years, in each year the substantial increase in income occurs in the presence of constant inequality (PNUD-IPEA-FJP, 2017).

The rate of growth of the income per capita is on average positive for all the units between 1991 and 2000. Brazil demonstrates a +3% growth rate per year, as well as Pará and M4 with only M3 and M2 performing better (at +5% and +4% respectively). The worse performance is by M2* and M1 (+2%). In the 2000-2010 decade, Brazil maintains a 3% growth rate of income per capita, whilst lower growth rates occur in Pará for municipalities with a more advanced state of economic development (Map 2).

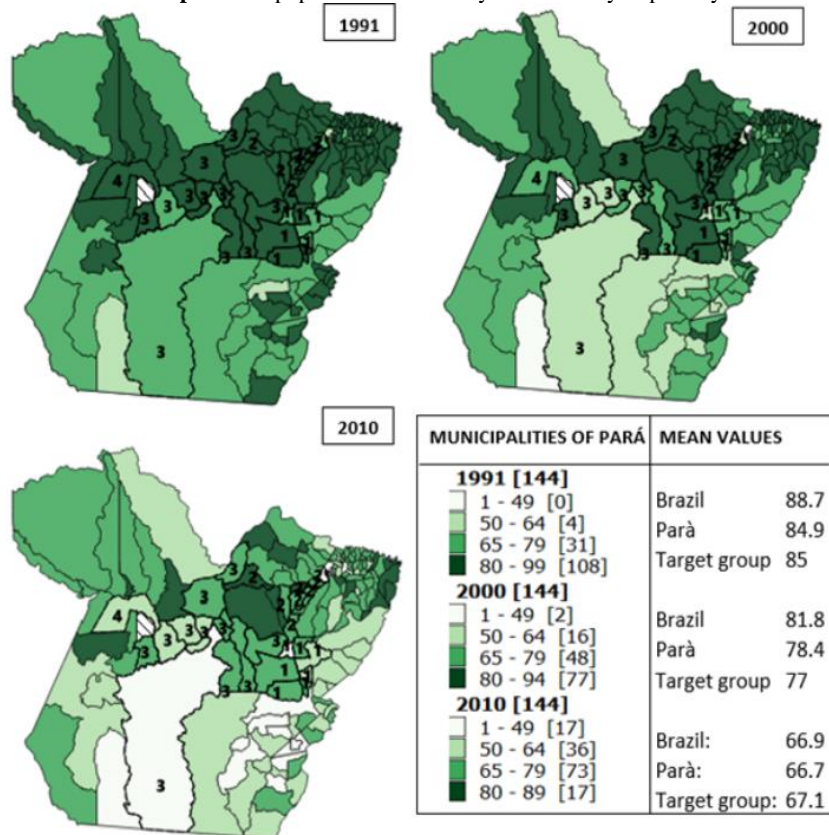
Map 2. Per capita income (BR R\$)



Source: Personal elaboration from PNUD-IPEA-FJP, 2017. Data relates to the ratio between the sum of the income of all individuals living in permanent private households and the total number of these individuals. Amounts in BR R\$ as of August 1st 2010.

However, though it is not possible to identify a trend owing to the lack of data (census data only) and to the fact that the behavior of the selected cities is largely heterogeneous, it can be said that from 1991 to 2010, each city has witnessed a reduction of sorts in the percentage of population vulnerable to poverty (Map 3).

Map 3. % of population affected by vulnerability to poverty



Source: Personal elaboration from PNUD-IPEA-FJP, 2017. Data refers to the proportion of individuals living in permanent private households with per capita household income equal to or less than 255 BR R\$ per month as of August 1st 2010, equivalent to 1/2 minimum salary at that time

In 1991 high levels of vulnerability to poverty were registered at all levels of disaggregation, but a reasonable reduction is registered in 2000, with a further effort made in 2010. The best result has been achieved at a federal level: between 2000 and 2010 Brazil has reduced its vulnerability rate by 15%. The decrease in poverty is not a sufficient indication of a positive trajectory of development since the Gini index holds disappointing results. For Tucuruí (the leading municipality in M2) and Altamira (the leading municipality in M3), both decades show that the change in population vulnerable to poverty (-41% and -35% respectively) is less than proportional to the increase in per capita income (+78% and +107%) (PNUD, 2017). Instead, the reduction in the percentage of the poverty-vulnerable population in M2* by -78% is more proportional than the +51% increase in per capita income throughout the whole period. In 2010 Santarém (M4) registered a vulnerability rate of 55%, that is to say more than 10 points below the mean of Brazil, Pará and target municipalities (66.9%, 66.7% and 67.1% respectively)

(PNUD-IPEA-FJP, 2017). From decade to decade, all the selected municipalities show better results in terms of income increase than in terms of reduction of vulnerability to poverty (PNUD-IPEA-FJP, 2017) (Figure 1).

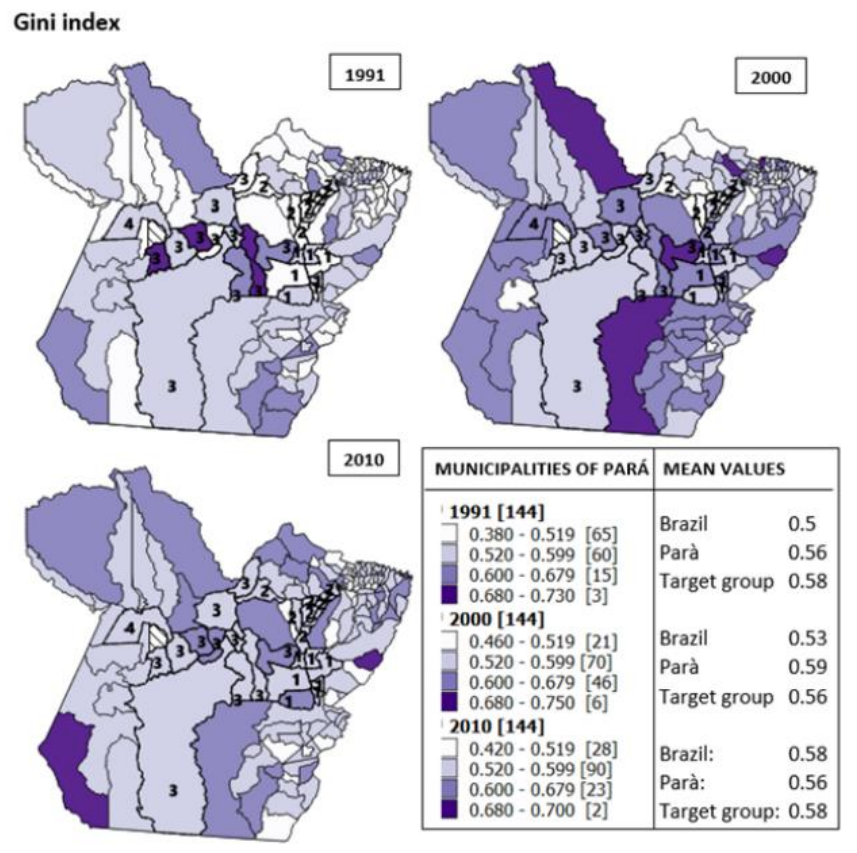
Fig. 1 Vulnerability to poverty



Source: Personal elaboration from PNUD-IPEA-FJP, 2017. The graph compares the variation of the rate of growth of the income per capita with the decrease of the percentage of population vulnerable to poverty in four pivotal cities in the state of Pará between 1991 and 2000, and also between 2000 and 2010

At each level, the substantial increase in income occurs in the presence of constant inequality. The increase in inequalities is structured in two phases: the former, between 1991 and 2000, experienced an absolute worsening; the latter, between 2000 and 2010, showed a relative decreasing. In 2010, compared to 1991, Brazil had a worse income distribution, as can be seen by the +0.08 points increase in the Gini index, while both Pará and the target municipalities show a smaller increase in inequality, amounting to +0.03 points on average (Map 4).

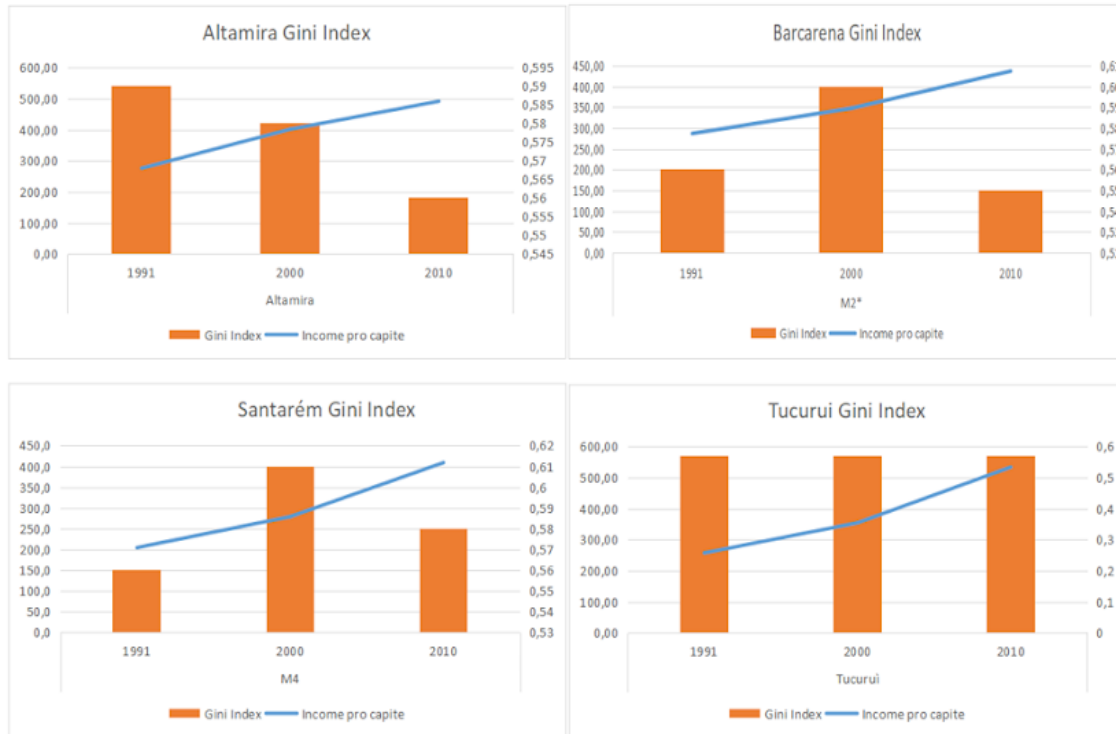
Map 4. Inequality (Gini Index)



Source: Personal elaboration from PNUD-IPEA-FJP, 2017. Data measures the degree of inequality in the distribution of individuals according to per capita household income. Its value varies from zero when there is no inequality (household income per capita of all individuals has the same value) to 1, when inequality is at its maximum (only one individuals owns all income). The population of individuals is limited to those living in permanent private households

All target groups obtained worse results when compared to Brazil and Pará. On the one hand, M2* (Barcarena, leading municipality of the M1 group) registered the highest value in 1991 and also in 2010, while M1's results are particularly worrying due to their constant increase in the index. Instead, in this scenario Tucuruí (the leading municipality of M2) has no change in the Gini index despite the increase in incomes (this would also partially explain the slow reduction of vulnerability to poverty). Tucuruí is reduces the percentage of vulnerability to poverty at a slower rate than the increase in per capita income. Moreover, despite its large power plant and energy attractiveness, the city scores a "potentially unsustainable" Gini index with a merely "intermediate" per capita income (Fapespa, 2016). On the other hand, although it was not yet hosting the Belo monte power plant, Altamira (the leading municipality of the M3 group) reduced inequality by -2% and -3%, in the first and second decade respectively, recording a potentially unsustainable Gini index all the same (Fapespa, 2016). (Figure 2).

Fig. 2. Gini Index



Source: Personal elaboration from PNUD-IPEA-FJP, 2017. The graph compares the income per capita (expressed in BR R\$ as of August 1st 2010) with the Gini index for four pivotal cities in the state of Pará in 1991, 2000 and 2010

Such results are clearly also induced by the geo-political history of the territories in question.

Despite their common development path, the four main cities focused on in the above analysis display heterogeneous territories as well as heterogeneous inclinations (Rocha, 2008; 2016). However, it is important to acknowledge that at the time of analysis each city was affected by large heterogeneous sector-based projects (CBDB, 2011; Fapespa, 2015) which are still in act.

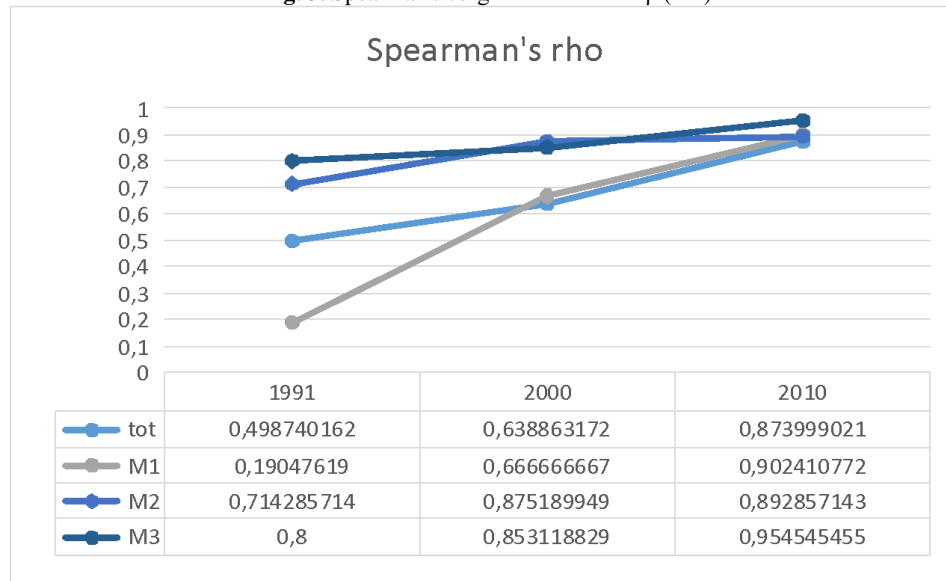
4. The path of development

Based on a *logical dependence* between per capita income and human development, it can be hypothesised that per capita income substantially induces changes in the human development index at a municipal level. In this case it can be defined as "logical" because the calculation of the MHDI is based on education, health and income.

For this reason, our focus was not to discover a scientific rule but to concentrate on the level of association between the income per capita and the human development (measured as Municipal Human Development Index, MHDI) throughout the Spearman's correlation index ρ (rho), namely a co-graduation index applied on ordered

values^{§§} in order to recognise the extent to which the income per capita has a role in explaining the MHD^{***} (Hauke, Kossowsky, 2011). The graph clearly indicates that even when very low, the association is always positive ($0 < \rho < 1$). This positive correlation increases each year for every group. M1 shows the lowest association, while M2 and M3 show a highly positive correlation (already in 1991), presenting similar variations throughout the years. The association mentioned above decreases if we are to consider the total sample ($n = 27$). (Figure 3).

Fig. 3. Spearman's co-graduation index ρ (rho)



Source: Personal elaboration from PNUD-IPEA-FJP, 2017

It can be concluded that the index of co-graduation in 2010 is high and almost homogeneous for all subgroups, with $\rho > 0.80$ in all cases. This indicates that the role of per capita income, though not the only determinant of development, is gaining an increasingly decisive role. However, its role remains the smallest in the area with the worst distribution of income (M1) which is in turn the most exposed to the negative effects of the national intervention in the exploitation of local natural resources (i.e. downstream effect of the Tucuruí hydroelectric plant).

Conclusions

A trade-off between national growth and human development clearly exists and is particularly severe for emerging countries which are also perceived to hold the greatest pollutant potential and the highest likelihood to shift from a dirty to clean development paradigm. Renewable energies increase as they become progressively considered as the best solution for combining development achievements whilst preserving ecosystem services.

^{§§} We must first order the values of all municipalities on a scale from 1 to 27 ($n=27$) in order to calculate the total Spearman's index. We then re-calculate the rankings within each group, on the basis of different scales (i.e. $n=8$ for M1, $n=7$ for M2 and $n=11$ for M3), to calculate the target group's Spearman indexes (Total Spearman index does not change).

^{***} That is to say how much the error in predicting the rank of a municipality with regards to MHD^I can be reduced if we take into account the rank of the same unit with regards to income per capita. The index has a value between 1 and -1: $\rho = 1$ the units have the same rank in both rankings; $\rho = 0$ the two rankings have no association; $\rho = -1$ units never have the same rank in both rankings.

However in Brazil's case, though the Amazon has a great mining and hydroelectric potential and as is generally the case with natural resources, the uneven distribution of benefits and costs from its exploitation affects the energy strategy and the development of the region. In fact, the return on investment represents a true measure of a project's contribution to social welfare only if it is evaluated at its social-environmental opportunity cost (Costantini et al., 2016).

Therefore, the overall evaluation of the indicators mentioned above outlines the real holistic progress made in local contexts in Brazil, especially in cases of implementation of sector-based national programmes. This is an important starting point when dealing with the implementation of new strategies: if lessons are successfully learned from past experiences, the evaluation of future development proposals can be greatly improved to allow for policy makers to be better informed in their investment decisions.

The Gini index is the only indicator in which target groups register worse results than both the country and the state. This is highly indicative of the development model of sector-based projects: though they assure a great influx of capitals, the lack of adequate structural policies means that they merely contribute to national economic growth whilst overlooking the human development in affected areas (Caravaggio and Iorio, 2015).

We therefore propose to provide knowledge in order to aid the reviewing of the country's development agenda. Alongside the integrated process of national growth and throughout the combined struggle against poverty and inequality as instruments for a balanced development, we propose a medium-to-long term objective of overcoming the Amazon's current categorisation as "Brazil's backyard" (Pinto, 2017) in favor of a dual development strategy based on the exploitation-conservation of resources and territory, so as to ensure a sustainable national growth and regional integration (Magalhaes, 1987).

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INNOVATION ACTIVITIES OF GAZELLES IN BUSINESS SERVICES AS A FACTOR OF SUSTAINABLE GROWTH IN THE SLOVAK REPUBLIC*

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Abstract. Gazelles create greater share of new jobs in comparison with other businesses operating on the market. These are young businesses of various sizes, but mainly small businesses. They generate a high rate of growth of production within a short time, which is based on the use of innovation, they are also the bearers of innovation. They are characterized by effective use of creativity and human resource capacities. They may be found in all sectors of economy, but to the greatest extent in the services sector and within that sector mainly in business services characterized by high knowledge intensity, high dynamics and continuous growth in employment. Gazelles of business services in the Slovak Republic intensively use all types of innovation. Management ability to optimize innovative processes according to needs of the enterprise seems to be of importance. Human resources and performance is considered to be the most important area of innovation influence. With its innovative activity they act as the accelerator of economy and changes in the thinking and culture of both enterprises, as well as the whole company toward sustainable growth.

Keywords: innovation, gazelles, fast-growing companies, business services, knowledge-intensive services, performances, sustainable growth

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1. Introduction

Young, rapidly growing businesses called gazelles form a significant subset of entrepreneurial entities with high growth (Eurostat-OECD, 2007; OECD, 2012; Krošláková et al., 2015). The fast-growing companies reach more than a 20% revenues or employment increase during the period of three consecutive years, but their age from the establishment does not exceed five years (Ahmad, 2006; Eurostat-OECD, 2007; OECD, 2015).

Statement that small and medium-sized enterprises create jobs was mentioned for the first time by David Birch in his work (1979). Birch assumed that new jobs are created mainly in small and medium-sized enterprises, in particular in those newly established. Birch examined this hypothesis with his team (1997) in the US, and found that on average two thirds of all jobs are created by small and medium-sized enterprises. Other authors (Birch et al, 1997; Moreno, Casillas, 2000; 2007) define gazelles as companies which are able to generate high growth rates in very short time periods. According to Eric P. Canab (1998), gazelle is a company, which is experiencing an extended period of rapid growth.

Australian research of the environment of fast-growing companies – gazelles – focused on identifying differences and specifics operating at the stage of establishment in enterprises – gazelles and in enterprises – non-gazelles (Cunneen and Meredith 2007). Results show the ability of gazelles to risk, to act independently, intuitively and aggressively in the competition, while being able to benefit from networking. On the other hand, they are concentrated on the support of human resources quality and creativity development.

Gazelles bring new products to the market and they are looking for new markets. They focus on the efficiency of production and business processes, they use advanced information technologies, employ skilled workers, have experienced management and successfully established themselves in the global market. (Barnard et al., 1998). Most of them are companies that are the pioneers in structural changes in their field and have a developed corporate culture based in particular on innovations and search for new opportunities for asserting themselves on the market, or on the growth of market share. They introduce mainly new ideas and innovation in their processes, therefore it may be presumed that these companies could be the biggest innovators in the market (Stone and Badawy 2011). The ability to promote innovation is a more important factor of growth in the case of these enterprises than their small size (Henrekson and Johanson 2010). Under Stone and Badawy (2011), it is possible to combine a beginning firm and a gazelle, because the company, which fills the gap in the market through innovation, has a huge projection of further growth. Gazelles exist in all sectors, primarily in services (Henrekson, Johanson 2010). They focus mainly on knowledge production, science and research (OECD, 2013), which is characteristic for sub-sector of business services. Experts agree that many enterprises of business services were founded as quickly growing businesses or gazelles. Therefore the aim of the article was to identify the importance of using intangible assets by enterprises of business services, to find out the innovative ability of gazelles of business services operating on the market in the Slovak Republic, the impact of introduced innovations on their business activities, as well as the socio-economic contribution to sustainable growth.

2. Literature Review

Knowledge production of business services. The most dynamic and the most productive small and medium-sized enterprises belonging into the services sector are services demanding on knowledge (knowledge-intensive services – KIS). Diffusion of knowledge production in the processes of other enterprises supports the growth and competitiveness of the whole economy. As producers or providers of new knowledge they strengthen the innovative processes in manufacturing and service enterprises, their activity, therefore, goes beyond the borders of the service sector.

Several foreign and domestic authors addressed the characteristics of knowledge-intensive services in the last decade, among them Wolfl, Bryson, Daniels, Andersen, Miles, Haataja, Okkonen, and others. For example, according to Haataja and Okkonena (2004) knowledge-intensive services are characterized by the following: knowledge is highly valued and has a strong position as the input source, it is primarily based on professional skills, it is source of knowledge for its users or it is used as input in order to develop knowledge of its clients, between the client and the supplier. When the knowledge is generated and passed on, there is an intensive interaction.

Many studies associate KIS not only with productivity growth in other enterprises, but also indicate that they have common characteristics with manufacture based on high technology (High technology Manufacturing) (Ortega-Argilés et al., 2009). Production and service enterprises of KIS show many common signs, in particular, in their innovation processes, such as the interaction with suppliers and in innovation intensity. (De Jong and Marsili 2006).

Externalization process, taking place in the economies in the last few decades, separated several activities as information and computer services, legal, accounting, marketing, personnel services and others from large enterprises. Independent entities were thus created that established themselves on the market, as closely specialised small and medium-sized enterprises called business services. Production of vast majority of them is based on knowledge, and thus in general they are knowledge-intensive. In practice, there are as many types of knowledge-intensive business services (KIBS) as there is a lot of knowledge, so naturally there is a great diversity between their development, structure and purpose.

According to Miles et al. (1995) these are services, the result of which is the creation, accumulation or dissemination of knowledge. They are based on professional skills, they are primary sources of information, and make up new knowledge provided to their customers, and their production brings a competitive advantage and is mainly directed at enterprises. Toivonen (2004) also claims that these services are provided by enterprises for other enterprises or the public sector, where professionalism plays a particularly important role. Also other authors, such as Koch and Strotmann (2008) state similarly ... "these are highly application-oriented services where knowledge plays an important role." ... "KIBS are largely based on professional knowledge, they are closely specialised in the field, their output is an intermediate product, not the final product" (Hertog, 2000).

In view of the fact that they provide services of intangible nature, a high degree of interaction is necessary and adaptation of their individual needs, which requires close and intensive cooperation with customer's company. Without the cooperation of the customer with the KIBS enterprise, it is not possible to obtain the so-called "hidden" knowledge about customer's company, which is an essential element in the creation of provided human service.

Many authors highlight not only the dependence between KIBS, innovation and the performance of the whole economy (e.g. Hipp, 1999; Tomlinson, 1999; Aslesen and Isaksen, 2007), but also connection of innovative activities, knowledge mediated by KIBS with industry, science and customers (Czarnitzki and Spielkamp, 2003, Drieniková and Kašáková 2016).

It may be summarized that the knowledge-intensive services of business services are characterised by high knowledge intensity and a relatively high capital and innovative intensity, high degree of specialisation and interaction. Their production is directed mainly at intermediate consumption, their activity consists in providing knowledge and skills to other enterprises.

Innovation as a factor of dynamic and sustainable economic growth. Systematization of knowledge on business determinants of growth, in particular from the knowledge-based company, confirms significance of innovations for the economic growth of enterprises and rapidly growing firms, gazelles included. Innovation effect, however, may vary due to heterogeneity of enterprises and typology innovation. Of course, these are affected by a range of factors from the internal business environment, as well as from the external environment.

Small companies show higher growth potential, as is the average, but growth is conditional upon the ability to gain external sources of financing and access to foreign markets (Becchetti, Trovato, 2002). A research of 407 Swedish small and medium-sized enterprises was conducted in the years 2006 – 2009, while the enterprises were differentiated according to the achieved economic growth. It has been demonstrated that enterprises with a high growth achieve a higher profitability, increased the number of employees and have experienced higher market share on the local, national and international markets in comparison with the companies with low growth. The result was accompanied by the following significant element: higher share of new products to the achieved sales (Grundström et al., 2012). Focus on innovation is considered to be the crucial element of growth strategy of market leaders by the author Laforet (2010). Within the meaning of innovation impact on the economic growth, it is necessary to add considerations on diversity of impact of the various types of innovation on business growth. If product innovations give rise to an increase in the number of personnel, process innovations have an adverse effect, which is manifested by reducing human labour per unit of output.

Performed studies have shown that high investments in research and development and high innovation level may not lead to an increase in their profits, but that the fast-growing companies tend to be more innovative (Coad, 2009; Storey, Greene, 2010). Instead of expensive and risky scientific-research projects, small and medium-sized enterprises should focus on the development of products and markets, keep an up-to-date knowledge of new technologies and competition, as well as be able to expand their own customer base. In order to achieve a long-term sustainable growth this may be implemented by either introducing new products to an existing market, or by acquisition of new markets by placing existing products (Dobbs, Hamilton, 2007; Bessant, Tidd, 2011). However, enterprises are more focused on product than process innovation (Coad, 2009; Bessant, Tidd, 2011) and specialise in technological expertise, the product range with the aim of closing the market gaps (Bessant, Tidd, 2011). The type of innovation introduced by the company is not so crucial. Raymond and St-Pierre (2010) confirmed that even if innovation of products and processes are often examined separately as completely different, these two types of innovation are connected during the implementation of the innovation process into the enterprise value chain (Fuller, Matzler, 2007).

Innovation and development of products are more formalised in large enterprises (Cooper, Kleinschmidt, 1995), while in the environment of small and medium-sized enterprises they affect the whole corporate structure (Strerlacchini, 1999). Small enterprises usually use one of the forms of open innovation, which may vary in the light of the degree of cooperation, in particular if the enterprise does not have enough internal resources for innovation or its management. The extent of openness depends on with whom the enterprise cooperates. Openness is defined either by supply absorption capacity (*inside-out*), or consumer absorption capacity (*outside-in*) (Newey, 2010). It is likely that enterprises with market orientation grow faster, because they are able to expand their products. (Verhees, Meulenbergh, 2004; Capelleras, Greene, 2008).

Mason (2009) states that innovative enterprises grow twice as fast as compared with companies that hardly innovate. The characteristics of the most rapidly growing firms in Scotland equal to orientation on knowledge and innovation. The author states that the functional attributes of fast-growing companies are high quality production outputs, knowledge of workers about the market and consumers, and a high level of internationalisation. Positive and significant association with productivity is also mentioned by further studies, according to which companies with more intangible assets have a higher precondition to achieve higher productivity. At the heart of these studies

are: expenditure on research and development and progressive technologies and equipment, management procedures, corporate strategies, the talent of managers, information technology, employees, quality, product innovation, organizational structure, and the like.

Promoting innovation in services is determined by specific nature of services and factors shaping the offer of services. Key factors are the quality of human factor and the use of techniques and technologies, including the ICT. Rapid spread of the internet and mobile connection forced the marketing experts to focus on speed, planning and electronic access, and thereby accelerate the process of production or sale of services.

A critical moment in production of services is engagement of the client in the process of the provision of services and establishing a relationship with the customer. Also marketing and delivery of the service at the appropriate time is an important moment assessed by the customer. Establishing a relationship with the customer through the internet and mobile networks is a rapidly growing trend, progress in IT allows implementation of new technological innovations in services and supports creation of new ideas.

Several studies examined the strategic role of information technology (IT) in innovations. These have confirmed that IT significantly facilitate innovation of services in a number of sectors (such as health, financial services, technical services, in consulting, in the field of management) (Guo, Chao, 2014; Hilkevics, Hilkevica, 2017; Luhn et al., 2017). Froehle and Roth (2004) indicate five ways explaining diversity of contacts with the customer mediated by technology or a customer relationship in relation to technology. These support a range of relations between the provider and the client – from technology supporting direct contact with the customer to the self-service technology. However, accumulation of key components of the intangible assets is a long-term process in an environment of services, because they are based on the trust of the client to the company with a longer history and better reputation. Despite the multiple statements on positive impact of innovation on productivity and economic growth of service enterprises, there are also ambiguous or negative statements in different sources. Several studies (Brynjolfsson, 1993; Wilson, 1993, 1995) have shown that there is no relationship between information and communication technologies and the enterprise performance, here we speak of the so-called technological or information paradox. Solow (1987) stated that the computer age can be seen everywhere, but not in statistical evaluations of productivity.

Similar doubts can also be expressed in relation to another types of innovation (product, organizational, marketing). Generally, the innovative effects come with time-delay, especially in an environment of services production, which has an inseparable and intangible nature and consumption is based on experience or trust. Therefore, it is justified that the positive impact of innovations on performance and economic growth is difficult to identify.

2. Methods

Meeting of the specified objective has been achieved through scientific methods, namely analysis of secondary sources, synthesis of relevant findings and subsequent induction in order to establish the innovative capacity of gazelles of business services in the Slovak Republic. Verifying the impact of innovations introduced in the business processes of the gazelles of business services was carried out by the questionnaire. Statistical and mathematical methods of correlation and regression analysis in Excel and Gretl were used to determine the productivity and employment in business services. In order to achieve the objective, we have set 1 hypothesis and 4 research questions, which are answered in the part Results and discussion.

The secondary research was based on the study and processing of domestic and foreign theoretical and statistical sources, as well as research studies, in particular in the databases ProQuest, Ebsco Host, Scopus, Web of Knowledge, OECD, Eurostat, Statistical Office of the Slovak Republic.

The dependence of selected factors of economic growth was expressed by means of the correlation coefficient – Pearson correlation coefficient (r) and the chart of dependencies was used for illustration of results. The determination coefficient (r^2) served for the evaluation of variability of the estimated linear regression model. We were interested in the equation of regression line in case of the regression method, which is as follows (1):

$$\hat{y} = b_0 + b_1X \quad (1)$$

The Power indicator productivity (gross value added per employee) is in the position of independent variable (x) and employment acts as dependent variable (y). Service enterprises were the object of examination under the NACE rev. classification 2 in the section J, L, M, N.

The primary research was conducted in the period 11/2015 – 03/2016 by means of an interview survey. Database of enterprises was generated from two statistical sources – the Statistical Office of the Slovak Republic and the company FinStat. Combination of these two sources has been chosen in order to reach the complexity of data conditioned by their availability. In 2015, the Statistical Office of the SR made the identification of gazelles in the Slovak Republic available for the first time, showing data from 2012 and 2013. Information on gazelles in the SR for the year 2014 have been supplemented from the database of FinStat company. During the observed three-year period, 342 gazelles in total have been identified within the Slovak economy of Slovakia – in the services sector. Section M Professional, scientific and technical activities was represented by 22% share, Section J Information and communication was represented by 12% share and Section N Administrative and support services by 3% share. Initial database of enterprises was made of the group of KIBS enterprises (NACE rev. 2 J 62 Computer programming, consultancy and related services, J 63 Information Services, M 70 Company management, consultancy in the field of management, M 72 Scientific research and development, M73 Advertising and market research) meeting the criteria of gazelles, with the total number of 112 enterprises.

Intensity of introduced innovation impact in business services is expressed as a weighted arithmetic mean of individual business response values in the primary research, using the Likert scale, scoring 0-3 (0 – no impact, 1 – slight impact, 2 – significant impact, 3 – very significant impact). The value interval of individual elements intensity (specified effects) in the enterprises was 0;3.

3. Results and discussion

Hypothesis 1 Productivity growth has no effect on employment growth in the Slovak business services.

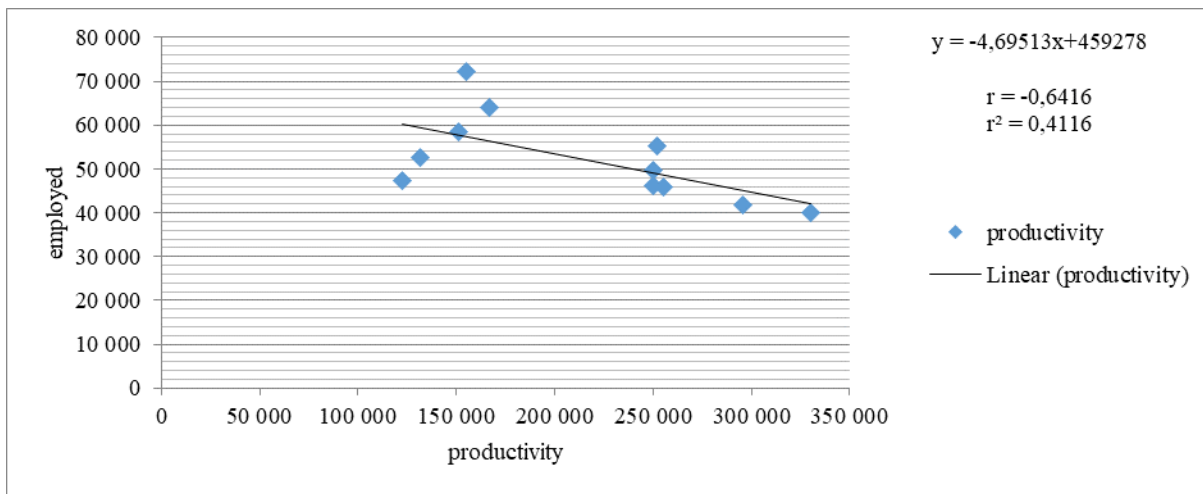


Fig. 1. The relationship of productivity growth and employment in business services in the Slovak Republic in the years 2005 – 2015
Source: Own processing according to Eurostat data

Based on correlation analysis ($r -0,6416$) and regression analysis ($r^2 0,4116$) we are adopting hypothesis 1 (Figure 1). There is a moderately strong indirect linear dependency between productivity growth and employment in business services. This means that if productivity in enterprises of business services rises, the number of workers must not. Even though there was a continuous growth of employment and performances measured by volume of gross added value (see Figure 2) in the sub-sector of business services in the last decade, the analysis confirmed significant importance of using the capacity of available human resources, as well as intangible assets, such as innovations and ICT.

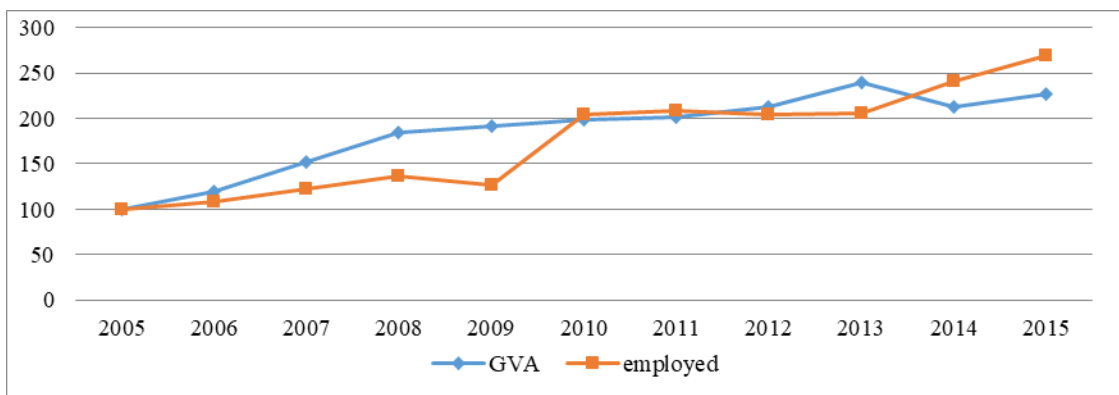


Fig. 2. Development of gross added value and employment in business services in the Slovak Republic in the years 2005-2015 (in %, 2005 = 100%)
Source: Own processing according to Eurostat data

Research Question 1: Which sector of economy has the most gazelles in selected countries and in the Slovak Republic?

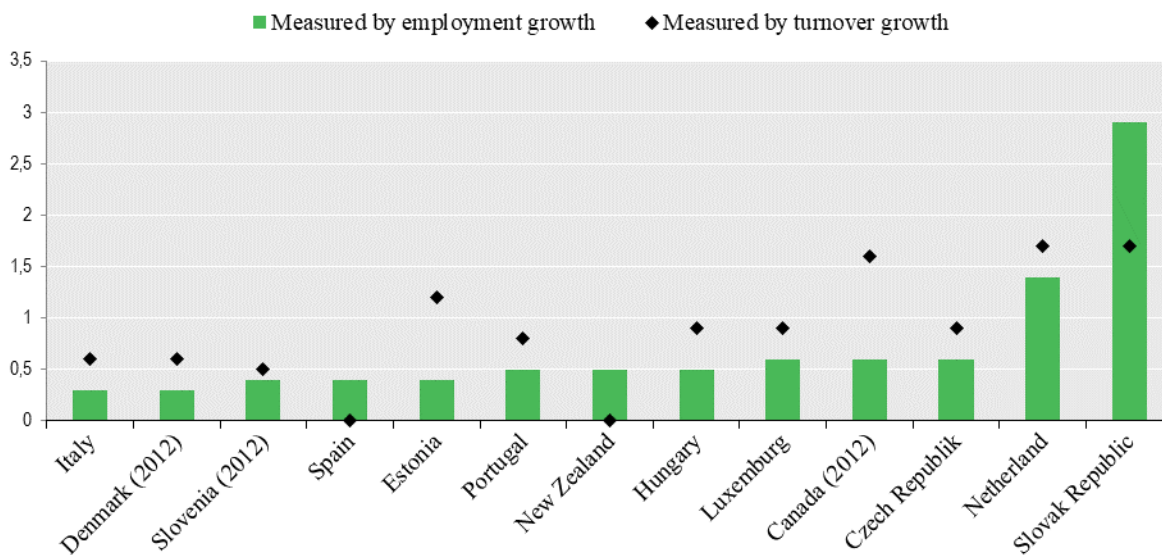


Fig. 3. The share of gazelles in the number of enterprises with 10 and more employees according to the criterion of increase in turnover and employment in selected OECD countries in 2013 (%)
Source: Own processing according to OECD data, 2015.

The most important share in the total number of enterprises was reached by the gazelles in Slovakia (2.9%) and the Netherlands (1.4%) according to the employment increase indicator. Gazelles in Denmark and Italy had the lowest representation (0.3%) (Figure 3). According to the indicator of turnover increase, the share of gazelle representation in all observed countries is higher. Slovak and Dutch gazelles also had the highest share (1.7%) in this assessment, the lowest representation of gazelles was again recorded by Denmark and Italy (0.6%) (Figure 4).

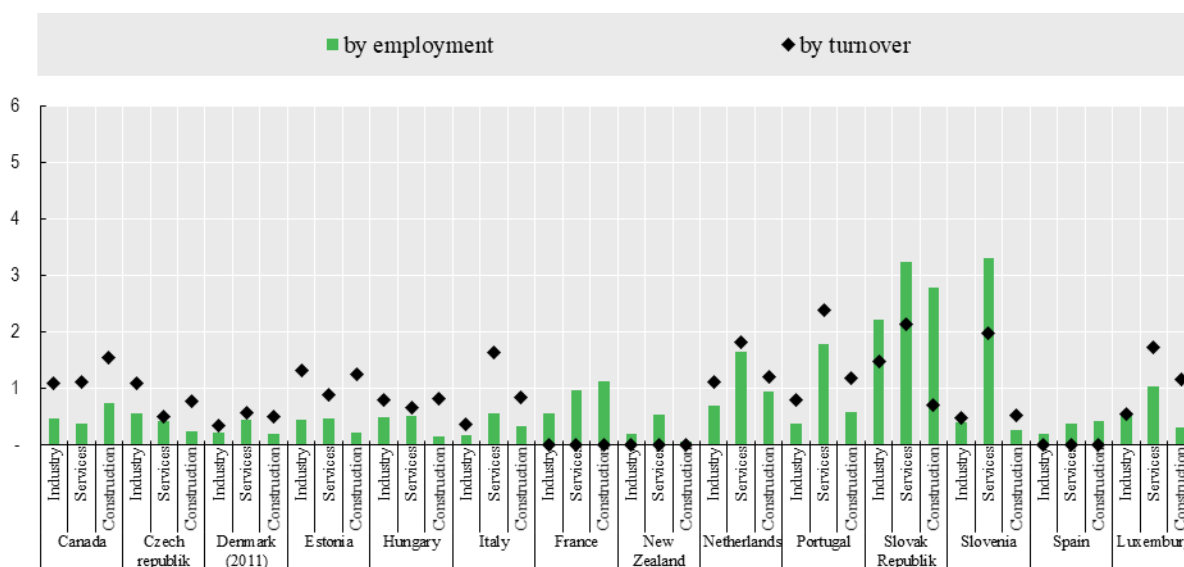


Fig. 4. The share of gazelles in the number of enterprises with 10 or more employees in the various sectors of economy according to the criterion of increase in turnover and employment in selected OECD countries in 2013 (%)

Source: Own processing according to OECD data, 2015.

Gazelles in the Slovak Republic thus form an above average share in the group of all active enterprises with 10 and more employees within economy. Their participation in different sectors (construction, industry, services) is higher than the average of selected countries. Based on the observation of sectoral structure of Slovak gazelles, we can say that these are characterised by dominant existence in the services sector according to both criteria – increase in turnover and employment (2.14%, 3.23%).

Research Question 2: Does innovation affect the economic growth of gazelles of business services?

Table 1. Innovation influence upon the growth of turnover/employment in gazelles of business services in the SR

	Gazelles of business services
Yes	50.0%
No	2.8%
Not able to judge	47.2%

Source: Own research, 2016.

Gazelles are aware of the innovation effects upon their economic growth (Table 1). The fact of low involvement can be described as problematic and subsequently also the state of knowledge on innovation effects in gazelle managements of business services, when businesses cannot assess the impact of innovation on their growth. Enterprises of business services have rejected the link between innovation and economic growth only in 2.8 %. A relatively high value achieved in the option "not able to judge" indicates a relatively weak initiative of business managements to analyse the benefits of innovation. Taking into account the criterion of geographical origin of enterprises brought the knowledge of the highest awareness of economic benefits of innovation in foreign gazelles of business services.

Research Question 3: Application of which innovation is the most frequent?

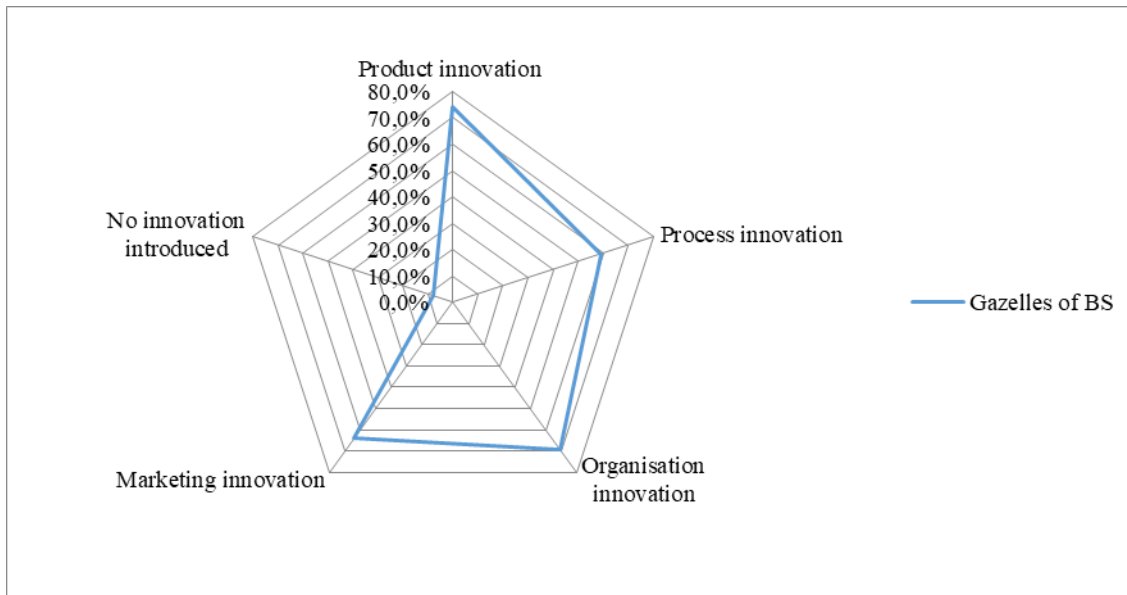


Fig. 5. Application of innovation in gazelles of business services in the Slovak Republic

Source: Own research, 2016.

For all types of innovation, the situation is very similar, as most gazelles of business services introduce the non-technological, as well as technological innovation (Figure 5). The presumption of priority use of non-technological innovation in gazelles of business services in connection with the statements on the application of innovation in services was not confirmed. Technological innovations are a used source of gazelle's growth, in foreign enterprises in full extent (100% of enterprises), all the observed foreign gazelles introduced process innovations.

As far as possible, the gazelles of business services focus on product innovation (74.4 %). This result is influenced by individual nature of production according to the specific needs and tasks of clients (consultancy, research, etc.). On the basis of that it can be concluded that more divisions of business services carry out an estimated number of product innovations, than the number of tasks from clients. Priority type of product innovation for gazelles of business services are innovations partly or totally new for the company.

Gazelles of business services having a high knowledge intensity, high degree of team work, production requiring interactivity with customers are implemented by IT in particular in internal business processes. This results from the need to optimize team cooperation and the exchange of information between employees, exchange of documents with suppliers and customers. Therefore more than 40% of gazelles of business services introduced a mobile employee access to information systems of the enterprise, one half implemented a CRM system for analytical and marketing purposes, and the electronic exchange of documents with suppliers is used by a quarter of gazelles of business services.

Individual and specialised nature of production of business services determines the strong concentration on organizational innovation, which were introduced by gazelles of business services within the extent of 69.2 %. In this context, it is important that the products of business services are the result of knowledge-intensive production, they are implemented through projects and frequent product innovation requires changes of competences and performance of workers. The workers are tasked with the requirement of flexibility in work assignments and

performances. Gazelles of business services innovate intensively in areas such as outsourcing, redesign of jobs, IT skills, cooperation with enterprises and universities.

The most often used type of introduced marketing innovation in all observed gazelles is social marketing, direct marketing (e-mail marketing, multi-channel communication with customers), but also experiential marketing (event marketing); also the organisation of conferences, seminars and workshops. As a consequence of knowledge production of observed gazelles toward the intermediate consumption, a higher frequency of marketing focused on professional target customer segment was established.

Research Question 4: Which areas are most intensively affected by innovation?

Table 2. Intensity of implemented innovations impact in gazelles of BS in the SR.

Effects of innovations	Gazelles of business services (%)
Increased revenue from sales	14.25
New clients	16.25
Popularity, good name of enterprise	14.00
Increased customer satisfaction	13.75
Integrated customer information	10.25
Creating long-term relationship with customers	12.50
Customizing the offer to the customer	12.25
Satisfaction of employees	11.50
Employee loyalty	5.25
Overview of business flows	7.50
New partners	6.75
Entry into the scientific-research project	6.25
Greater efficiency of work – productivity	11.75
Obtaining a quality certification	2.00
Reduction of environmental burden	1.25
Formation of scientific-research unit	3.75

Source: Own research, 2016.

Intensity of introduced innovation impact in services enterprises is expressed as weighted average of individual values of enterprise responses. Maximum values of innovation intensity impact can be monitored in the areas of employees, customers and performances (Table 2).

Gazelles of business services present the most significant impact of innovations in the following areas: new clients, increased revenues from sales, increased customer satisfaction and long-term relationship with customers, tailor-made customer offers, higher labour efficiency, employee satisfaction, and integrated customer information.

Conclusions

Gazelles do not only bring innovation, but their growth of production is based on the ability to promote innovation and also the effective use of human resources and their creativity. Research results show that the most important share of the total number of enterprises in the observed countries according to the indicator of employment and revenues increase were reached by gazelles in Slovakia. Based on the observation of sectoral structure of Slovak gazelles, we can say that these are marked by dominant existence in the services sector (app. 70 %). Business services have an important position in the services sector and within them the knowledge-intensive business services linking knowledge and innovation with performance of economy and employment

growth. Their production, as well as production of gazelles of business services is a source of sustainability in the whole economy.

Gazelles of business services in Slovakia are to a large extent technological, as well as non-technological innovations, most of them (93%) apply at least one type of innovation. All gazelles of foreign origin introduced technological innovation into the business activities of the enterprise, and process innovations to the full extent. This confirmed the importance of an effective use of available human resources, as well as intangible assets in business services, such as ICT. The presumption that service enterprises use as a priority technological innovations was therefore not confirmed.

The results of research, however, show a poor initiative or ability of management of Slovak gazelle within business services to identify the innovation influence on their performance and employment. There is a different situation with foreign gazelles of business services operating in the Slovak market, most of them have expressed a positive effect of innovation on the economic growth of their enterprise. From the aspect of innovation impact on business processes, gazelles emphasized the areas of human resources (staff, customers) and performances. The result shows the significant importance of the business ability to introduce innovation in an optimal way and to prepare stimulating innovative environment. Management of innovations can thus be described as a decisive factor for innovation success expressed by innovation effects.

Innovation activity of gazelles of business services in the Slovak Republic, however, does not primarily only bring the current economic benefits generated by the economic force of these entities. Relevant facts in the area of their social and economic impacts are the facts that are tied to their emergence and that document a unique business plan, new links, innovative solutions and the ability to take risks. These new enterprises with a high economic growth create demand for innovative products in the local economy generated by innovation of their production. They thus create the business environment toward innovations, lay new requirements on the labour force and change clients' expectations. They put pressure on the whole value chain in the local economy toward the acceptance of innovations. Besides creating new jobs and economic benefits, the main social significance of gazelles is clearly their contribution to the change of enterprise philosophy and the society as a whole toward sustainable growth.

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INDUSTRIAL COOPERATION AND ITS INFLUENCE ON SUSTAINABLE ECONOMIC GROWTH

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Abstract. The stability of economic development is determined by the features of the network structure in collaborative engagement of enterprises. Industrial cooperation is just one part of that process; it differs in spatial coverage and range of activity. The complexity of taking into account the synergistic effect that arises in this case stresses the importance of this question from the theoretical and practical points of view. For this purpose, the paper considers the essence of industrial cooperation, some approaches to agglomerative tendencies and conceptual visions of cooperation from the standpoint of institutional theory. The investigation of the influence of cooperation on economic growth is based on several hypotheses. The first one is about the positive correlation between the studied parameters; the second one is about the fact that protection of institutional property rights is an important factor in cooperation development. These theories have been studied within the frame of loglinear model using the table of data about 20 European countries for the forecast period of 2017-2021. The results show that the mature system of industrial cooperation allows providing an additional economic growth at the level of 2.3-3.0%. It is also important to conclude that cooperation enhances the factor impact of the usual determinants of economic growth (working labor, capital and export). The model also takes into account some other possible determinants of economic growth such as expenses on research and development, use of a right of intellectual property and the Index of Economic Freedom. At the same time, a lax regulation in the sphere of property rights protection can become an incentive for co-operators. These and some other provisions determine the ways of enhancing of activity of enterprises for their close collaboration; it is emphasized that the development of co-operational relations has a great impact on competitiveness and sustainability.

Keywords: industrial cooperation, determinants of economic growth, integrated entities, effects of cooperation, sustainable economic growth

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1. Introduction

One of the basic conditions of progressive advance is integrating efforts of a lot of economic agents. The sustainability of an enterprise is determined by the set of its inherent resources, the degree of effectiveness of their use and good conditions for production cooperation with other industrial enterprises of the region or industry. Cooperative interaction compensates for the lack of certain resources in a particular enterprise due to their redistribution, which ensures the continuity of the reproduction cycle (Petrishcheva, 2011; Zheng, & Possel-Dölken, 2002; Bonin, & Putterman, 2013; Restakis, 2010; Ignatavičius et al., 2015; Prause, Atari, 2017). The development of cooperation is historically conditioned by the natural process of growth of the social division of labor. The new factors of industrial cooperation arise, first of all, under the influence of profound changes in the very process of production and globalization. Traditionally, with the cooperation of industrial enterprises, the task is to maximize the effective use of the potential of each of the industries in terms of specialization and a unique set of competencies. The development of co-operation, as well as the growth of specialization, concentration and combination of production, confirms the intensification of the process of their socialization. Increasing competition impels the subjects of the economy to search for more stable forms of cooperation, stimulates the emergence of integration entities that differ in the ways of interconnection and management. In this connection, it is reasonable to stimulate progressive mechanisms of production cooperation.

The principle of integration of science, education and industry creates a solid foundation for the development of sustainable cooperation of companies. At the present stage of the functioning of economic systems, it is impossible to consider industrial cooperation as a strictly intra-economic process. It is important to understand that such cooperation extends both to production itself and to activities that precede or follow it (Obecný, & Sanders, 2017; Kozma, 1982). Despite the fact that cooperation primarily focuses on achieving the end result, it is necessary to use an integrated approach and take into account the practical aspects of cooperation.

As researchers note, many sectoral and regional entities formed like this are experiencing problems. These problems include, among others, the low efficiency of the activities of integration entities (Yin, 2016); the need for their reorganization and, in some cases, changing the form of ownership (Paprzycki, 2005; Kuroiwa, 2012) (it seems that it is the institutional protection of property rights that is a significant factor in the development of cooperation; we are going to try to confirm this hypothesis later in the course of the study), as well as the risk of disintegration of the interfirm structure, which as a result may lead to a change in the configuration of industrial complexes (Haller, 2008). As a key reason for these problems, one can consider the random principle of forming the composition of integrated entities, the lack of justification for their territorial binding and the solution of predominantly auxiliary transaction tasks instead of the main transformational ones. All this leads to the need for a detailed study of the phenomenon of industrial cooperation and determining the degree of its impact on the region's sustainable economic growth.

2. Literature review

There are many debates on the essence and content of cooperation in modern economic science. The consideration of the problem initially involves studying the fundamental theory of the cooperative system. We can find in the literature the term “co-operation of production” or “production co-operation”. In our opinion, co-operation and cooperation are related concepts. So, co-operation is a dynamic process of interaction of enterprises based on their key competence for the production and sale of products or services. Co-operation is also understood as planned-organized production links between enterprises (Akhtaryev, 2010). As a consequence of the development of specialization, production co-operation is characterized by a relative constancy and stability of

ties (Berg *et al.*, 2017), strict observance of technical conditions (De Groot, & Plantinga, 1992). In its essence, the concept is linked with the term of cooperation as a form of long and stable ties between enterprises of the same profile that are located in different regions and jointly produce certain products. Co-operation of production can also be defined as a form of long-term production links between specialized enterprises or their associations (Bilorus, & Bilorus, 1990). A number of researchers focus on the characteristics of independence (autonomy of decision-making without taking into account the sign of a single title of ownership) and the targeting of products (Shevchenko, & Savinova, 2009). As a result, the most important features of industrial cooperation are (Rodina, 1990): (1) long-term economic ties; (2) joint or technologically related activities; (3) savings from specialization effects and increased labor productivity; (4) improvement and optimization of the production cycle.

It is necessary to distinguish two interrelated trends in industrial cooperation. Firstly, it is a form of management related to the production process, since the obligations of the participants in the cooperation, although they are delineated, are aimed at the production of a certain product. Secondly, cooperation also provides for the exchange between co-operators of products and services produced. Thus, industrial cooperation includes both the actual production process and the exchange of resources necessary for the production process (information, experience in marketing and management, technology, etc.). A cooperative network form of interaction unites several companies into a single structure that enhances their competitive advantages (Nikulina, & Kuznetsov, 2016). Intercompany cooperation compensates for the lack of certain resources at a particular enterprise due to their redistribution (Gomes-Casseres *et al.*, 2006; Glaister, & Buckley, 1996; Adams, & Marcu, 2004), which ensures the continuity of the reproductive economic cycle.

Approaches to the formation of integration associations are diverse. We can single out a *technological approach*, which involves the unification of enterprises along the technological chain (at the same time, technological compatibility and specificity of assets are assessed) (Soboleva, 2007); as well as a *situational approach* – the main goal of the formation of a large structure is the survival, preservation of enterprises (Semenov, 2011). At the same time, the strategic prospects for interregional cooperation largely stem from the trends in the development of industrial cooperation at local levels. Practice shows that effective cooperation in modern business conditions determines the importance of a functional approach to the formation and improvement of the work of organizational management structures (Soboleva, 2007; Batkovskiy *et al.*, 2017).

The degree of effectiveness of industrial cooperation is significantly influenced by environmental conditions (market conditions, degree of competitiveness, sectoral entry and exit barriers, and freedom of movement of capital and resources, access to information) that are expressed in institutional security (Obecný, & Sanders, 2017).

Institutional and neoinstitutional economic theory allows us to consider industrial cooperation as one of the states of a possible equilibrium of economic agents in the process of market interaction (from the standpoint of game theory, where there are four fundamental problems – coordination, compatibility, cooperation and justice) and as an instrument to reduce the level of transaction costs (Bulatov, 2010a). The consideration of industrial cooperation only in the vein of neoclassical economic theory is insufficient, especially in understanding it in the broad sense, as a kind of institution.

Considering the above, we have defined production cooperation as a system of economic relations between business entities for the realization of a full or partial production cycle in order to optimize costs and increase the competitiveness of each of the participants. Considering the object of industrial cooperation, it is advisable to address the issue of evaluating cooperative network links and analyzing the impact of cooperation on economic growth through institutional parameters.

3. Methods and Data

The main hypothesis of the study is that the institutional protection of property rights is a significant factor in the development of cooperation. Based on this theoretical concept, we focus on the impact of such an institutional variable as the level of state regulation in the field of protection of property rights. To do this, we are going to investigate the cause and effect relationship between the protection of property rights and the development of an industrial strategy of companies for 20 European countries for the period of 2017-2021 (the choice between adherence to autonomy or integration and cooperation), and to determine the degree of systemic influence on growth of cooperative activity for a number of countries for the forecast period of 5 years. The predicted values of the initial model parameters are obtained by the regression method (based on the data of Eurostat and CECOP-CICOPA Europe is the European Confederation of Industrial and Service Cooperatives).

The evaluation of cooperative links is carried out on the basis of a logarithmic linear model through the correlation of economic growth (GDP) in logarithms for each of 20 countries in the corresponding year t to the following factors – capital (K_{it}) in logarithms, which we define as gross capital formation; labor force (L_{it}) in logarithms, which we define as the number of employees; export of goods and services (EXP_{it}) in logarithms; import of goods and services (IMP_{it}) in logarithms; foreign direct investment (FDI_{it}) in logarithms; cooperative variable as the number of co-operators ($FRAN_1_{it}$) in logarithms (Table A of the annex); and alternatively, as the number of enterprises in the cooperative sector ($FRAN_2_{it}$), in the logarithms (Table B of the annex).

We use the log-linear specification of the model through the equation:

$$FRAN_{it} = a_1 INSTITUT_{it} + c_i + u_{it} \quad (1)$$

where $FRAN_{it}$ is the cooperative activity in the country i in the year t in logarithms; $INSTITUT_{it}$ is an institutional variable of state regulation in the field of protection of property rights in the country i in the year t , in logarithms; c_i is unobservable fixed (by country) effect; u_{it} is an error.

To overcome various problems in the evaluation equation, we use the analysis of data with fixed-effect transformation to eliminate heterogeneity by country. As for other econometric problems in the assessment equation, endogeneity in particular, we believe that it is regulation in the protection of property rights that affects the expansion or reduction of industrial cooperation in the country.

The measurement of cooperative activities $FRAN_{it}$ is carried out through two alternative indicators:

- A. cooperation from the point of view of the cooperator – an indicator of the number of cooperative parameters in the country i in the year t in logarithms ($FRAN_1_{it}$);
- B. industrial cooperation from the point of view of the cooperator is an indicator of the number of cooperative productions in the country i in the year t in logarithms ($FRAN_2_{it}$).

The measurement of the institutional variable of state regulation in the field of protection of property rights $INSTITUT_{it}$ is carried out according to the following alternatives:

- A. the Index of Economic Freedom, which is published by the Heritage Foundation and the Wall Street Journal, in logarithms (IEF_{it});
- B. the International Property Right Index (the subindex of the Index of Economic Freedom, which is published by the Heritage Foundation and the Wall Street Journal) in logarithms (IPR_{it}).

The presence of the heterogeneity of the country c_i in the equation (1) means that $INSTITUT_{it}$ can correlate with such characteristics of the country as location and distance (by analogy with the gravitational theory). These equations have a causal interpretation; they model the effect of an exogenous change in $INSTITUT_{it}$, affecting the level of cooperative activity (when fixing factors in exogenous variables). We believe that our measurement of the institutional variable remains purely exogenous, as proved above.

Table 1. Correlation analysis of model parameters

Index	FRAN_1	FRAN_2	IEF	IPR	GDP	K	L	IMP	EXP	RD	ROY	FDI
FRAN_1	1.00											
FRAN_2	0.02	1.00										
IEF	0.26	0.08	1.00									
IPR	0.40	0.02	0.93	1.00								
GDP	0.85	0.09	0.50	0.57	1.00							
K	0.82	0.11	0.49	0.57	0.99	1.00						
L	0.78	0.09	0.05	0.14	0.81	0.80	1.00					
IMP	0.77	0.09	0.58	0.64	0.97	0.97	0.77	1.00				
EXP	0.73	0.09	0.61	0.68	0.95	0.95	0.74	0.99	1.00			
RD	0.21	0.07	0.67	0.77	0.42	0.44	0.05	0.49	0.55	1.00		
ROY	0.72	0.10	0.61	0.63	0.84	0.83	0.65	0.90	0.91	0.44	1.00	
FDI	0.49	0.10	0.50	0.52	0.65	0.67	0.51	0.75	0.76	0.37	0.78	1.00

Note:

IEF_{it} – index of economic freedom; IPR_{it} – property rights index; GDS_{it} – gross domestic product; K_{it} – capital; L_{it} – labor;

IMP_{it} – import of goods and services; EXP_{it} – export of goods and services; RD_{it} – expenses for research work;

ROY_{it} – payments for the use of intellectual property rights, royalties; FDI_{it} – foreign direct investment.

It is assumed that, compared to other usual key determinants of economic growth (Table 1) (capital, labor, foreign trade, foreign direct investment), the weight of industrial cooperation will be positive.

4. Results

The analysis of the obtained assessment data and the main tests of the model (Table 2) led to the conclusion that the level of state regulation in the field of protection of property rights has a positive impact on the cooperative activity of enterprises in European countries. This generally confirms our hypothesis about the presence of a causal effect if we consider the variable of cooperation in the meaning of the total number of co-operators. At the same time, the statistical significance in the specifications of model 1-3 is close to the minimum acceptable level of 10%. In Specification 4, when using the (IPR_{it}) with random effects, the coefficient of the property protection variable (at the level of 10%) becomes statistically significant (at the level of 10%) (0.537).

Table 2. The results of testing the FRAN_1 model – the method of least squares (OLS) with fixed and random effects

Index	1st specification	2nd specification	3rd specification	4th specification
	fixed effects		random effects	
	FRAN_1	FRAN_1	FRAN_1	FRAN_1
IEF	0.971 (1.31)		0.844 (1.30)	
IPR		0.568 (1.64)		0.537 * (1.91)
Constant	1.929 (0.62)	3.618 ** (2.48)	2.464 (0.90)	3.750 *** (3.13)
Number of observations	100	100	100	100
Number of countries	20	20	20	20

Notes: the absolute value of t-statistics in brackets; * – significance at the level of 10%; ** – significance at the level of 5%;

*** – significance at the level of 1%.

A weak statistical significance of the coefficients of the institutional variable, assessing its impact on the activities of industrial cooperation, can be explained, first, by imperfection of measuring the level of protection of property rights; secondly, the need to expand the number of observations by including more countries in the study and increasing the scope of the survey; thirdly, the effect of the influence of changes in state regulation on industrial cooperation in the same time period is ambiguous. The application of certain lagged values can help to understand the relationship between the protection of property rights and cooperative activities. These recommendations can serve as promising trends for further research about this problem.

Let us analyze the results of testing the influence of state regulation in the sphere of protection of property rights on the activities of industrial cooperation (Table 3) through the parameter of the number of enterprises in the cooperative sector.

Table 3. The results of testing the FRAN_2 model – the method of least squares (OLS) with fixed and random effects

Index	1st specification	2nd specification	3rd specification	4th specification
	fixed effects		random effects	
	FRAN_2	FRAN_2	FRAN_2	FRAN_2
IEF	-2.273 (0.43)		0.606 (0.48)	
IPR		-5.902** (2.47)		-0.029 (0.06)
Constant	19.192 (0.86)	34.466*** (3.43)	7.078 (1.33)	9.746*** (4.74)
Number of observations	82	82	82	82
Number of countries	20	20	20	20

Notes: the absolute value of t-statistics in brackets; * – significance at the level of 10%; ** – significance at the level of 5%; *** – significance at the level of 1%.

The test results indicate that the specification 2 of the model has a high statistical significance. This confirms our idea that the strengthening of state regulation in the field of protection of property rights (including intellectual property) can be inversely related to the growth in the number of companies that will be committed to cooperative activities. In other words, weak regulation in the field of protection of property rights can become a motivational incentive for cooperators to develop their activities, creating a greater number of cooperative enterprises.

A possible explanation for this result is that in a more liberal protection of property rights the risks of industrial cooperation (risks of liability for non-observance of rights) are generally reduced. A more severe responsibility, for example, for infringement of trademark rights may lead to more cautious behavior, and thus should restrain the development of enterprises in the field of industrial cooperation.

However, testing the specifications 1, 3 and 4 shows that the statistical significance of the model FRAN_2 is far from the minimum allowable value. The use of such an alternative measure of industrial cooperation as the number of enterprises participating in cooperative activities makes the coefficient of industrial cooperation statistically insignificant. This can be justified by imperfection of the measure of industrial cooperation in the number of enterprises participating in cooperative activities, or the problem in the data retrieval, which may serve as a subject for further research.

5. Discussion

Let us analyze the influence of industrial cooperation on the economic growth of 20 European countries of our series. To test this hypothesis, we apply an econometric analysis of table data with fixed effects. It is important to include all the key factors in the specification of the model that have a systemic impact on economic growth and which are inherent in the economies of countries from our series. Economic theory and empirical studies show that open economies grow faster than closed one due to liberalized foreign trade, attracting foreign investment, sharing of technological achievements and knowledge (Organisation for Economic Co-operation and Development, 2010; Van den Berg, & Lewer, 2015; Oosterbaan *et al.*, 2000; Carlberg, 1997). In a number of studies, the important role of institutions in promoting economic growth has been proved (Corkhill, 2002; Dawson, 1998; Vijayaraghavan, & Ward, 2001; Scully, 1988; Gwartney *et al.*, 2005). At the same time, to study the influence of political and economic factors of international economic integration on economic growth, it is necessary to take into account capital and labor as the basic factors of production according to the production function of Cobb-Douglas. Let us note once again that our idea is to have a positive correlation between the usual key determinants of economic growth (capital, labor, foreign trade, and foreign direct investment) and industrial cooperation.

In order to overcome the problem of the completeness of the model specification in the evaluation equation, we take into account other possible determinants of economic growth, such as research activities (research and development costs, RD_{it} in logarithms), payments for the use of intellectual property rights – royalties ROY_{it} , and the Index of Economic Freedom (IEF_{it}). The summary form of the equation of economic growth in this case is the following:

$$GDP_{it} = a_1 K_{it} + a_2 L_{it} + a_3 EXP_{it} + a_4 IMP_{it} + a_5 FDI_{it} + a_6 FRAN_{it} + a_7 RD_{it} + a_8 ROY_{it} + a_9 INSTIT_{it} + c_i + u_{it} \quad (2)$$

where i and t are countries and time periods, respectively; c_i is indeterminate fixed effect (by countries), “shaded effect”; u_{it} is a calculation error.

The results of testing the influence of industrial cooperation on economic growth for a sample of countries are shown in Table 4.

Table 4. Results of testing the model of industrial cooperation influence on economic growth – the method of least squares (OLS) with fixed effects

Index	Test 1 GDP	Test 2 GDP	Test 3 GDP	Test 4 GDP	Test 5 GDP	Test 6 GDP
<i>K</i>	0.122*** (5.34)	0.141*** (6.19)	0.119 *** (6.24)	0.152*** (5.67)	0.147 *** (4.60)	0.135*** (4.12)
<i>L</i>	0.487 *** (3.42)	0.376 *** (2.66)	0.394 *** (3.50)	0.430 ** (2.58)	0.453 ** (2.28)	0.541 ** (2.61)
<i>EXP</i>	0.101 * (1.96)	0.119 ** (2.41)	0.147 *** (3.62)	0.105 ** (2.07)	0.106 (1.66)	0.077 (1.16)
<i>IMP</i>	0.092 (1.50)	0.041 (0.67)	0.042 (0.88)	0.032 (0.49)	0.037 (0.43)	0.070 (0.80)
<i>FDI</i>	0.001 (0.28)	0.002 (0.64)	0.001 (0.52)	0.003 (0.95)	0.003 (0.91)	0.004 (1.30)
<i>FRAN_1</i>		0.030 *** (2.80)		0.028 ** (2.50)	0.026 ** (2.20)	0.023 * (1.95)
<i>FRAN_2</i>			-0.002 (1.60)			
<i>RD</i>				0.029 (1.16)	0.019 (0.64)	0.005 (0.16)

Index	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6
	GDP	GDP	GDP	GDP	GDP	GDP
<i>ROY</i>					0.010 (0.88)	0.009 (0.79)
<i>INSTIT</i>						0.112 (1.40)
Constant	11.008*** (4.93)	12.950*** (5.79)	12.627*** (7.23)	12.357*** (4.61)	11.720*** (3.63)	10.053*** (2.94)
Observations	92	92	75	88	76	76
Number of countries	20	20	20	20	17	17
R^2	0.84	0.86	0.90	0.87	0.86	0.87

Notes: the absolute value of t-statistics in brackets; * – significance at the level of 10%; ** – significance at the level of 5%;
*** – significance at the level of 1%.

As you can see from the specifications 2, 4, 5, 6, the coefficient of variable cooperative activity, which is measured as the number of co-operators, is positive and statistically significant but its value is 10 times smaller than the labor force coefficient; 5 times less than the capital ratio; 4 times less than the export ratio. Based on this fact, we come to the conclusion that industrial cooperation has a direct and confident influence on economic growth. The conditional share of industrial cooperation allows providing additional economic growth at the level of 2.3-3.0% per year.

Although the economic importance of industrial cooperation for economic growth is not so significant in comparison with key determinants (as you can see from the value of the coefficient of industrial cooperation in regression), industrial co-operation enhances the factor impact of the labor force by 7-10%; it enhances the factor impact of capital on economic growth by 18-20%, increases the factor impact of exports on economic growth by 25-26%. The obtained results correspond to the initial expectations and fully correlate with the concept of the study. The offered hypothesis has been confirmed; industrial cooperation is important for economic growth; its restriction can lead to a reduction in the gross domestic product to 2.3-3.0%.

It becomes obvious that industrial cooperation plays a promoting role. From the point of view of economic theory, industrial cooperation as a form of management can significantly accelerate the pace of economic development. In addition, the promotion of industrial cooperation contributes to the increase in incomes of the population, as the number of consumers of products and services of cooperative companies' increases, as well as the number of those who can create their own business on the basis of industrial cooperation. The uniqueness of industrial cooperation lies in the fact that it reduces the risk of failure in business, creates additional jobs, gives a positive experience and knowledge, and, therefore, it is a factor in the development of entrepreneurship. All this can serve as a source of economic growth for the country (or group of countries) and the driving force for the global economy.

At the same time, the development of integration and cooperation in industry between independent enterprises is a factor of increasing risks and uncertainty (Kuzmin, 2012). In terms when the activity of the organization depends on the work of other counterparties, unconditionally, there is an increase in the uncertainty regarding the provision of contractual obligations in terms of volume, quality and timing. On the other hand, industrial cooperation can be viewed as a tool for diversification. Then the overall commercial risk and uncertainty will be diffused until the number of elements of diversification passes a crucial point (after that, an additional uncertainty is created that is connected with the management and coordination of processes). As a consequence, diversification has applicability limits as a risk management tool (Kuzmin, 2015).

It is usual to single out the main risks from cooperation, for example, the risk of dependence on the partner for cooperation, the risk of secret information leak as a result of incorrect actions of the partner (partners) within the framework of industrial cooperation, the risk associated with the application of economic legislation of another country (for international industrial cooperation), the risk associated with the emergence of quasi-cooperation (Bulatov, 2010b).

Conclusions

In terms of the development of the innovative economy, the competition between enterprises is changed and transformed into the development of integration and cooperation. The industrial cooperation to a large extent is based on the comparative advantages of a particular territory (region, country) or industry. Competitive and imports pressure force companies to use interregional differences in wages and qualified personnel. This is due to the increased role of transnational corporations, the growing demand for high-tech goods and services, and limited resources.

Our study was designed to determine the degree of influence of industrial cooperation on economic growth. All this determines the specification of significant factors of influence that go beyond the traditional perception. The known determinants of economic growth, such as capital, labor, foreign trade and foreign direct investment, have been supplemented. The study also took into account research activities (concerning the indicator of expenditure on research and development), payments for the use of intellectual property rights and the subjective Index of Economic Freedom. Two main models were formed on the analysis as a variable of cooperation in the number of co-operators and in the number of enterprises in the cooperative sector. The test results showed that the model based on the number of enterprises in the cooperative sector is statistically insignificant. The remaining model allowed confirming and justifying the proposals made.

The main hypothesis of the study is that the institutional protection of property rights is a decisive factor in the development of cooperation. The test results indicate that the specification of such a model has a high statistical significance. This allows us to conclude that the strengthening of state regulation in the field of protection of property rights (including intellectual property) can be inversely related to the growth in the number of companies that are committed to cooperative activities. In other words, weak regulation in the field of protection of property rights can become a motivational incentive for cooperators to develop their activities, creating a greater number of cooperative enterprises.

The conducted evaluations also indicate that the conditional share of industrial cooperation allows providing additional economic growth at the level of 2.3-3.0% per year for the period of forecast observation. Although the industrial cooperation for economic growth is not so significant in comparison with key traditional determinants, nevertheless cooperation strengthens the factor influence of the labor force on economic growth by 7-10%; factor impact of capital – by 18-20%; factor impact of exports – by 25-26%. This allows concluding that cooperation becomes a reproductive base of socio-economic and scientific and technological progress.

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Annex

Table A. Table of data – the number of co-operators

Country	Number of cooperators				
	2017	2018	2019	2020	2021
Belgium	100	200	320	360	350
Austria	390	400	410	420	420
Croatia	125	137	150	168	175
Czech Republic	131	137	150	168	190
Denmark	180	185	186	188	188
Finland	220	255	265	270	270
France	1,137	1,229	1,396	1,477	1,569
Germany	910	950	980	980	990
Greece	570	566	563	450	456
Hungary	330	350	350	361	361
Italy	817	852	869	883	885
Netherlands	676	687	692	714	739
Poland	387	491	584	697	746
Portugal	501	521	524	570	578
Slovenia	103	106	107	103	106
Spain	850	875	919	934	947
Sweden	350	400	550	640	700
Switzerland	275	275	275	275	275
United Kingdom	809	838	845	900	929

Source: CECOP - CICOPA Europe is the European confederation of industrial and service cooperatives. Retrieved January 12, 2018, from <http://www.cecop.coop/-Publications->

Table B. The number of cooperative enterprises

Country	Number of cooperative enterprises				
	2017	2018	2019	2020	2021
Belgium	3,500	-	-	-	11,000
Austria	-	7,200	-	8,000	-
Croatia	900	-	-	900	1,000
Czech Republic	-	-	-	3,476	4,366
Denmark	7,200	7,307	7,520	7,500	7,500
Finland	3,500	4,200	4,400	4,500	4,500
France	47,291	50,127	53,101	58,351	62,041
Germany	55,000	57,000	61,000	65,500	66,900
Greece	11,650	12,796	12,048	12,084	11,113
Hungary	17,000	18,000	19,000	20,000	20,000
Italy	52,725	53,434	53,313	54,013	54,096
Netherlands	28,219	28,466	29,021	29,509	29,781
Poland	22,450	26,781	32,589	37,218	42,522
Portugal	11,271	12,206	13,000	12,016	11,760
Slovenia	1,213	1,525	1,527	1,532	1,540
Spain	59,182	58,305	57,139	56,444	58,279
Sweden	10,000	15,000	18,000	24,000	26,000
Switzerland	-	-	-	-	-
United Kingdom	36,200	36,600	36,500	38,600	40,100

Source: CECOP - CICOPA Europe is the European confederation of industrial and service cooperatives. Retrieved January 12, 2018, from <http://www.cecop.coop/-Publications>

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RELEVANCE ANALYSIS OF FACTORS ENHANCING COACHING INTERACTIONS IN ORGANIZATIONS*

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Abstract. The article discusses the factors that are expected to enhance coaching interactions and reports the survey findings on the relevance of external and internal conditions to enhance coaching interactions in organizations. A particular focus of the literature review is to explore the factors ensuring a successful coaching interaction in organization. These characteristics are recognized as important predictors of coaching effectiveness. A questionnaire is designed to investigate the relevance of conditions that are likely to enhance coaching interactions in organisations. A list of conditions generally extracted from the literature review include external indirect conditions, external direct conditions, internal conditions at the level of organisation, internal conditions at the level of groups and internal conditions at individual (client's) level. The external indirect conditions comprise the reference to coaching in the context of EU documents. The external direct conditions are focused on the conditions that are expected to ensure the quality of service delivery. Internal conditions at the level of organisation are related to the features of organisational culture. The conditions at the level of groups have collaborative focus. Internal conditions at individual level are focused on the client. The survey was conducted from December 2014 to August 2015. Respondents were targeted from two groups: those who provide coaching service and those who receive this service. 75 coaches and coaching clients from Latvia and Lithuania took part in the survey. The obtained data is analyzed by using SPSS and conducting correspondence analysis to extract the most important factors. The analysis reveals the key factors under five categories that might be important in enhancing coaching interactions in organizations. The results obtained in the study are compared with the findings of theoretical and empirical literature review. The findings of the study are important for the further research in the field of organizational coaching to investigate the impact of factors on coaching delivery throughout organizational life cycle. Limitations. The data obtained by

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using correspondence analysis can only be interpreted to make a general statement about the trends. The study is based on a limited number of respondents and therefore has certain statistic limitations.

Keywords: coaching interactions; relevance analysis; correspondence analysis; organizational performance

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JEL Classifications: M10, M19, O15

1. Introduction

Nowadays organizational coaching has experienced a period of rapid growth. The number of organizations using coaching is increasing considerably; coaching is placed among facilitated activities in a wide range of contexts. There are a number of reasons to promote coaching in organizations. Coaching has a real practical impact and provides desirable and sustainable change for the benefit of both individuals and organisations (Cox *et al.*, 2011). Moreover, coaching is a valuable tool that can trigger innovation capability. According to McCarthy (2014), the main use of coaching for innovation is to “foster a climate of innovation” in organization by facilitating the development of the innovation capability. The innovation capability is considered as the most crucial determinant of organization performance (Mone *et al.*, 1998; Oganisjana *et al.*, 2017; Tvaronavičienė, 2017; Rajnoha *et al.*, 2017). Coaching also facilitates moving beyond innovative technologies from finding ideas and developing them to linking innovations to the company's strategy and the markets for what they have done (Kelley *et al.*, 2005).

The scholars raise the question about the effectiveness of coaching interactions (Audet and Couteret, 2012). Despite the growing body of evidence-based research investigating the conditions for effective coaching outcomes, little is known regarding the research on factors that promote coaching throughout the organization. Identifying the determining factors that might contribute to coaching interactions is expected to enhance the design of coaching initiatives in organization.

Considering the peculiar issues of the use of coaching in Latvia and Lithuania, the paper aims to study the relevance of factors that are likely to enhance coaching interactions in organizations by analyzing the literature and conducting a survey among coach practitioners and coaching clients about the level of importance of conditions to promote coaching in organization. Building on the review of empirical research into coaching effectiveness in organizational context, the present study is guided by the following research question:

- What factors might contribute to the enhancement of coaching interactions in organization?

The paper begins with the literature review, then the used methodology is explained, lastly, the paper presents and discusses the survey findings.

2. Literature review

The analysis of the literature explores the key factors that influence coaching interactions from both the coach practitioner and coaching client perspective and associated with coaching effectiveness in organizational settings. The scholars (Bozer *et al.*, 2013, Vidal-Salazar *et al.*, 2012) attach importance to the effectiveness of coaching. They consider that coaching outcomes should be translated into organizational change and sustainability.

The first stage in the present literature review is to explore the essence of coaching in the context of organization. Coaching is generally defined as a support practice aims to enhance learning and development, often within a context of change (Caplan, 2003; Cox *et al.*, 2011; Cox, 2013). Behavioural change within the organisational

change opens a number of opportunities for coaching as a tool in implementing and sustaining change (Stober, 2008). Rosinski (2011) states that coaching can add value to organizational change facilitating management development beyond individual and team levels.

The role of coach is defined as a facilitator and catalyst (Audet and Couteret, 2012). Audet and Couteret (2012) argue that coaching is based on a close interpersonal relationship between those who provide coaching service (coaches) and those who consume coaching service (coaching clients). They highlighted that the relationship plays a crucial role in the effective coaching process. However, Audet and Couteret (2012) notify that the relationship might not be productive if the individual is not receptive to coaching and has negative perception of facilitative interaction. Coaching is mainly concerned with management development that encourages organisational growth and leads to sustainability (Bozer *et al.*, 2013). The literature provides extensive evidence regarding the positive effect gained from coaching initiatives in organization. Smither *et al.* (2003) examined the effects of executive coaching. They provided the data on the positive impact of coaching on setting specific goals and “solicit ideas for improvement”.

A particular focus of the literature review is to explore the factors ensuring a successful coaching interaction in organization. The obtained results are summarized in Table 1.

Table 1. Conditions likely to have influence on the effectiveness of coaching

Scholars	Conditions
Bozer G., Sarros J., Santora J. (2013)	Coachee learning goal orientation Coachee pre-training motivation Coachee feedback receptivity
Bozer G., Sarros J., Santora J. (2014)	Coach’s academic background in psychology Coach credibility
Bozer G., Sarros J., Santora J. (2013). de Haan E., Duckworth A., Birch D., Jones C. (2013)	Coachee developmental self-efficacy
de Haan E., Duckworth A., Birch D., Jones C. (2013)	Personality of the client
de Haan E., Duckworth A., Birch D., Jones C. (2013)	Coach–coachee relationship
Baron. L, Morin, L. (2009)	Supervisory support
Rekalde I., Landeta J., Albizu E. (2015).	Coach’s ability to generate trust Coach’s competence in communication skills, Coachee’s responsibility for his/her own development Coachee’s commitment to the process
Smith I., Brummel, B. (2013)	Executive involvement Perceptions of developability Individual development plans
Audet, J, Couteret, P (2012)	Entrepreneur’s open attitude to change Motivation to transfer

Source: constructed by the authors based on the literature review

de Haan *et al.* (2011) investigate the helpfulness of coaching interventions. They defined the factors that clients perceive as truly helpful in coaching, among them the ability of coach to employ appropriate techniques; the quality of relationship; the support system; the personality of the coach. Audet and Couteret (2012) direct their research towards investigating of “winning conditions” to have an impact on the success of coaching initiatives.

These conditions embody client's positive attitude to change, receptiveness to outside help and willingness to learn and change as well as being receptive to coaching and being open to change. The crucial role in the establishment of relationship belongs to the coach. It is the coach's responsibility to establish credibility and create the atmosphere of a mutual trust. Moreover, coach needs to encourage the coachee in change process, persuade the client to accept this change, acquire relevant knowledge and skills and, as a result, change the behaviour (Audet and Couteret, 2012).

Bozer *et al.* (2013) explore under which conditions coaching is likely to be more beneficial for participants. They emphasize the role of coachee characteristics such as learning goal orientation, pre-training motivation, feedback receptivity, and developmental self-efficacy. These characteristics are recognized as important predictors of coaching effectiveness. Bozer *et al.* (2014) highlight the importance of coach's educational background and credibility for improving coaching effectiveness. Rekalde *et al.* (2015) examined the factors from the coach and coaching client perspective. They emphasize the importance for coach practitioners to be competent to establish mutual trust and have communication skills.

Smith and Brummel (2013) examined the impact of executive involvement in the development process, the influence of perceptions of competency developability and the effects of creating a formal individual development plan. The results of their study prove that these specific components play a significant role in coaching interactions. Client involvement is an important prerequisite for promotion and successful implementation of coaching. The client is often considered ready when they (1) are willing to invest time and energy in the process, (2) do the work of development even when it becomes difficult and (3) take personal responsibility for transferring what is learned into action for change on the job. These three components of involvement are critical to the success of an executive's development. (Smith and Brummel, 2013). Commitment to the relationship appears to be a major success factor and constitutes a prerequisite for coaching effectiveness (de Haan *et al.*, 2013; Baron and Morin, 2009).

3. Methodology

The literature review was conducted to identify a range of factors and the survey approach was used to collect the data from coach practitioners and coaching recipients. The questionnaire was prepared to assess the relevance of a variety of factors placed in different categories. The questionnaire was pre-tested with coach practitioners to check and modify accordingly its content validity and terminology.

Questionnaire for coaches and coaching clients

The aim of the questionnaire is to investigate the relevance of conditions that are likely to enhance coaching interactions in organisations.

Sampling. Coach practitioners: sample is done from a list of coaches which is prepared preliminarily and is based on the open source database. The above mentioned sampling strategy is stipulated by the fact that coaching is not a profession in classic sense. In a traditional sense, recognition of coaching as a profession is in a long-term perspective. In the current state, coaching is mostly considered as a cross-disciplinary occupation (Gray, 2010) self-regulated by professional bodies, among which the following bodies are highlighted: International Coach Federation, European Mentoring and Coaching Council, Association for Coaching. Moreover, coaching is not the subject of governmental accreditation and professional license. As a consequence, it is nearly impossible to determine the total number of practitioners who provide coaching practice in Latvia and Lithuania. Therefore, for the purpose of the present survey, it was decided to use the open databases available on websites of coaching and training organizations in Latvia and Lithuania. Coaching recipients: sample is done from a set of people who use coaching service or are aware about coaching and have their opinion about coaching interactions. The population

size for this group of respondents is practically not known as long as this target group is composed of entrepreneurs, business owners, management at all levels as well as specialists who represent any industry in Latvia and Lithuania.

Questionnaire design. The questionnaire consists of two sections designed to gather the information to answer the research question. The Section 1 of the questionnaire consists of closed multiple choice questions and is specially designed for coach practitioners and coaching recipients. Coaches are asked to identify their professional position. Taking into consideration that coaches can combine coaching practice and employment in other areas, they are asked to select all appropriate variants. The second question is focused on the professional qualifications in coaching. The coaches are able to select both academic qualifications, i.e. Master degree in coaching and / or Bachelor degree in coaching, and non-academic qualifications provided by both International Coaching Federation (ICF) and other coaching professional bodies. The third question indicates the period of professional engagement. Thus, the created profile of the respondents gives opportunity to compare the opinion of coaches with different professional positions, qualifications and engagement. Section 1 of the questionnaire for the coaching clients comprises four multiple choice questions. They are focused on professional position and engagement of the respondents. The section also contains two questions that enable to gather information about the size of the organizations and the industries where these organizations operate.

Section 2 of the questionnaire contains closed-ended importance questions. On a rating scale of 1 to 5 with 1 being “Not important” and 5 being “Extremely important, coaches and coaching clients are asked to rate the importance of the conditions that are likely to facilitate the promotion of coaching in organisations and thus, enhance coaching interaction. These questions enable to better understand what holds significance to the respondents. The respondents’ answers also enable to make comparison and find agreement in the perception of the importance of conditions. A list of conditions is generally extracted from the literature review and includes external indirect conditions, external direct conditions, internal conditions at the level of organisation, internal conditions at the level of groups and internal conditions at individual (client’s) level.

Piloting and modifying the questionnaire. A pilot test was developed to examine content validity of the questionnaire in regards to relevance of conditions and clarity of language. Content validity, as one of the most important validation in developing new questionnaires, has become a central issue of the piloting. The Questionnaire piloting helps find the best wording and the best balance between the amount of information requested from individual respondents. The comments and suggestions of the experts in coaching are analyzed and considered. After piloting, the questionnaire was reworked.

Data processing. The obtained data is analyzed by using Statistical Package for the Social Sciences (SPSS) and conducting correspondence analysis. As an exploratory data technique, correspondent analysis aims to analyze categories of external and internal conditions for promoting coaching in organizations and extract the most important factors. Correspondence analysis is widely used in such areas as marketing and ecology. Some scholars (Doey and Kurta, 2011) consider that correspondence analysis can be applied in the other research areas where categorical variable need to be analyzed. This analysis extracts the most important data and use the graphical map to visualize the associations among variables. However, some limitations should be taken into consideration. This analysis interprets the strength of trends within the data. The distance between row points and column points shows the relativities and only general statements are made about observed trends.

4. Results and discussion

Categorization of factors identified in the literature review.

27 conditions fall under five categories. The choice of conditions is mostly guided by the findings in the literature on organizational coaching. The factors cannot be considered as exhaustive and all-inclusive.

External indirect conditions are expected to affect indirectly the promotion of coaching in organisation. They include:

- 8-1 Reference to coaching in the context of EU documents
- 8-2 Recommendations to integrate coaching in training programmes
- 8-3 Innovations in business, psychology, education, etc. that facilitate developing coaching theory

The choice of these conditions was determined by the following.

Several high-level EU initiatives, such as Entrepreneurship 2020 Action Plan, Open Innovation 2.0 (OI2), and Horizon 2020 as well as CoachCom2020 project draw attention to coaching. Coaching is proposed to apply together with management training and networking to support new businesses in crucial phases of their lifecycle and help them grow.

Innovations in business, psychology, education trigger the development of new approaches, techniques and models in coaching. These technologies are aimed at improving the effectiveness of coaching focusing on the reliability and sustainability of coaching outcomes. Effective coaching outcomes, which are the result of the innovative ideas in different areas, provide a strong argument in promotion of coaching in organisations.

External direct conditions are focused on all that might be associated with coaching service from the dissemination of good practices to the personality of coaches. The conditions were involved on the basis of literature analysis and the suggestions that were made by the experts during the questionnaire piloting. The following variables constitute external direct conditions:

- 9-1 Disseminating best practices in coaching
- 9-2 Establishing professional standards for coaches
- 9-3 Providing coaching industry research
- 9-4 Cooperation of coaching professional associations with other professional and government organizations
- 9-5 The system of professional supervision to oversee the work of the coach
- 9-6 Education and continuing training for coaches
- 9-7 Coach's ability to employ the skills related to the core coaching competences
- 9-8 Coach's awareness of business processes

The following arguments were taken into account in selection of external direct conditions. Professionalization of coaching is a complex and sensitive topic. It is a fact that only well-educated, skilled, credentialed coaches can ensure the environment that will forward coaching in organisations. However, coach training programs vary considerably, from short online courses and weekend workshops, to a three-year academic masters-level program. Establishing professional standards for coaches will allow having clearer picture of the service provided by coaches. Much work is done by the professional bodies to recognize coaching as a self-regulated profession. However, some scholars (Bachkirova, 2014) suggest that coaching presently is a market-regulated practice. It is important to develop science-based coaching practices conducting research studies in the field of coaching. Partnership between coaching professional associations and other professional organizations and government agencies expands consensus and supports community building and networking.

The system of professional supervision provides constructive feedback. 'Supervision in coaching can be broadly understood as being as a structured process for coaches designed to help coaches attend to improving the quality

of the coaching, to grow their coaching capabilities and support themselves and their practice with the help of a coaching supervisor' (Grant, 2012).

The ability to employ various techniques effectively and at the right moment may be considered as one of the components of quality. This statement was proved by the study conducted by de Haan *et al.* (2011). They concluded that a broad range of techniques are deemed helpful. However, it was suggested that general factors common to all good coaching (such as the quality of the relationship or “working alliance” between coach and client, the support system of the client, the personality of the coach, client expectations) can predict helpfulness of coaching, rather than specific behaviors, techniques, or models of coaching (de Haan *et al.*, 2011).

Internal conditions are presented at three levels: organisational, group and individual respectively.

Internal conditions at the level of organisation:

- 10-1 Goal-oriented organisational culture
- 10-2 Top management support for learning and development
- 10-3 Motivation to learn and acquire new skills
- 10-4 Requiring new skills acquisition because of organisational change
- 10-5 The opportunity to apply the knowledge and skills acquired in the training to the job
- 10-6 Relationship of trust and openness among the members of organisation

Coaching can help organisations identify the mechanisms to achieve growth that is best suited to their unique circumstances. Internal conditions at the level of organisation are related to the features of organisational culture such as goals orientation, support orientation, learning culture, relationship of mutual trust and openness, a culture of effective feedback. These components of culture create a favorable environment for the development of coaching culture within the organisation.

Internal conditions at the level of groups:

- 11-1 High cohesion and good communication within team
- 11-2 Collaborative planning
- 11-3 Making decision in groups / teams
- 11-4 Employees learning and development within the groups / teams

Teams are a key structural component in most businesses today (Peters and Carr, 2013). That is why the conditions at the level of groups are likely to have significant impact on the promotion of coaching in the groups in particular and in organization in general. Team coaching is distinct from individual coaching because in team coaching, the team as a whole is the client and collective performance is the goal, versus the individual focus of one-on-one coaching (Peters and Carr, 2013). The aim of team coaching is to support team members to structure their work and conversations to communicate well, make decisions and ensure the achievement of the optimal result through a joint effort of the group. Team coaching can also be the integral part of team learning. Therefore, the conditions that were selected for the questionnaire have collaborative focus.

Internal conditions at individual (client's) level:

- 12-1 Client's positive attitude to change
- 12-2 Being receptive to help
- 12-3 Client's willingness to learn and change
- 12-4 Client's feedback receptivity
- 12-5 Client's willingness to invest time and energy in coaching process
- 12-6 Client's involvement in the coaching process

Coaching is also rather beneficial for individuals. Changes make employees become more responsible for their personal and professional development. They need to develop certain skills to better manage themselves by improving their own performance through their own efforts and will (Stokes and Jolly, 2011). Internal conditions at individual level are focused on the client. Client engagement plays significant role in the success of coaching and extends coaching implementation in organisation.

The survey. The survey was conducted from December 2014 to August 2015. Totally 75 respondents from Latvia and Lithuania have participated. Almost 70% of coaches who did respond to the survey reported that they have graduated from the International Coach Federation approved or accredited coach training programs, and a little more than 70 % of respondents positioned themselves as executive coaches. 40 % of coaches have practiced in coaching for 3 – 5 years and 29 % of coaches have been in business for 6 – 9 years.

The obtained data are analyzed by using the Statistical Package for the Social Sciences (SPSS) and conducting correspondence analysis. Two dimensions: number of question and score are extracted. The results are presented in the form of a biplot.

Three types of conditions are analyzed under external indirect category (see Fig.1). These conditions may have an indirect impact on promotion of coaching in organization. A correspondence map demonstrates that two external indirect conditions, namely, the integration of coaching in training programmes (Q 8-2) and innovations in business, psychology, education, etc. that facilitate developing coaching theory (Q 8-3) are perceived by the respondents as more important conditions than reference to coaching in the context of EU documents (Q 8-1). Thus, Q 8-2 and Q 8-3 conditions are taken into account for the further analysis.

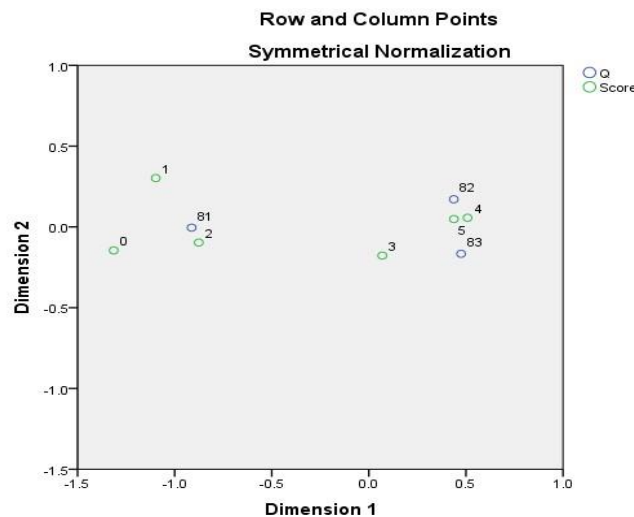


Fig.1. A biplot displaying external indirect conditions and how they relate to the level of importance
Source: constructed by the authors

Under the external direct conditions category, the conditions referring to the provision of coaching service are analyzed (see Fig.2). Three out of eight external direct conditions are placed at a close distance from point “5”.

They are the following conditions: disseminating best practices in coaching (Q 9-1), education and continuing training for coaches (Q 9-6), and coach's ability to employ the skills related to the core coaching competences (Q 9-7). This result leads to the conclusion that they are the conditions that respondents consider important. The literature provides the empirical support to these findings. Bozer *et al.* prove that coaches' academic background and credibility positively relate to coaching effectiveness.

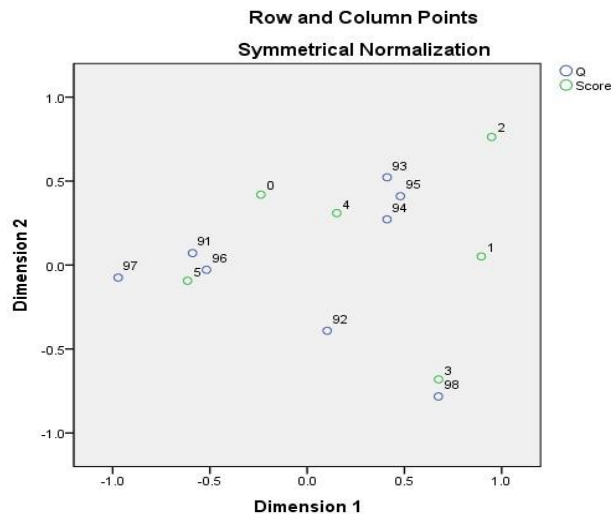


Fig. 2. A biplot displaying external direct conditions and how they relate to the level of importance
Source: constructed by the authors

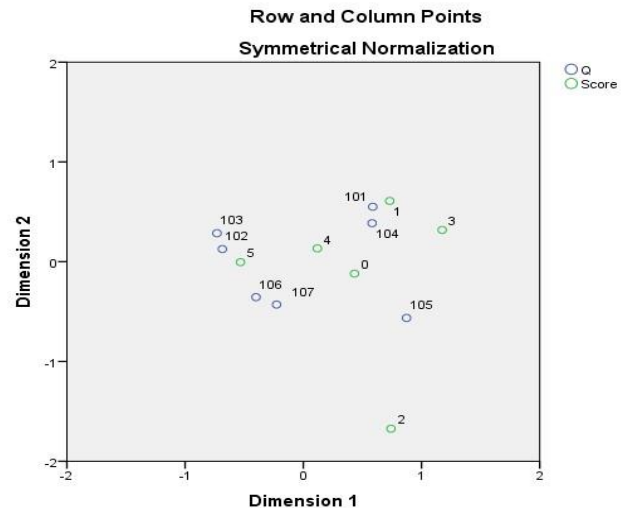


Fig.3. A biplot displaying internal conditions at the level of organization and how they relate to the level of importance
Source: constructed by the authors

Internal conditions are analyzed under three categories: organizational level, group level and individuals' level. Internal conditions at the level of organization are culture-oriented. The biplot demonstrates the distribution of points (see Fig.3). The point Q 10-2 is in the nearest position to the point "5". Therefore, the top management support for learning and development is considered by the respondents as the most important internal condition. This result is in the agreement with the empirical study made by Baron and Morin (2009). They argue that supervisor support might "reinforce the perceived value of the process and encourage the coachee's efforts to develop." Two more points Q 10-3 and Q 10-6 are also in close position to the point "5". Thus, motivation to learn and acquire new skills (Q 10-3) and the opportunity to apply the knowledge and skills acquired in the training to the job (Q10-6) are also conditions that are perceived by the respondents as important.

Internal conditions at the level of groups have collaborative focus. The results demonstrates the condition Q 11-4 (employees learning and development within the groups / teams) is placed in the shortest distance from point "5" (see Fig.4). Respondents consider this condition as the most important.

Internal conditions at individual level are focused on the recipient of coaching. The point Q12-6 is in the nearest position to point "5" (see Fig.5). This result demonstrates that "client's involvement in the coaching process" is considered as the most important condition. The points of conditions Q 12-5 (client's willingness to invest time and energy in coaching process) and Q 12-3 (client's willingness to learn and change) are closely placed to point "5" and considered the important for respondents' conditions.

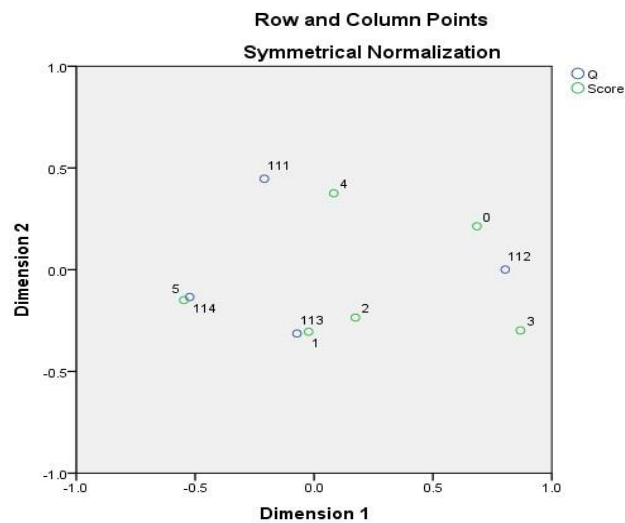


Fig. 4. A biplot displaying internal conditions at the level of groups and how they relate to the level of importance
Source: constructed by the authors

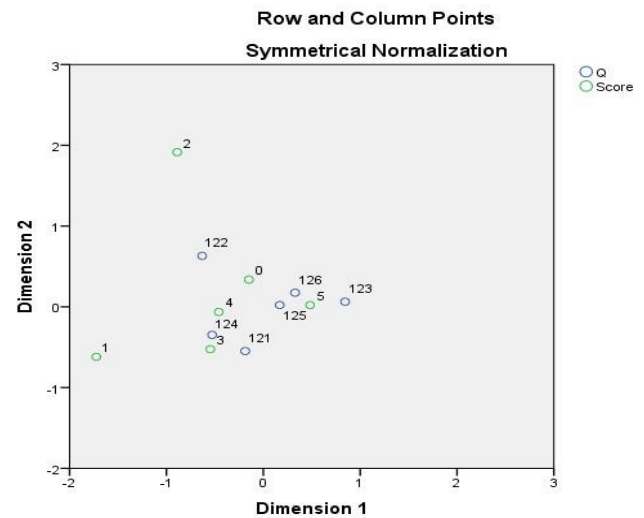


Fig.5. A biplot displaying internal conditions at individual level and how they relate to the level of importance
Source: constructed by the authors

Consolidated Table 2 presents the generalization of factors that are considered important to enhance coaching interaction in organization.

Table 2. Factors Enhancing Coaching Interactions in Organizations

External factors of indirect effect	Innovations in the related fields of knowledge
	Guidance regarding integrating coaching throughout the learning process
External factors of direct effect	Benchmarking of coaching best practices
	Continuing professional development for coaches
	Demonstrating confidence in core coaching competencies
Internal factors at the level of organisation	Support of executives
	Motivation for acquiring new skills
	A culture of trust and openness
Internal factors at the level of groups	A learning culture in groups
Internal factors at individual (client's) level	Individual's commitment to change
	Individual's readiness to invest time and energy in coaching
	Individual's engagement in the coaching process

Source: constructed by the authors

The results of this study indicate that the factors mostly related to learning and development at different levels, i.e. organizational, group and individual, are considered the most important. These factors are expected to play a meaningful role in the effectiveness of coaching engagements. The findings have empirical support made by Bozer *et al.* (2013), Rekalde *et al.* (2015), Smith and Brummel (2013).

Conclusions

The aim of the study was to explore the relevance of the conditions that can enhance coaching interactions in organization and constitute a prerequisite for coaching effectiveness.

The present paper provides the analysis of factors based on the literature review and survey of coach practitioners and coaching clients. Correspondence analysis as a statistical technique provides the graphical maps that facilitate visualization of the associations between the conditions that are expected to contribute to the effectiveness of coaching interactions and the level of importance of these conditions as it is perceived by survey respondents. The results of this study have practical implication. The findings of the study are important for the further research in the field of organizational coaching to investigate the impact of factors on coaching delivery throughout organizational life cycle.

Limitations. The data obtained by using correspondence analysis can only be interpreted to make a general statement about the trends. The study is based on a limited number of respondents and therefore has certain statistic limitations.

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PUBLIC ADMINISTRATION FOR SAFE AND SECURE ENVIRONMENT: CASE OF SLOVAK REPUBLIC

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Abstract. Important roles of the public administration in the Slovak Republic also include the formation and reinforcement of the state security system. The notion of civil service is not uniformly understood in legal theory. The Institute has a complex character, which includes a wide range of theoretical and practical questions. We understand the state service as the activity of civil servants. Those acting for a state are members of civil service. The state service may also designate the legal regime of the employees of the state apparatus, or the civil service may represent people as well as the activities of persons operating in the state apparatus. State employee is a person in a legal relationship with the state. The specific form of state service is depending on a number of factors in a number of countries. The embedding of state service in the constitutions of European states has several content ranges. Public administration impacts safety and security of a country, and therefore is considered as precondition of sustainable entrepreneurship and sustainable economic development of any country.

Keywords: public administration, state administration, public service, civil service, state security, legal environment, precondition of sustainable entrepreneurship, precondition of sustainable economic development

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JEL Classification: K31, H12, H56, K14

Additional disciplines: law

1. Introduction: public administration and state security

In this article, we apply a systemic approach to the addressed issue, mainly by using a method involving analysis and synthesis as general methods of scientific discovery. From other methods of scientific research, we apply logical methods of deduction and induction accordingly, as well as methods of comparison, observation, and abstract examination. The use of these methods leads to a deeper understanding of the particular issue. It also makes it possible to get to its core, as well as in relation to other subjects or phenomena.

Important roles of the public administration in the Slovak Republic also include the formation and reinforcement of the state security system, which is important precondition of development of sustainable entrepreneurship and sustainable economic development of country in current turbulent and insecure world (Beinoravičius, Vainiutė 2017; Danišauskas 2017; Zeman et al. 2017; Tumulavičius, Šakočius, 2017; Kuril 2018).

Public administration in a systemic and differentiated way contributes to the protection of the external and internal security of the state, and it participates to a great extent in the protection of state order and implements and ensures important tasks and measures related to crisis management. Public administration is also legitimately considered an individual and special service for the public. The public administration sector without a doubt includes law enforcement activities, namely various types of police services carried out by officers of the Slovak Police for the benefit of society (Siller, Cibák 2016, Kabát et al. 2016).

2. The concept and content of the civil service

Service in the sense of a certain obligation towards to whom it is being provided (the public, the state), in combination with this description (the public, the state) forms the terms public service and state service. Public service is activity carried out in public administration in all of its parts, meaning in state administration, local government and in public legal corporations. Public service can also be understood as a group of persons carrying out service for the benefit of a public legal corporation. In comparison to what has been referred to above, state service is a narrower term, because the definition of state service includes "only" activity performed in state administration as well as a group of persons carrying out service "only" for the benefit of a state and in relation to a state.

State service can be classified as follows:

- At its organizational level, meaning as part of an organizational system of a state as part of a state apparatus;
- From the point of view of certain activity: This involves activity of state employees performing state functions;
- As a group of persons: This defines a certain group of persons (state employees) in state services;
- As a legal regime: This expresses a means of arrangements of legal regulation of state employees;
- As a legal relationship: This represents a legal relationship between state employees and the state;
- As a legal institute, in the sense of a set of legal standards regulating a specific homogeneous group of social relationships. (Čebiřová 2001)

Even in legal theory the term state service is not understood uniformly, due to the multiple possible perceptions of this term.

State service is focused on mainly by the theory of administrative law, and it emphasizes the complex nature of the particular institute, which includes a wide range of theoretical and practical issues. State service is an inevitable an important part of state organization of society, and its function in society is conditioned on tasks and functions of the state and on their ensuring in which civil servants take part. The state defines the legal regime of state employees so that it can mainly ensure the fulfilment of state (public) interests. However, in the arrangement of state service the interests of employees are reflected more or less as well (Škultéty 2008).

If someone carries out a certain activity for the state based on having been entrusted to do so, it can be easily stated that such person is performing state service. State service can be understood as activity of state employees involving performance of state roles as the activity of employees of the state apparatus performed in a state-service relationship. As the result of the division of work, the state service creates a subsystem of community work and is part of labour law. However, it is also part of the organizational and legal system of the state apparatus, and therefore it belongs to the system of administrative law. There is no doubt that state service is of the complex nature and has a comprehensive scope. State service problems have many forms and an interdisciplinary character in the sphere of law.

The term state service is usually used in a double sense, first, as a description of activities of the employees of the state apparatus and, second, as a description of the legal regime of such persons. Unlike the general employee regime, state service represents a different and specific legal regime in that it must cover the specificities of this regime by its very nature as service.

In the legal sense, state service can be defined as a set of legal standards which regulate the status of the employees of the state apparatus (state employees). These standards regulate the creation, course and expiration of legal conditions in state service, the rights, duties and responsibilities of civil servants, and this means that they regulate the legal regime for state employees.

In the legal sense, state service represents a complex legal institute, which includes standards of various branches of law (institutional, administrative, labour etc.). The institute of state service is created by legal standards defining, the nature and sense of a numerous set and wide range of state service relationships. Standards regulating state service relationships are interconnected and, in summary, they form the institute of state service. The institute of state service is also formed by the legal standards which regulate: the establishment of a state service relationship, principles of service, rights and duties of a state employee and termination of a state service relationship.

The modern legal institute of state service is a set of legal standards, which regulate relationships formed within the organisation of the state service system, the status of state employees, i.e. legal regulation of the status of state employees in their employment relationships and as a mechanism for fulfilment of tasks in state service. The concept of the legal regulation of state service includes three major areas in the system of state service relationships:

- Formation and organization of the state service system;
- Legal regulation of the status of state employees (their status);
- Mechanism for performance of state service.

Despite their complexity, legal means used in the area of legal regulation of state service have common regulatory bases. All of them operate in a specific environment typical for the legal regime of state service. In this specific legal environment of the state service system, specific means and methods of legal regulation are also applied: permission, prohibition, obligations, subordination, control, trust of the state, loyalty etc.

The system of standards regulating state service distinguishes between substantive law and procedural law standards. The substantive law standards in the institute of state service enshrine essential characteristics (features) of this institute. These include: principles of state service, the concept of a state employee, their rights and duties, legal limitations, deadlines, guarantees and compensation, certifications, disciplinary responsibility, etc. The procedural law standards regulate relationships aimed at fulfilment of obligations (rights and duties) contained in the substantive law provisions. In the institute of state service we can find specific procedural provisions regarding the approach to the matter of hiring someone into an employment relationship in state service, disciplinary proceedings, termination of an employment relationship in state service etc.

State service includes many different controlling, organizational and other types of relationships and links which require legal regulation in the form of various legal forms via state service standards. State service standards have special features of administrative law regulation, and regulate social relationships which exclude legally equality of the parties to such relationships (Kuril 2006, 2018). In legal regulation involving organization and functioning of state service, public law standards dominate, mainly standards of administrative and constitutional law, while a specific method of regulation of the centralization of powers is applied.

State service, as a legal institute, represents a set of legal standards which regulate mutually closely linked relationships within the organisation of state service, as well as relationships that regulate the status of state employees. State service has two aspects, organisational and legal. In this context, state service is characterized as an organizational legal institute which has its own organizational forms and is regulated by legal standards. In this sense (organizational legal), the institute of state service covers standards regulating the organization of state service (this is built on the organization of the state apparatus) and standards regulating the legal regime of state employees. (Kuril, Minčič, 2015).

In our opinion, the term state service should be understood, on one hand, as the organization of state service and, on the other hand, as the legal regime relating to an employee participating in fulfilment of state tasks via state employee relationship (service relationship).

3. State employee

The term state service directly corresponds to the term state employee. This term means an individual in the state employment relationship performing civil service in a state office in accordance with applicable laws of the state. State employees carry out activities in the public (state) interest, and within the scope of their powers and authority they are representatives of the state, can present themselves and act on the state's behalf, directly participate in state power, enjoy individual rights and duties, and have some duties that survive the end of the state employment relationship.

State employees as subjects of public law relationships in state service are able to use their power and governance authority, realize specific rights and duties stemming from the authority of the state (the state apparatus) and state employees are representatives of the state and they are in a close relationship with it. State employees are representatives of public law. The unique public law status of civil servants relates to the fact that state employees have unique and special rights and duties and are subject to certain prohibitions and restrictions, but also compensation and preferences.

State employees as a category of employees in service to the state are differentiated from multiple points of view. One of the most important differentiation criteria is the categorization in terms of the authority and nature of the body in which they serve. From this point of view these are:

- Employees in state and administrative bodies with positions that define their authority to act externally (manage, decide, control), and the law bestows upon them the authority to act on behalf of the state, and to carry out administrative acts in a quality manner and enjoying special authority and protection;
- Employees in state facilities (such as teachers, physicians) whose activity mainly involves performance of services, who however also have certain authority in relation to citizens (such as confirmation of work disability status, certification of exam completion etc.);
- Employees in state and administrative bodies and/or state facilities performing, unlike the previously specified groups, also services without direct legal effects (such as clerks, accountants etc.).

4. State employment relations

Fulfilment of tasks in state service is carried out by state employees via state employment relationships. State employment relationships are conceived as public law relationships. The characteristic features in which the public law nature of state employee relationships are apparent stem from the very idea of these relationships as legal circumstances in which state employees perform state services and thereby directly take part in the exercise of state power for the implementation of the state functions. The nature of these relationships must also correspond to the specificity of the fulfilment of these tasks, and the public law nature of state employment relationships is in direct correlation with the nature of fulfilment of tasks performed which are the subjects of legal relationships.

State employment relationships are formed usually based on a decision – individual legal act. The issuance of a decision assumes that there is prior approval of a particular applicant seeking a state service position or at least a subsequent expression of consent of the employee for being hired into state service even by implicit action. In state employment relationships the state acts as an employer. The state in the position of an employer in these relationships is especially advantageous, because in them it has more leeway as an employer in dealings with the employer as well as a stricter disciplinary regime. This is the case, for example, in the service relationship of police officers. In state employment relationships, an increased level of stability of these relationships is applied, in connection with permanency. The permanency acts as significant stabilization factor in state service; however, but they do not apply to termination of an employment relationship due to a breach of service discipline. The mandatory nature of legal regulations is dominant in state employment relationships. The rights and duties of state employees are laid down by normative provisions and cannot usually be the subject to contractual negotiations. In state employment relationships, certain limitations are applied (such as a ban on business activity and/or other gainful activity), and the state makes up for these restrictions with a legally guaranteed pay and service approach (police officers in state service are entitled to promotion after fulfilling qualification requirements of general and special education and fulfilment of yearly targets in rank). Legal regulation of state service in state employment relationships has a separate position and is regulated by special legislation. Such legislation is independent of general regulation of employment relationships arising on the labour market. In state employment relationships there is a special way of resolving disputes. Whenever a dispute arises regarding the contents and scope of rights and duties, an attempt will first be made to resolve the dispute by a competent service body, and only after that fails the decision taken by the service body can be examined by a court. In state employment relationships, disciplinary responsibility is applied in case of a breach of service discipline. A breach of service discipline establishes disciplinary responsibility with the option of using disciplinary measures against the employee who has breached service discipline.

In view of the above, it can be stated that state service is one of the most important legal institute of the legal system in the Slovak Republic, which includes a wide range of theoretical and practical issues. State service consists of a certain system of social relationships, and an important part of them by its very nature, purpose and

arrangement is firmly enshrined in the organization of the state apparatus, the most extensive part of which is the organization of state administration.

State service is inevitable and important part of state organization of society, and its function in society is determined by tasks and functions of the state and on their ensuring in which employees of state service take part. State service is a historical, social and legal phenomenon and has strong political and power aspects.

In a democratic state, including our legal system, state service is usually built based on the principles of professionalism, political independence, effectiveness, flexibility, impartiality and ethics and is based on democratic values both in its internal arrangement and in all of its activities. The status of state service is a reflection of society and is one of the indicators of the political situation in a country.

State service has a complex multifaceted character, and state service has an interdisciplinary nature. The institute of state service includes an entire complex of social relationships which are regulated by the standards of more (several) branches of law. The legal regulation of state service includes standards of institutional, administrative and labour law, and therefore, this legal institute cannot be classified clearly and without any doubts only into one traditional branch of law in the legal system in the Slovak Republic (Kuril 2006, 2018).

5. Constitutional law foundations of state service

In general, it can be stated that constitutional law enshrinement of the institute of state service in the constitutions of individual countries is a sign not only of public law relationships related to the performance of state service, but it also strengthens the prestige of state service as a whole.

State (public) service and the status of state (public) employee in constitutional law has three levels:

- The first includes the constitutions of countries which are mentioned with regard to individual aspects of state service in relation to equal access to public authorities, the authorization to appoint civil servants without public service itself being the subject-matter of a separate legislative provision.

This group also includes Slovakia, whose Constitution in Article 30 (1) (4) states: "Citizens have the right to participate in the administration of public affairs directly or through election of their representatives," and "citizens have access, under equal conditions, to elected and other public functions." In the case of Article 30 (1) of the Slovak Constitution, this is one of the fundamental political rights of citizens in a democratic society. Under the term "administration of public affairs" it is necessary to understand participation of a citizen in the political life in the state, administration of the state and administration of public matters in municipalities. The right of the citizens to participate in administration of public affairs either directly or through free election of their representatives is understood as a right involving the use of tools of direct or representative democracy. The direct participation of a citizen in the governance of public affairs involves mainly the right of the citizen to participate and vote in a referendum. The participation of a citizen in the governance of public affairs through elected representatives involves the right of the citizen to participate in elections to elect representatives at the local or nationwide level and the right to vote for the candidate of choice for a particular office. The term public affairs need to be understood as including matters of public interest on the governance of which the citizens can participate in accordance with the Constitution of the Slovak Republic in the manners described therein. The exercise of the constitutional right of citizens to participate directly in the governance of public affairs is enabled by the organization and legal arrangement of local governments which create preconditions enabling all inhabitants to participate in the governance of and directly decide about public matters of local importance based on a direct and specific expression of will. This right is guaranteed to all citizens of the Slovak Republic.

Pursuant to Article 30 (4) of the Constitution of the Slovak Republic, the right to access to elected and other public offices are recognized under equal conditions for each citizen. The provisions of Article 30 (4) of the Constitution of the Slovak Republic guarantee every citizen of the Slovak Republic the right under equal conditions to access to elect and other public offices. However, this does not guarantee the right to hold a public office, only the right to access it. This means the right to run for a public office under conditions equal to those of other candidates. It can be deduced from the respective article of the Slovak Constitution that there is a right to hold a public office if the citizen fulfils all of the legally defined conditions for access to public office. This article of the Slovak Constitution does not guarantee protection from loss of public office prior to the end of the term of office. The above article of the Slovak Constitution recognizes protection of access to elected positions equal to that of other public offices.

We are of the opinion that the status of a public employee should have a place in the provisions of the Slovak Constitution. Institutional enshrinement of state service in the Slovak Constitution would not only correspond to social reality but would also raise the prestige of state service as a whole. A similar legal definition can be found in the constitutions of Belgium, Austria, Luxembourg, and Russia. (Klokočka, Wagnerová 1997)

- The second level consists of constitutions which present state (public) service with a reference that more detailed regulation is set by law.

These constitutions formulate, to a certain extent, both certain formal and substantial principles of state (public) service. This group includes, for example, also the Czech Republic. Article 79 (2) of the Constitution of the Czech Republic states: “The legal situations of state employees in ministries and other administrative bodies are regulated by law.” (Klokočka, Wagnerová 1997)

This second level of constitutional expression of state (public) service is among the most represented in the constitutions of the EU Member States. This level is presented by the constitutions of Germany, Denmark, Spain, France, Italy, and the Netherlands. (Kresák 2007)

- The representative of the third level of constitutional law expression of state (public) service and the status of a state employee is mainly Greece. Mainly Greece, but also Portugal and Finland, have constitutions that present multifield and relatively detailed regulation relating to state (public) service.

The Constitution of the Republic of Greece of 9 June 1986 assigns great importance to the issues of public service, holding public offices and status of administrative officer. In addition to the provisions of Article 4 (4), Article 12 (4), Article 16 (6) and Article 29 (3) (“Judges, members of the armed forces and security units and state employees are prohibited from expressing any views in favour of political parties, and employees of public law corporations and local governments are prohibited from acting actively for the benefit of any political party”.) The attention devoted to the positions of public administrative officers in all three institutions is above-standard, but the Greek Constitution emphasises the position of “office” and the “position of administrative officials”.

The Constitution of the Republic of Portugal of 2 April 1976 does not have a systematically reserved section devoted to public (state) service or its employees; however, the overall scope of the provisions devoted to these issues may also be considered above-standard. Similar statements however even closer to the characteristics of constitutional enshrinement of civil servants in the Constitution of the Republic of Greece, applies in relation to the provisions of the Finnish Constitution.

In addition to the provisions of both constitutions, which refer to the right to access public service based on a tender and the need for legal regulation in the form of a law for civil servants; and state employees (Article 47 (2) and Article 244 (2) of the Portuguese Constitution, Article 91 of the Finnish Constitution), in both constitutions and systematically especially in the Finnish Constitution (though not under the term “status of administrative officials), there are also provisions which can be found, in most legal systems regulating state service, in legal regulations regulating state (public) service, mainly in laws.

Conclusion

State service is a complex and complicated legal institute, which includes a wide range of theoretical and practical issues. In legal theory, the term “state service” is not understood in a coherent way. State service can be understood in an organisational sense, i.e. as an organisational unit of state service, but also as activity of state employees or the legal regime of state employees or a group of persons acting in state service. The term state service directly corresponds to the term state employee. A state employee is an individual in a legal relationship with a state. State service in the Slovak Republic is performed in state employment relationships, which can have the form of a state employment relationship (state employees during performance of state administration in a state employment relationship with the state and/or a service relationship (members of the Police Forces in a service relationship with the state).

The meaning of constitutional law, as a branch of law, is very important for the legal regulation of state (public) service in the most EU Member States. In many constitutions, the principles of holding public office are enshrined either directly (Greece, Finland), or indirectly (Article 33 (5) of the German Constitution, but also Article 34 of the French Constitution). Service law in relation to public employees is in the most constitutions reduced mainly to employment in a public law service relationship, i.e. as civil servants. Only in certain constitutions which we have mentioned above, attention is paid to employment in the public (state) service based on a private law contract, and the term “civil servant” is not used, but rather such persons are referred to as “employees of public administration (public service”, which includes the possibility of employment also on a private law basis.

It can be deduced from the given comparison of constitutional enshrinement of the institute of state (public) service in constitutions how much importance certain EU Member States or most of them assign to the constitutional regulation of state service for proper functioning of a state with the rule of law. Although in general a direct relationship between the constitutional regulation of state (public) service and its actual functioning cannot be expressed only based on legislation without more detailed constitutional arrangements, let us assume that the status of a civil servant (public employee) should also have a certain place in the provisions of the Slovak Constitution. This is also supported by the fact that the terms civil servant and civil servant status tend to be, in the eyes of the public, rather derogatory than perceived as a symbol of the rule of law, impartiality and professionalism in connection with citizens’ demands. (Kuril 2006). Legal framework of public administration directly affects efficiency of public employees to maintain safe and secure environment, which in its turn impacts conditions of sustainable entrepreneurship and sustainable economic development.

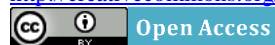
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PERCOLATION APPROACH TO SIMULATION OF A SUSTAINABLE NETWORK ECONOMY STRUCTURE

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Abstract. This study is aimed at the application of the percolation theory to simulation of a sustainable network organization of the economy in conditions of high uncertainty of the external environment. The methods for investment and cost recovery efficiency calculation in order to achieve synergy are used in the course of networks formation. The methods of graph theory and one-dimensional percolation are used herein. The conceptual content of the modified percolation approach to the analysis and simulation of network structures is specified. The controlled process of network formation offers the possibility to form the percolation cluster on the basis of minimization of its length (the shortest path). The formation regularities of two types of a percolation cluster (internal and cross-border) as the basis for the creation of the appropriate network structures are revealed. The examples of the applied problems, which study the percolation based on lattice cells (lattice coupling problem), are considered herein. The results of empirical approbation of the proposed approach in the field of services with the description of the algorithm for the networks and a cluster formation are presented. The transition from the random Bernol's percolation (based on random selection of cells) in favor of the correlated percolation is justified.

Keywords: percolation, percolation theory, cluster, networks.

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JEL Classifications: L14, D85

1. Introduction

The current stage of economy development is characterized by the ever-increasing application of network structures, reformatting the economic space and significantly influencing all aspects of its life activity (Badzho and Sheresheva, 2014). The formation of a networked economy means a phase transition of a system state, the parameters of which change abruptly. Such a transition requires the availability of appropriate analysis and simulation tools.

Networks become not only one of the most common forms of interaction between the economic entities, a means of communication in all spheres of society, but also the main force of business, creating a new system of economic relations. The networked economy has developed as an effective tool for market superiority achievement, based on the application of integration effects, synergy, the combination of freedom of choice and rational regulation. The phenomenon of the worldwide networks development allowed V. Wellman to assert a while back that “the world consists of networks” (Wellman, 1983). The networked organization of the economy has its distinctive characteristics compared to the traditional forms reflected in a number of studies (Dronov, 2012; Castells, 2000; Erznkian and Agafonov, 2011), demanding certain conditions to achieve the desired result. A distinctive feature of networks is the adaptability of their parameters adjustment to the specific requirements and capabilities of the participants, taking into account the socio-economic conditions of the territory of operation.

In the networked economy, the fundamentally new forms of organization are established, based on horizontal-partner interactions, replacing the traditional hierarchical entities and changing the principles of the market game. The processes of globalization and the all-embracing application of networked structures strongly require a scientific justification. That is why this study is aimed at the application of the percolation theory to creation of the models, offering the possibility to analyze and forecast the regularities of the dynamics of the networked organization of the economy.

2. Literature review

Percolation is a phenomenon that reveals the nature of critical transitions in the processes. Percolation models are widely used in various sciences (mathematical, physical, chemical, material sciences, etc.) for research and analysis of the objects and processes that have related domains (Wang, et al., 2017; Broadbent and Hammersley J.M., 2008), boundaries of interactions (Piraveenan. et al., 2017), resulting in the changes in the forms of organizations (Lütz, et al., 2017), configurations (Li and Zhang, 2014), composition of elements (Bianconi and Radicchi, 2016), textures (Li, et al., 2015), fractal formation (Hassan and Rahman, 2016), etc.

The percolation theory proposed by Broadbent and Hammersley (Broadbent and Hammersley, 1957), aimed at studying the properties of macroscopically disordered physical media, their phase transitions, has been applied in various sciences and in solving the applied problems. The most common problems of the percolation theory are associated with lattices, vertices, nodes, links, clusters, which in many respects is similar to the components of the networks (graphs, nodes, edges, links, a cluster).

In the conventional sense, the percolation is considered in the form of an abrupt change in the properties of the matter or processes in the case of exceeding a certain threshold of impact (Tarasevich, 2002). The use of percolation requires the use of mathematics and computer simulation (Menshikov, et al., 1986; Nazarov, 2011).

To solve the applied problems in the oil and coal industry, the fluid (oil, water) flow models in the formation and a phase transition in solid materials are used (Yapparova and Mayakova, 2010; Shirochin, et al., 2005). The

percolation is used in physics together with the Ising and Potts models, for example, in the study of crystal clusters (Ising, 1925; Potts, 1952; Dmitriev, et al., 2004).

The percolation theory is used in the simulation of dynamic information networks, for example, on the basis of structures of connected components (Prokoshev, et al., 2013), in approaches to image quality improvement (Davies, et al., 2011), analysis of fractals (Feder, 1991), etc. The hypothesis of a change in the dimension of the percolation cluster as it approached the lattice boundaries was proposed by R. Cafiero, G. Caldarelli, and A. Gabrielli (Cafiero, et al., 1997; Gabrielli, et al., 1998).

The percolation theory not only broadens the understanding of the phenomena in material objects, but also allows a more accurate simulation of economic and managerial processes. In particular, it offers the opportunity to withdraw from the predominantly sectoral analysis of the network formation regularities to the consideration of essential processes in their dynamics. One can argue that the processes of network formation in the economy take place in an artificial controlled environment. However, actually, the modern economic environment is characterized by a high degree of disorder, being under the influence of various factors of competition, risks, uncertainty, behavior of economic entities, etc. Therefore, the processes of network structures formation, especially at the initial stage of it, take place in conditions of a disordered environment.

At the same time, the analysis of networks and the study of patterns of their distribution in the economy are still based on methods used primarily for hierarchical structures, which is not always methodologically correct and expedient. In this regard, the foundations of the percolation approach to simulation the sustainable development of the networked economy are further suggested.

3. Methods

The formation of a networked economy can be viewed as a process of gradual spread (or percolation) of the networks among the economic entities (producers and consumers) to a certain level of saturation. The process of diffusion of networks violates the property of invariance of economic space organization, based on hierarchical structures.

The percolation model, reflecting the replacement of the existing hierarchical forms of organization with new network structures, the transformation of captured areas, characterizes the process of percolation, making it possible to monitor the movement of the interface (front) of the substituted and substituting organizations. The formation space of the network, which is visually represented as a grid for the analysis purposes, is understood as the industry, sphere, territory, area of economic or social activity, in which the elements and the prerequisites for the creation of networks (economic, social, innovative, etc.) are being formed.

It is assumed that the network existence medium is permeable ("porous"), and the investigated network formation space has the form of a lattice with the number of cells N (sides $L \times L$). Some part of the grid is capable of creating network structures.

A cell is a conditional interpretation of a subject (node, actor, physical or legal person), carrying out a social or economic activity. The size of a cell can reflect the fraction of the occupied space (or the scale of activity) by the subject, so their number in the lattice can vary significantly. The cells are conditionally separated from each other by borders, but they are open from the point of view of activities that require cooperation, links, resource flows, etc. The cells, interconnected by the close interaction, form the aggregations (associations) in the form of clusters.

Clustering is a local characteristic of both the percolation process and the network. It reflects the degree of partnership of this cell with its closest cells. The clustering coefficient of this cell shows the probability that the two nearest cells are in interaction with it. If the cell j has q_j neighboring cells with the number of t_j connections between them, then the value of the local clustering coefficient is defined as:

$$C_j(q_j) = \frac{h_j}{q_j(q_j - 1)/2}, \quad (1)$$

where h_j is the total number of triangles attached to cell j ; $q_j(q_j - 1)/2$ is the maximum possible number of possible triangles.

In the case of complete interconnection of this cell j with all adjacent cells, $C_j = 1$. In the absence of such interconnections, $C_j = 0$.

There are conditions for transferring the elements of the network structure to a new location (with the probability of percolation $P_\infty(p)$), as well as the presence of at least one path of their transfer and location. The probability of percolation $P_\infty(p)$ means the probability that the transfer of a good or resource (economic, social, etc.) having started the transfer in one, randomly marked, element of the network, will continue to move across all other elements related to the network. This probability is equal to the ratio $P_\infty(p)/p$.

The front for displacement of the non-network structures by the network forms is very unsustainable, bearing an element of randomness. If for the traditional process of percolation in physical media, the element of randomness is natural and, therefore, indisputable, then the socio-economic phenomena require the possibilities of external regulation to reduce its influence. At the same time, the level of randomness of the elements of the percolation process under the influence of the regulatory impact can be reduced, which will increase the likelihood of achieving the desired result – the creation of a specific socio-economic network and the achievement of the goals of its operation.

The probability of percolation of the networked forms without regulation can be reflected as:

$$P_\infty(p) = \lim_{N \rightarrow \infty} P_N(p) \quad (2)$$

This limit value is understood as the percolation threshold. In the processes of networked structures development, one of the regulatory objectives is to reduce the level of the percolation threshold $P_\infty(p) \rightarrow \min$. The influence of the regulation on the process of network formation results in the emergence of a directional percolation, which increases the likelihood of the formation of the network and the required indicators of its activity.

Graphically, the lattice can be represented in the form of black cells with conductivity – the conditions and resources for the network formation and white cells – with no conductivity, which is caused by the absence or insufficiency of sustainable prerequisites for the network elements creation (capabilities, conditions, connections, resources). The form of the lattice at the conditional instant of time t_0 , reflecting the beginning of the process of percolation through the cells (network formation), can be reflected in the following form (Fig. 1).

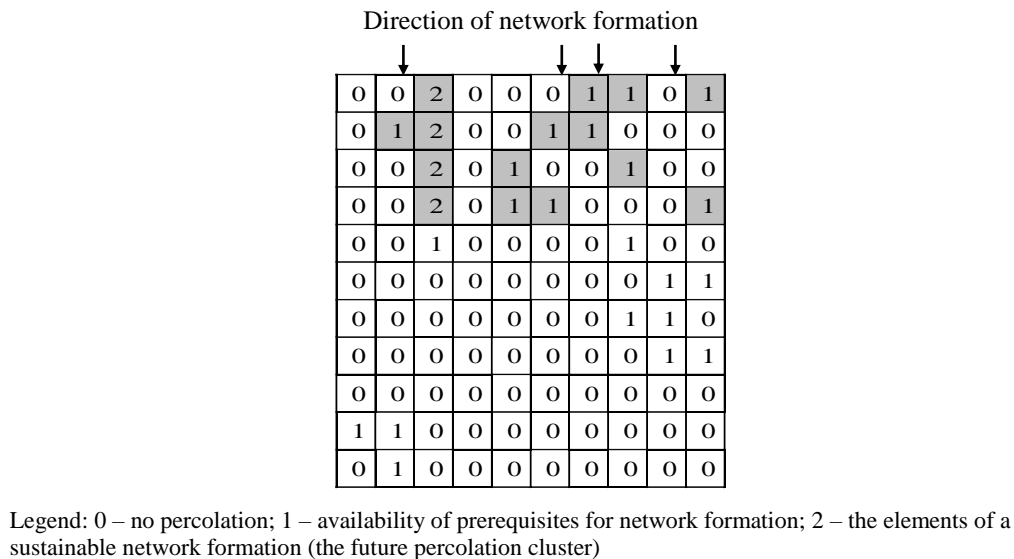


Fig. 1. Scheme of network formation lattice in the time period t_0

According to the figure, the networked structures are being created in 4 directions, but none of the networks extends over the entire investigated space (lattice), and none of the possible clusters is also formed. As the percolation process develops, the lattice cells are filled with the elements of network structures, acquiring the following form at time $t + n$ (Fig. 2).

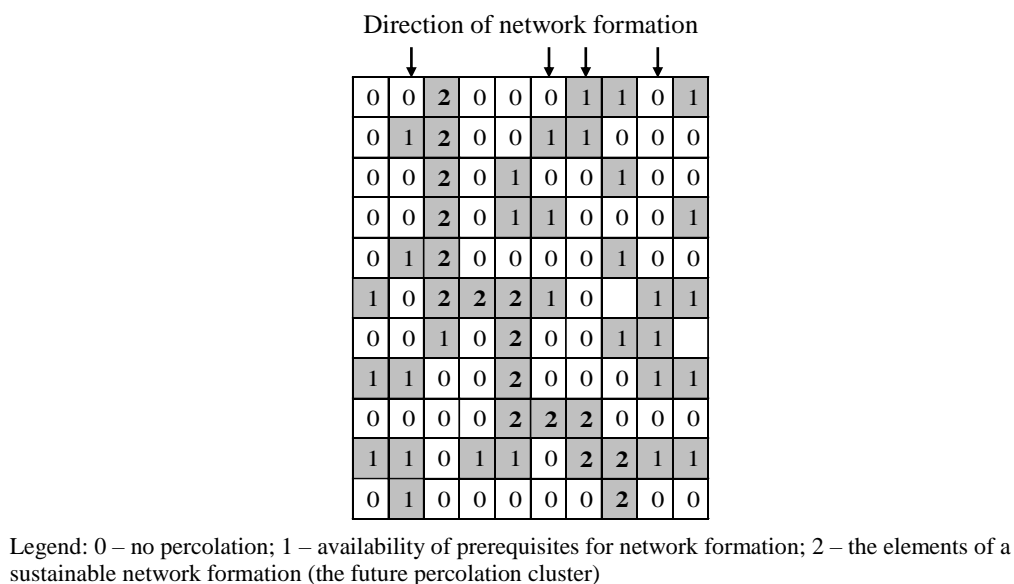
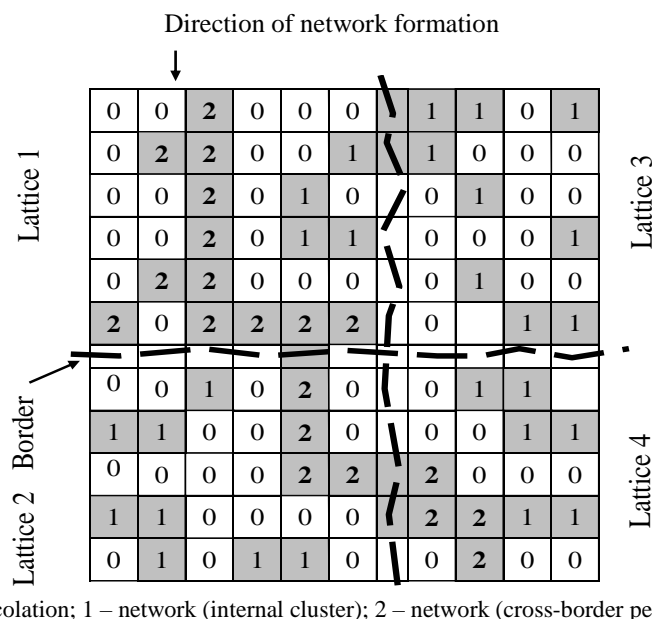


Fig. 2. Scheme of network formation lattice in the time period $t+n$

Of the 4 network development directions, the first one is the most developed, which resulted in the creation of a through-going path for percolation of the network elements from the entrance to the exit of the lattice. The problem of creation and promotion of the network elements is to find the concentration of the black cells

determining the path from the starting position through the entire lattice to the final cell, forming a percolation cluster that actually is the network.

For each given lattice cell, there is a probability P_{∞} to belong to this cluster (or network). If all lattice cells belong to the cluster, it means that all subjects are included in the network. The process of networks formation often covers a number of neighboring lattices with the borders between them. In this case, the process of percolation can be of an inter-boundary nature, facilitating the formation of an inter-boundary percolation cluster spanning several lattices (Fig. 3).



Legend: 0 – no percolation; 1 – network (internal cluster); 2 – network (cross-border percolation cluster)

Fig. 3. The cross-border nature of the percolation process

The formation of the cross-border percolation cluster means the creation of an appropriate network, which is interregional, intersectoral in nature.

In the network, due to the emergence of an integrated potential and synergy, the interconnected subjects orient their goals of interactions to achieve a common result. Theoretically, each network (cluster) is able to create a cumulative result proportional to the number of its participants. However, within the framework of the percolation process, the actors forming the different networks do not interact with each other.

In the course of the study, it was revealed that the process of network elements transfer in space (by the lattice cells) can be terminated if the number of their formation is less than a certain threshold value. This means the absence of the percolation cluster, ensuring the percolation of the appropriate resources through it for the network structure formation.

The exact value of the percolation threshold for the network structures propagation problem has not yet been determined and requires a large number of experiments and calculations. Therefore, the threshold value equal to 0.59275, determined by the Watson and Lis experiment, is used in the simulation. The modified display of simulation results of percolation probability is shown in Fig. 4.

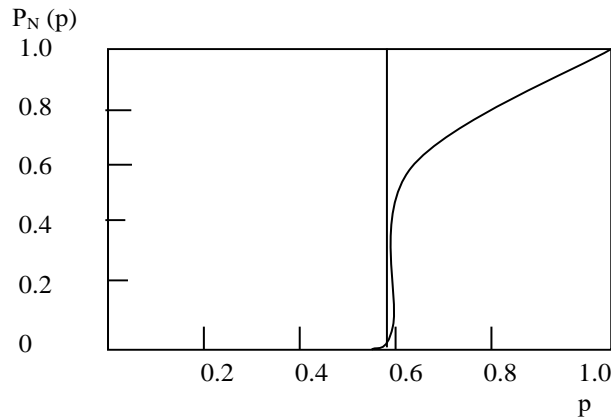


Fig. 4. Modified display of the results of percolation probability simulation

To analyze the parameters of the process of percolation of the network dynamics, a number of additional indicators should be used. The proportion of the cells coverage (subjects, participants) by the network interaction (Ds) is defined as:

$$Ds = \frac{ns}{N},$$

where ns is the number of cells participating in the network interaction; N is the total number of cells in the given lattice (the subjects in the space under study).

If $Ds \rightarrow 1$, the probability of percolation P_N increases linearly, which contributes to the emergence of the largest cluster. The size of the cluster is determined by the number of cells in it. The speed of the propagation of the percolation process (network formation) is defined as the number of cells covered by the network interaction per unit time:

$$s = \frac{ns}{t},$$

where ns is the number of cells-new participants in the network interaction; t is the time period.

4. Results and discussion

The approbation of the network structure formation on the basis of percolation presupposed the replacement of the existing hierarchical forms of the organization with the integrated firms capable of performing competitive and efficient activity in an unfavorable environment.

The space for the future network formation (for example, the service sector) for the purposes of planned actions was conditionally considered as the percolation lattice with the N number of cells in which the separate elements and conditions for a network structure creation occurred. The analysis showed that some parts (cells) of the lattice can create network structures. Based on them, in the service sector of the region the priority zones for small business development were identified, in which 7 private firms operated, including two firms (AB), closely cooperating with each other and acting as the nucleus for a percolation cluster creation (Fig. 5, a, provided below).

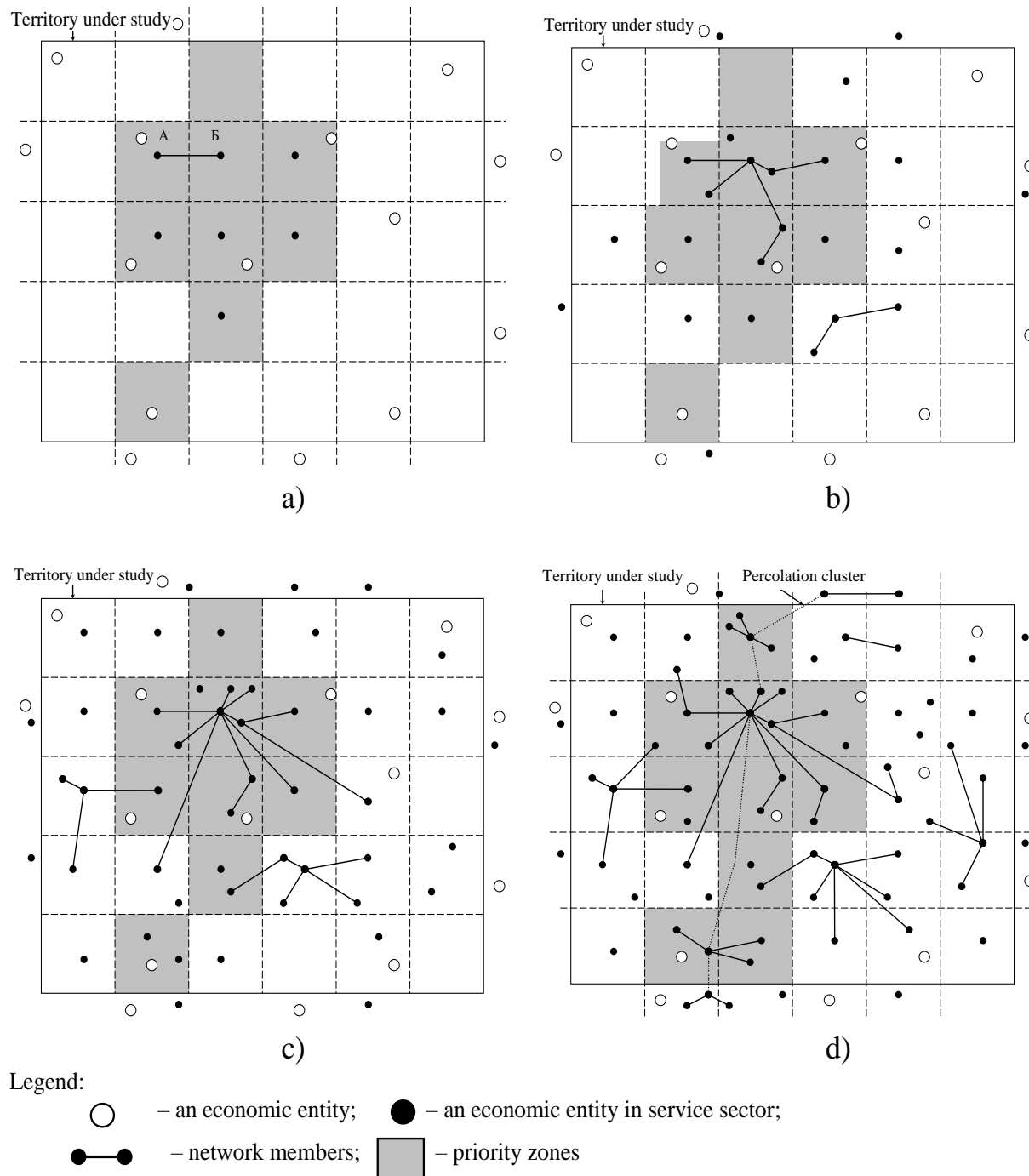


Fig. 5. Discrete visualization of the stages of network formation process

A well-founded choice of priority zones means the rejection of Bernoulli's random percolation (based on a random selection of cells) in favor of the correlated percolation.

The networks formation occurred using the methods of creation (new firms), mergers and acquisitions of the operating companies. It was assumed that the percolation cluster will consist of one or more networks of firms, approaching the opposite boundaries of the lattice, which means the onset of the percolation effect and the possibility of transfer of the network formation activity to other (neighboring) lattices.

At the stage of choosing the size of the lattice, which actually shows a certain part of the service sector, the problems of the optimal number of economic subjects, the number of firms in the network, as well as the number of networks in the cluster (not considered herein). The general approach to the solution of such problems was adopted as follows: the number of networks (and firms) should be such as the number of consumers served by them is as large as possible:

$$S = \frac{F \times Z}{\sum Z}, \quad (3)$$

where S is the number of networks; F is the number of firms; Z is the service zone of one firm (or the number of customers).

Obviously, in order to cover the demand for the services within the grid, it is required to reject the random location of the business entities across its cells.

By approbation, in 2 years the lattice acquired the form (Fig. 5, b) showing the activity of the network formation process in its various cells. Moreover, some firms were created outside of this lattice as a platform for possible further development. Over the next 2 years, the contours of three network structures emerged that could potentially form the basis of a percolation cluster (Fig. 5, c). However, two relatively small networked entities did not join the network and preferred to operate outside the priority zones.

The formation of small networks leads to the formation of small-sized appropriate clusters. In proportion to addition of more objects and increase in their concentration, they also join other clusters. A merger and consolidation of clusters take place with a decrease in their total number. Moreover, the distance between the clusters also decreases, which potentially creates the prerequisites for the development of the corresponding percolation cluster.

In this regard, it took 2 more years to clarify the priority zones and create new networks that allowed the formation of a percolation cluster and connection of the opposite boundaries of the lattice (Fig. 5, d). This cluster belongs to the number of large ones and consists of a number of small clusters and networks.

The controlled network formation process allows forming the percolation cluster on the basis of minimization of its length (the shortest path). This makes it possible to reduce the time and the costs for networks creation, increasing the coverage of the customer service areas.

The methods for investment and cost recovery efficiency calculation in order to achieve synergy are used in the course of networks formation. In general, the synergistic effect achieved by the use of the networks is defined as follows:

$$SE_{a-n} = PV_{a-n} - (PV_a + PV_b + \dots + PV_n) > 0, \quad (4)$$

where SE_{a-n} is the network containing the firms from a to n ; PV is the value of the current cost of the relevant firm.

The expenditures for the creation and operation of the network were determined by the alternative options based on the known formula for reduced costs (C_r):

$$C_r = CP + ECI, \quad (5)$$

where CP is the cost price; CI is the capital investments; E is the efficiency coefficient.

For the purposes of network creation, the option was selected, under which $C_r \rightarrow \min$ (given other conditions being equal).

Thus, the main stages of the process of network formation based on the percolation approach are applicable under the following conditions:

- (1) the boundaries of the development of the network-based economic activity are defined in the form of a lattice;
- (2) the existence of a support system for a comparatively small number of firms distributed randomly in the investigated field;
- (3) the determination of the required concentration of firms to overlap (or percolate) the surveyed customer service area;
- (4) the identification of priority zones that are promising for the creation of networks and a percolation cluster;
- (5) the introduction of a certain number of additional firms into the inter-firm and intercluster intervals of the reference system to create the networks and a continuous percolation path with a minimum length with given directions;
- (6) the attraction of additional firms in the network can be ensured by using the creation procedures, mergers and acquisitions taking into account the necessary performance and competitiveness indicators;
- (7) the stages of networking should be manageable.

Conclusion

The networked economy is a way to achieve the necessary market superiority, based on the use of integration effects, synergy, the combination of freedom of choice and the rational regulation. The formation of the networked economy is considered in this study as a process of gradual distribution of the networks among the economic entities (producers and consumers) to a certain level of saturation.

The results of the approbation of the network structure formation on the basis of the percolation theory, which involves the replacement of the existing hierarchical forms of the organization with the integrated firms, show that: some parts (cells) of the lattice are capable of creating the network structures; and the process of formation of the percolation cluster (internal and cross-border) as the basis for the creation of the appropriate network structures has a certain regularity.

Thus, the process of network formation requires the controlled percolation taking into account the conditions and the factors of the external environment dynamics. It is determined that the network formation is a percolation of the network properties, forms and resources in the socio-economic environment. This article proposes a modified approach to the study of the regularities of the network structures development in the economy based on the percolation theory.

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SECTORAL INTEGRATION AND INVESTMENT DIVERSIFICATION OPPORTUNITIES: EVIDENCE FROM COLOMBO STOCK EXCHANGE

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Abstract. This study examined the diversification opportunities within sectors of Colombo Stock Exchange by measuring co-integration among sectors. Those sectors of CSE which are not integrated with others offer good diversification opportunities. Moreover, the study also applies Granger Causality Test to determine which sectors of CSE cause other sectors. This helps an investor informing a diversified portfolio. This study employed daily closing indices of all sectors listed in Colombo Stock Exchange during the period from 1-12-2003 to 31-8-2016. Multivariate Co-integration and Pairwise Co-integration Tests are applied to determine integration among sectors and Granger Causality to determine causal relation among these Sectors of CSE. Stationarity by unit root test revealed that the fourteen sectors are selected for running cointegration at Level 1. Findings examined that no sector is integrated with other sectors. Thus, CSE provides excellent diversification opportunity to the investors. From an investor point of view, the findings of the study are helpful for a well-diversified portfolio by selecting stocks from those sectors which are not integrated with other sectors and minimize the unsystematic risk. This study significantly contribute the existing literature particularly those investors who want to diversify their portfolios domestically rather internationally.

Keywords: sectoral integration; diversification, portfolio; investment choice; Colombo Stock Exchange

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1. Introduction

Modern Portfolio Theory Harry Markowitz's (1952) is an important landmark in Finance that changed the dynamics of Portfolio Formation. He introduced the concept of correlation among securities and argued that while forming a Portfolio, those securities should be selected that are negatively correlated with each other. This helps in reducing the unsystematic risk of an investor. Following MPT, investors began to diversify their portfolios. Initially, they diversified their portfolios in the domestic context. Later, the concept for formation of globally diversified portfolios began. (Levy & Sarnat, 1970) and (Grubel & Fadner, 1971) argued that investing in capital markets of other countries provided good diversification opportunities. Globalization, emergence of multinational companies and electronic trading of stocks increased cross border investments.

The discussion of measuring the integration began in 1980's. This trend increased in 1990's with the evolution of emerging markets. With such increased cross border investment, the financial markets of the world became integrated and diversification opportunities across stock markets of other countries began to decline. Especially after Asian Crisis of 1997, Terrorist attacks in US in 2001, US Subprime Mortgage Crisis of 2007 and Chinese Stock Market Turbulence of 2015, it was observed that shocks in one market were quickly transferred to other markets. The recent trend in literature has been towards seeking diversification opportunities among different sectors within a stock market. Studies conducted by Karim (2005), Wang et al., (2005), Al-Fayoumi et al., (2009), Ahmed (2012) and Mohammad Athar Noor et al., (2014) have explored the diversification opportunities across sectors of Malaysian, Chinese, Jordanian, Egyptian and Indian stock markets respectively and found that benefits of diversification can be reaped by forming a portfolio across sectors of a stock market.

The purpose of this study is to identify diversification opportunities across various sectors of Colombo Stock Exchange, Sri Lanka. Colombo Stock Exchange has emerged as an important regional market. After the end of the Sri Lankan Civil War on May 2009, CSE indexes increased rapidly creating new records. CSE was among the best performing stock exchanges in the world in 2009 as it jumped 125.2 percent during that year. The findings of the study will help investors to diversify their portfolios locally across various sectors of Sri Lankan stock market. The results of the study significantly and practically contribute to existing knowledge of Sri Lankan stock market and helpful for that investor who only want to trade within CSE market rather to move or invest other markets.

2. Literature Review

(Darbar & Deb, 1997) documented that prompt globalization, increased financial reforms and rapid expansion in information and technology have almost removed all the hurdles in financial transaction among many financial stock markets. They have also established strong links among different stock markets in financial fraternity, therefore, interdependence of a domestic stock market on the foreign stock market has become of prime importance which led to a lot of research in this regard. In author's view that many stock markets in ASEAN and Asian NIC regions have been termed as emerging stock markets and these emerging stock markets have been very successful in attracting the attention of foreign investors. This increased interest has prompted many authors to carry out research in the stock markets of these two regions, however, research thrust got higher particularly after the Asian currency crisis (Huang & Yang, 2000) and Daly (2003). Fewer studies have been written that examined the relationship of sectors within a stock market. (Grubel & Fadner, 1971) and Karim (2005) have also highlighted this issue.

There are numerous literature have been written on different topics in the context of interdependencies of stock markets. For instance, (Chung & Liu, 1994), Shamsuddin and Kim (2003), (Phaylaktis & Ravazzolo, 2005), carried out studies on the theme of short term and long term interdependences of different stock markets. Similarly, (Arshanapalli & Doukas, 1993), (Ghosh et al., 1999), (Masih & Masih, 2002) wrote papers on leaders and followers on the particular set of stock markets. Soydemir (2000), (AuYong et al., 2004), and Chung (2005) also examined the market volatility transmission mechanism on the stock market of different countries. One of the most important contributions of the above mentioned

studies were the exposition of diversification potential among several financial and capital stock markets. In the early literature of stock markets integration Grubel (1968), (Levy & Sarnat, 1970), Solnik (1974) and Lessard (1976) documented that correlations between indices of foreign stock markets and domestic stock markets are low which give opportunities to investors to lower the risk without endangering the expected return of the portfolio by extending the portfolio's investment into foreign stocks.

(Odier & Solnik, 1993; Longin & Solnik 1995; Olienyk et al., 2002 and Glezakos et al., 2007) empirically proved that fruits of portfolio diversification lessen or may vanish completely when markets behave bearishly because co-movements among global capital markets have been increased due to the strong interdependence of economies across the globe. In the past three decades, 1987 Wall Street crisis, 1997 Asian Financial Crisis and 2008 mortgage crisis have shown the spill-over effects among stock markets across the globe. These crises have only cemented the fact that returns from portfolio diversification become low or disappear in the time of crisis or markets behave bearishly. (Arshanapalli & Doukas 1993; Sheng & Tu, 2000; Izquierdo & Lafuente, 2004; and Bekeart et al., 2005) examined the constantly changing interdependent relationship and volatility transmission of different stock markets. Researchers found that any financial crisis become contagious and effectiveness of portfolio diversification evaporates at a time when it is needed most. Mun (2005) documented that the contagious crisis make investment environment more difficult for a diversified investors because changing correlation trends and uncertainty in financial environment make it difficult to select optimal investment strategy.

Besides that, authors claimed that returns of international diversification are statistically and economically insignificant than that of domestic diversification (Errunza et al., 1999) exhibited that home-biased US investors whose portfolios consisted of equity assets and traded on US stock exchanges may exhaust cross-border diversification benefits. (Cavaglia et al., 2000) found that from 1997, opportunities in industrial inclined returns have overtaken countries inclined returns. (Ewing et al., 2003) studied that investors are interested in the performance of individual stocks as well as in the performance of difference market indices. Poshakwale (2001) has mentioned that previous findings on emerging markets have shown that these markets have complex mechanism and they have been influenced by several factors which in return help the researchers and investors to understand those factors that influence the returns and make them volatile in these stock markets. (Buguk & Brorsen, 2003) stated that researchers used frequently stock market indices to study the market efficiency and stock performances of emerging financial markets.

(Arbela et al., 2001) examined that high correlation among the central sectors of a stock market explained the weak form efficient market hypothesis. Ewing (2003) examined the sectoral interdependence of five sectors of S&P 500 and found the strong interrelationship among sectors. Karim (2005) inspected the interdependence relationship of five important sectors in Malaysia stock market and found that the sectors share a causality relationship in short run but this relationship tend to disappear in financial crisis due to the interference of players in the financial sector. Similarly (Wang et al., 2005) studied the constantly changing sectoral interdependence relationship in Chinese stock markets and they found a strong interdependency among sectors. (Al-Fayoumi et al., 2009) examined the daily returns of Amman stock exchange and, after running co-integration and granger causality test, they found interdependence among sectors. They found bidirectional relationship among sectors with the exception of services sectors which led them to report that services sector offers attractive diversification opportunity as it is not linked to other sectors.

(Constantinou et al., 2008) studied the stock market of Cyprus and their results were different as above mentioned. They found that there was no evidence of co-integration in most of bivariate cases in long run and no active sectoral interdependence relationship in short run. Therefore, Cyprus stock market is good for diversification in short run as well as in long run. (Noor et al., 2014) examined Indian stock market to inspect the short run and long run relationship among its different sectors. They gathered the daily share prices of 9 indices listed in BSE from January, 2001 to May, 2013. In order to capture the interdependence among sectors, author's employed co-integration test and granger causality test. They found no co-integration evidence in all sector of BSE except Bankex-IT and Consumer Durables-Reality. They claimed that the above finding means that investors BSE can benefit from portfolio diversification because there is no co-

integration exists among majority of the sectors. While, the results of granger causality tests, suggest that short term relationship among sectors are limited.

Ahmed (2011) examined the co-movements, causality and sectoral interdependence of in long run and short run among sectors of Egyptians stock market. In author's view point researchers and professionals are more intrigued to explore the integration of capital markets due to the changing dynamics of global economic environment. One of the important reasons of investigating the amalgamation of financial markets and stock markets is to accept the benefits and limitations of diversification in the portfolios. Author further discussed that interdependence of economies has grown stronger due to number of factors over the past three decades. Disassembling of legal embargoes, financial liberalization of economies, increase in the business of multinationals and swift progress in communication infrastructure has deepened the level of interdependence which led to limitation of portfolio diversification. When there is high uncertainty in financial and economic environment across the globe, industry diversified portfolios become more important than cross border portfolios in order to earn expected return keeping regard for the risk.

Narayan et al., (2004) documented that long term periods have less capability to absorb quick information transmission among sectors of an Athens stock market in short run and can completely ignore the transient interactions which only last for few days, therefore, high frequency data is preferred over low frequency data. The author employed unit root tests, Johansen's multivariate co-integration analysis, and Granger's causality test to achieve the objectives of the study. The author concludes that different sectors in a stock market with in a particular economy share a lesser or greater extent to long run equilibrium. This is one the reasons that these sectors move on the similar track in the long run. (Patra & Poshakwale, 2008) gave evidence that Athens stock exchange is informationally inefficient for instance (Kavussanos & Dockery, 2001) found that Athens stock market is inefficient by using multivariate generalization regressions. While other researchers like (Siourounis, 2002; Niarchos & Alexakis, 2003; Panagiotidis, 2005) applied GARCH models to examine the weak form efficient market hypothesis and found that ASE is not weakly efficient.

Patra & Poshakwale examined the sectoral interdependence in Athens stock market. The main purpose of that study was to find the empirical evidence on short run and long run relationship in major sectors of ASE. The authors explored whether the sectors behave same direction or not and if they share any influential relationship.

They also determined the direction of causality and its consistence over time. This study covered all 18 sectors in ASE but only 6 sectors capitalized 62% of capitalization, by examined only these 6 sectors for sectoral interdependence might provide good understanding about the behavior and efficiency of Greek stock market. They obtained the daily share prices of 6 sectors from the period of January, 1996 to December, 2003 with 2088 observations. These sectors belongs to Banking, Construction, Industrial, Insurance, Investment and Holding. These sectors dominated heavily when it comes to capitalization and trading ASE. In author's view, in 2003 Banking, Construction and Industry sectors captured 54% of market capitalization. Apart from using descriptive statistics and co-integration test, they also used variance decomposition tests. The authors found that they did not find any relationship among sectors in the long run but there was a short run relationship. They found that the Banking sector shared a strong relationship with other sectors in the short run and this sector intensely affected other sectors in terms of volatility and returns. They also carried out variance decomposition analysis and found that mostly variance of returns of a particular sector was influenced by that sector's returns but still banking sector was able to explain 25% and 15% of construction and insurance variance and industrial, investment and holding variance respectively.

Rahim & Masih (2016) documented that Shariah (Islamic) investors of Malaysia can obtain handsome rewards by diversifying their portfolios with the Shariah indices of Malaysia's trading partners. The trading partners they included were China, Japan, Singapore, Thailand and United States of America. Prior studies did discuss the interconnection between Malaysian stock market and its trading partners but they ignored time-varying correlations and several and different time horizons. They found that Shariah investors at Malaysian stock market did not gain any diversification benefits when it comes to integral trading partners like China and Singapore but they did get little gain while trading with Japan and Thailand. Bouri et al., (2017) studied the co-integration and nonlinear causality among different sectors of

Indian market. The sectors were gold, oil and stock market. They were of the view that the biggest imports of India are gold and oil and their prices effect the domestic prices of commodities and stock market thus affecting the inflation. They found that there exists a co-integration and nonlinear positive relationship among gold, oil and stock market of India. They also found a bi directional relationship between oil and gold.

Billio et al., (2016) studied the effectiveness of integration measures of portfolio diversification. They compare several measures of financial integration processes. They cluster their sample in developed market equity indices, emerging market indices and developed and emerging market indices. The obtained the monthly equity data and found that all the measures were resulting in similar long run integration pattern. Based on their findings, they termed standard correlations as a good measure to explain variations in diversification benefits. Nitoi et al., (2016) studied the Central and Eastern European countries or CEE for financial convergence. The covered the time period of financial and sovereign debt crisis i.e. 2007 to 2014. They found no evidence of homogenous convergence among the financial markets of CEE countries. They also found that the differences among stock markets of CEE countries have been increased greatly due particularly post financial and sovereign debt crisis but they suggested that structural reforms are needed for bringing in greater financial convergence among CEE countries. Alam et al., (2016) measure the sectoral efficiency of Islamic indices. They took the data of 10 global indices for both Islamic and conventional over a period of 18 years which started from January, 1996 to December, 2014. They further categorize that data into four sub-time periods.

To measure the sectoral efficiency of sampled indices author's employed multifractal de-trended fluctuation analysis. They found the same pattern of efficiency in conventional and Islamic indices for a short horizon time period but Islamic indices showed higher efficiency in the last decade. Kim & Sun (2017) studied the dynamic conditional correlations between Chinese sector and S & P 500 index for a period of 2006 to 2014. They found that correlations among the stocks are varying significantly across sectors and over time. They wrote that fruitful investment opportunities in a specific sector arise and are particularly associated with the magnitude of dynamic conditional correlations. Shahzad et al., (2017) examine the risk spillovers and dependence structure among five Islamic stock indices and oil. They studied the downside and upside of risk spillovers and these indices were the Islamic Market World index, Islamic indices of USA, UK, Japan and the Islamic Financials sector index. The authors termed these indices as extremely important. These indices and oil sector are particularly attractive to faith oriented investors. They find that the relationship between oil and Islamic stock indices is based on the time varying lower tails. They also found that there is a risk spillovers effect going on from oil to Islamic stock indices and it was asymmetric. Similarly, risk spillovers were studied in terms of upside and downside of risk.

Bundoo (2017) studied the integration of stock markets of Southern African Development Community or SADC. In this study, the author examined the beta and sigma convergence and applied co-integration to examine the integration of South African stock markets. The author found no co-integration when US stock index was used as benchmark but a greater co-integration was identified when SSA index was used. The author recommended that SADC stock markets should look for more integration with each other to have stable portfolios instead of volatile portfolios. The SADC should also attract foreign direct investment which is essential for stronger stock markets. Chiang and Chen (2016) reviewed the conditional correlations between Chinese stock market and international stock markets. They found that the existence of correlations among stock returns of several stock markets. The correlation was time varying. They also reported that dynamic correlations were tied to the geographical location.

3. Research Methodology

3.1 Data Collection

This study employed daily closing index of following sectors from Colombo Stock Exchange during the period from January 2003 to August 2016. Bank Finance And Insurance, Beverage Food And Tobacco, Construction And Engineering, Chemicals And Pharmaceuticals, Diversified Holdings, Footwear And Textile, Hotels And Travels, Health Care, Investment Trusts, Information Technology, Land And Property, Manufacturing, Motors, Oil Palms, Power & Energy, Plantations, Stores Supplies, Services, Telecommunications, Trading; All indices are considered as their local currency and gathered by official web. The returns of these indices have been calculated using following formula (1):

$$Returns = \frac{Index_t - Index_{t-1}}{Index_{t-1}} \times 100 \quad (1)$$

Where:

Index_t = Closing index,

Index_{t-1} = Opening index

For running co-integration, the time series must be stationary at same order. Dickey-Fuller test is applied to determine the stationarity. Johansen's co-integration Test is used to determine long run relationship among various sectors of CSE. The test uses Eigen value or trace statistics. In order to apply Johansen's Co-integration Test, a suitable lag length is selected using VAR based on Akaike Information Criteria (AIC). Granger causality test is employed to determine which sectors cause the movement in index of other sectors. The integration among the sectors can be uni-directional or bi-directional.

4. Empirical Results

4.1 Descriptive Statistics

Table 1 presents the descriptive statistics of the returns of all listed and studied indexes in Colombo Stock Exchange. In descriptive summary statistics Motors and Oil palms shows highest returns with the value of 0.1175 and 0.1158 while the value of standard deviation is 2.0748 and 3.2693 respectively. Whereas, Telecommunications has the lowest mean returns with the value of 0.0211 while the standard deviation is 1.6497. Info technology is the most volatile sector having highest standard deviation while Beverages Food Tobacco sector shows the least volatility with lowest standard deviation (Table 1).

Table 1. Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
INVESTMENTTRUST	0.0779	2.5083	-26.9359	41.9724
LANDPROPERTY	0.0642	1.9927	-13.3261	20.1230
MANUFACTURING	0.0762	1.7608	-37.7494	60.2028
MOTORS	0.1175	2.0748	-14.9580	49.9142
OIL PALMS	0.1158	3.2693	-32.5968	98.8543
PLANTATIONS	0.0499	1.7402	-14.2950	13.4506
POWERENERGY	0.0337	2.0229	-13.0936	59.5500
SERVICES	0.0691	2.2888	-15.3613	34.9052
STORESUPPLIES	0.0781	2.5107	-27.2190	24.3749
BANKSFINANCEINS	0.0598	1.1445	-11.6956	10.0886
BEVERAGESFOODTOBACCO	0.0914	1.1432	-10.5224	9.3555
CHEMICALPHARMACEUTIC	0.0615	1.5638	-13.4143	13.5518
CONSTRUCTIONENG	0.0908	2.0548	-13.2766	17.4771
DIVERSHOLDINGS	0.0561	1.2994	-14.5574	19.6979
FOOTWEARTEXTILES	0.0624	2.3087	-17.0271	43.8563
HEALTHCARE	0.0909	1.8486	-11.4769	39.4484
HOTELSTRAVELS	0.0528	1.4554	-11.8181	20.5343
INFOTECHNOLOGY	0.0790	4.0400	-28.5837	75.0075
TELECOMUNICATION	0.0211	1.6497	-14.8148	19.8129
TRADING	0.0980	2.0102	-19.5588	24.3003

4.2 Correlation Matrix

Table-2 shows the correlation matrix of sample indices returns of CSE. The correlation among most of these sectors is low. However, the correlation between Land Property and Bank Finance Insurance, Chemical Pharmaceuticals and Bank Finance Insurance, Diverse Holdings and Bank Finance Insurance, Hotel Travels and Bank Finance Insurance, Bank Finance Insurance and Telecommunication, Bank Finance Insurance and Beverages Food Tobacco, Diverse Holdings and Hotel Travels are high. Correlation matrix consists of two tables for decent presentation (Table 2a and Table 2b).

Table 2a. Correlation Matrix

Sector Names	Investment	Land Property	Manufacturing	Motors	Oil Palms	Plantations	Power Energy	Services	Store Supplies	Banks Financeins
Investment	1									
Land Property	0.3710	1								
Manufacturing	0.3159	0.454	1							
Motors	0.2235	0.2791	0.2354	1						
Oil Palms	0.2254	0.1008	0.0997	0.0694	1					
Plantations	0.2961	0.4281	0.3387	0.2253	0.126	1				
Power Energy	0.262	0.3356	0.2848	0.1543	0.0797	0.285	1			
Services	0.2517	0.2716	0.239	0.1422	0.0522	0.2206	0.1933	1		
Store Supplies	0.0985	0.0884	0.0776	0.1271	-0.0111	0.1281	0.1049	0.0437	1	
Banks Financeins	0.4328	0.5852	0.5089	0.3291	0.1472	0.4833	0.3516	0.3636	0.1301	1
Beverages Food Tobacco	0.3527	0.4588	0.4132	0.2389	0.1262	0.3622	0.2912	0.2862	0.0491	0.567
Chemical & Phar.	0.3215	0.4257	0.3471	0.2379	0.1003	0.3687	0.2756	0.221	0.1617	0.5099
Construction & Eng.	0.3245	0.3896	0.3083	0.1576	0.1033	0.3028	0.263	0.2103	0.0551	0.44
Divers Holdings	0.3942	0.4293	0.3492	0.2452	0.196	0.3966	0.3148	0.3054	0.097	0.6007
Foot Wear Textiles	0.3017	0.3609	0.3052	0.1983	0.0806	0.2893	0.2476	0.1715	0.1063	0.3915
Health Care	0.2421	0.3784	0.2908	0.1561	0.0795	0.307	0.4707	0.1867	0.1032	0.3625
Hotels Travels	0.3585	0.4961	0.4027	0.2523	0.1191	0.4216	0.3091	0.2843	0.0988	0.5847
Info Technology	0.2879	0.2805	0.1808	0.1273	0.0502	0.2398	0.2042	0.1247	0.0655	0.2668
Telecommunication	0.2731	0.3838	0.3085	0.1959	0.1064	0.3272	0.2638	0.2332	0.0481	0.4932
Trading	0.3009	0.3998	0.3375	0.2285	0.0837	0.3458	0.2823	0.2461	0.1331	0.4746

Table 2b. Correlation Matrix

	Beverages Food Tobacco	Chemical & Phar.	Construction & Eng.	Divers Holdings	Foot Wear Text.	Health Care	Hotels Travels	Info Tech.	Telecom .	Trading
Beverages Food Tobacco	1									
Chemical & Phar.	0.378	1								
Construction & Eng.	0.3588	0.3287	1							
Divers Holdings	0.4748	0.388	0.3439	1						
Foot Wear Textiles	0.2995	0.2968	0.2496	0.2824	1					
Health Care	0.308	0.2865	0.2686	0.2931	0.2797	1				
Hotels Travels	0.4846	0.3729	0.3754	0.5218	0.2836	0.2917	1			
Info Technology	0.187	0.2313	0.1907	0.2192	0.1903	0.2007	0.2424	1		
Telecommunication	0.3766	0.2811	0.2803	0.4059	0.2611	0.2105	0.4238	0.1542	1	
Trading	0.3576	0.3743	0.3156	0.3625	0.312	0.2744	0.3851	0.2406	0.2931	1

4.3 Unit Root Test

The correlation matrix only shows the relationship strength among indices rather to measure the long run relationship among the sector indices. To find the long run relationship among indices applied co-integration test. One of the assumptions of co-integration test is that the time series is stationary. Results of the Dickey Fuller Test for stationarity found that seven sectors are stationary at Level 0 and thirteen sectors are stationary at Level-1. We have selected those thirteen sectors that are stationary at Level 1 (Table 3a and Table 3b).

Table 3a. Unit Root Test at Level 0

Sector	1% Critical Value	Level 0		Remarks
		t-stat	Prob.	
Footwear And Textile	-3.430	-3.113	0.026	stationary
Health Care	-3.430	-7.841	0.000	stationary
Investment Trusts	-3.430	-3.388	0.011	stationary
Manufacturing	-3.430	-19.240	0.000	Stationary
Power & Energy	-3.430	-20.604	0.000	Stationary
Plantations	-3.430	-23.035	0.000	Stationary
Stores Supplies	-3.430	-3.307	0.015	Stationary

Table 3 b. Unit Root Test at Level 0 and Level 1

Sectors	1% Critical Value	Level 0		Remarks	Level 1		Remarks
		t-stat	Prob.		t-stat	Prob.	
Bank Finance And Insurance	-3.430	-0.522	0.888	not stationary	-47.957	0.0000	stationary
Beverage Food And Tobacco	-3.430	0.332	0.979	not stationary	-55.567	0.0000	stationary
Construction And Engineering	-3.430	-2.506	0.114	not stationary	-85.005	0.0000	stationary
Chemicals And Pharmaceuticals	-3.430	-1.364	0.599	not stationary	-59.870	0.0000	stationary
Diversified Holdings	-3.430	-2.109	0.241	not stationary	-82.360	0.0000	stationary
Hotels And Travels	-3.430	-2.571	0.099	not stationary	-92.233	0.0000	stationary
Information Technology	-3.430	-2.367	0.151	not stationary	-54.896	0.000	stationary
Land And Property	-3.430	-1.440	0.563	not stationary	-58.023	0.000	stationary
Motors	-3.430	-1.178	0.683	not stationary	-57.286	0.000	stationary
Oil Palms	-3.430	-1.430	0.568	not stationary	-56.001	0.000	stationary
Services	-3.430	-1.483	0.542	not stationary	-61.930	0.000	stationary
Telecommunications	-3.430	-1.823	0.369	not stationary	-57.173	0.000	stationary
Trading	-3.430	-0.949	0.771	not stationary	-56.457	0.000	stationary

4.4 VAR Lag Length Selection

Before moving towards co-integration and Granger Causality test, it is important to determine the lag length selection. The lag length is determined based on tests of LR= Sequential modified LR test statistic, FPE= Final prediction error, AIC= Akaike information criterion, SBIC =Schwarz Bayesian information criterion and HQIC= Hannan-Quinn information criterion. The results of the lag length selection criteria based on the above mentioned test suggest that lag four is suitable for measure the integration and causality (Table 4).

Table 4. VAR Lag length Selection Criteria

lag	LL	LR	df	P	FPE	AIC	HQIC	SBIC
0	-354481				2.10E+75	213.166	213.175	213.192
1	-259706	1.90E+05	196	0	4.20E+50	156.294	156.432	156.679*
2	-259149	1114.5	196	0	3.40E+50	156.076	156.343	156.822
3	-258699	900.73	196	0	2.90E+50	155.923	156.319*	157.029
4	-258426	545.89*	196	0	2.8e+50*	155.877*	156.402	157.343

4.5 Multivariate Johansen's Co-integration Test

The Johansen's multivariate co-integration test suggests the number of co-integrating sectors. However, it does not shows which sector is co-integrated with other sector. To measure the co-integration with one sector to others, study applied Pairwise co-integration (Table 5).

Table 5. Multivariate Johansen's Co-integration Tests

Maximum Rank	Parms	LL	Eigenvalue	Trace Statistics	5% Critical Value
0	602	-258771	.	690.2177*	.
1	629	-258682	0.05184	513.1745	.
2	654	-258622	0.03552	392.8739	.
3	677	-258571	0.03037	290.298	277.71
4	698	-258540	0.01827	228.9845	233.13
5	717	-258515	0.01502	178.6494	192.89
6	734	-258493	0.01298	135.1811	156
7	749	-258476	0.01053	99.9854	124.24
8	762	-258459	0.00997	66.6599	94.15
9	773	-258448	0.00699	43.3416	68.52
10	782	-258439	0.00534	25.5358	47.21
11	789	-258432	0.00378	12.9516	29.68
12	794	-258428	0.00257	4.3948	15.41
13	797	-258426	0.00122	0.323	3.76
14	798	-258426	0.0001		

Note: *indicates co integrated equations

4.6 Pair Wise Co-integration Test

Table-6 presents the pair wise co-integration of a selected Sector with all other sectors of both groups. The decision is made on the basis of trace statistics with 5% critical value of 15.41. The value of trace statistic less than 15.41 shows there is no co-integration between selected sectors. The results of Pairwise co-integration reveal that there are several sectors which are not integrated with each other and provide diversification opportunity to investors. Bank Finance and Insurance sector is not integrated with chemicals pharmaceuticals, info technology, land property, motors, oil palms, services, telecommunication, and trading. Beverages Food and Tobacco sector is least integrated and provides good diversification opportunity with all other sectors whereas construction engineering is not integrated with info technology, land property, motors, oil palms, services, telecommunication and trading. Chemical pharmaceuticals is only integrated with diverse holdings, hotel travels, motors and trading whereas diverse holdings and hotel travels are integrated with most other sectors and do not provide opportunity of diversification. However, info technology, land property, motors, oil palms,

services, telecommunication and trading are not integrated with most other sectors and provide good diversification opportunities (Table 6, Table 7).

Table 6. Pair wise Co-integration

	Banks Financeins	Beverages Food Tobacco	Construction & Eng.	Chemical & Phar.	Divers Holdings	Hotels Travels	Info Tech.	Land Property	Motors	Oil Palms	Services	Telecom.	Trading
Banks Financeins													
Beverages Food Tobacco	2.6455*												
Construction & Eng.	18.1745	10.416*											
Chemical & Phar.	3.6825*	3.9554*	29.2934										
Divers Holdings	22.3328	10.143*	41.7803	22.2889									
Hotels Travels	23.9819	10.817*	21.4801	45.5335	76.0033								
Info Tech.	6.8253*	7.4121*	10.648*	10.031*	9.3326*	11.850*							
Land Property	14.7720*	13.115*	10.510*	6.4730*	14.904*	10.630*	8.0899*						
Motors	5.4468*	2.6513*	26.889	41.0661	26.8389	42.3498	10.536*	7.217*					
Oil Palms	12.1673*	4.3802*	24.3602	23.4971	46.2601	31.7013	15.070*	10.620	24.961				
Services	13.0295*	6.1753*	27.683	14.196*	84.5886	39.1958	8.5894*	11.415*	22.479	35.793			
Telecom.	3.7452*	3.9565*	6.8338*	5.3055*	6.1900*	8.5482*	9.6290*	5.852*	5.052*	5.813*	5.4748*		
Trading	5.1552*	2.4805*	29.5312	26.6565	37.5094	47.4714	8.3071*	6.801*	36.825	25.772	24.4898	4.498*	

Note: 5% critical value = 15.41, *indicates no co-integration

Table 7. Granger Causality Test-Excluded Sectors

	Banks Financeins	Beverages Food Tobacco	Construction & Eng.	Chemical & Phar.	Divers Holdings	Hotels Travels	Info Tech.	Land Property	Motors	Oil Palms	Services	Telecom.	Trading
Banks Financeins		1.8713	6.7503	10.082*	7.1474	7.1667	7.8897	1.3447	4.2301	0.3912	12.836*	4.6234	19.0*
Beverages Food Tobacco	8.8445		6.4297	1.6297	22.009*	5.8627	4.1971	1.682	0.8146	3.1861	5.7697	0.3905	1.916
Construction & Eng.	5.1304	0.41958		73.736*	16.085*	14.757*	1.3488	8.5622	4.4256	17.21*	2.5654	12.35*	6.564
Chemical & Phar.	11.206*	2.1653	10.94*		4.8245	3.8688	7.0903	5.9149	7.0766	52.80*	18.396*	8.3155	1.092
Divers Holdings	2.086	10.747*	63.37*	5.5293		98.462*	3.4197	4.8801	2.0996	9.065*	10.549*	5.295	2.755
Hotels Travels	40.025*	3.5902	91.58*	14.292*	266.72*		2.9214	11.37*	15.02*	4.1958	15.153*	8.4941	4.161
Info Tech.	3.5182	3.982	6.3641	16.277*	2.1688	8.5466		9.61*	18.13*	33.18*	7.136	4.0084	2.173
Land Property	3.9658	10.968*	14.25*	10.24*	35.252*	31.135*	4.1294		10.18*	1.8049	7.7296	4.7106	3.271
Motors	19.58*	0.62725	3.3922	20.446*	4.2311	5.5337	9.5072*	5.33		9.09*	16.999*	8.1693	23.1*
Oil Palms	6.0819	1.1793	13.05*	1.6737	39.671*	20.651*	3.4598	4.7053	7.8131		10.423*	1.4318	9.057
Services	14.489*	8.3176	6.6591	19.942*	2.7701	8.6613	17.75*	6.1482	8.7224	6.1517		2.1734	7.632
Telecom.	5.3264	3.0561	28.97*	2.5769	46.42*	48.143*	8.2943	4.1737	1.7062	6.554	12.458*		5.536
Trading	12.332*	2.1493	23.76*	7.6452	25.355*	32.198*	4.0305	14.08*	10.86*	7.8805	9.5632*	2.7266	

Note: *indicates significant at 5% and excluded sector causes equation sector

4.7 Granger Causality Test

The results of Granger Causality test show that Hotel Travels, Land Property and Trading cause most of the others sectors. However, Bank Finance Insurance, Beverage Food Tobacco and Chemicals Pharmaceuticals are the least caused sectors. The results also indicates that bi-directional causality exists among Chemicals Pharmaceuticals-Bank Finance Insurance, Services-Bank Finance Insurance, Trading- Bank Finance Insurance, Diverse holdings- Beverage Food Tobacco, Chemicals Pharmaceuticals –Construction, Diverse holdings-Construction, Oil palms-Constructrions, Telecommunication-Constructrions and Services- Chemicals Pharmaceuticals. The results are of vital importance for an investor who wants to diversify his portfolio within a Sri-Lankan stock market. Bank Finance Insurance, Beverage Food Tobacco and Chemicals Pharmaceuticals are the sectors which are least caused by other section and may serve as important part of an investor's portfolio.

Conclusion

This study examines the integration among sectors of Colombo Stock Exchange during the period from 1-12-2003 to 31-8-2016. Colombo Stock Exchange comprises of 20 sectors. Results of unit root test shows, seven of these sectors were found to be stationary at level 0 and thirteen sectors were stationary at Level 1. These thirteen sectors were tested for co-integration. The results of the study revealed that Colombo Stock Exchange provides good diversification opportunity to individual or group investors across sectors at natively. The results of Pairwise Johansen's Co-integration test shows that Info technology, Land Property, Motors, Oil palms, Services, Telecommunication and Trading sectors provide excellent diversification opportunity. The results of Granger Causality tests extents that Manufacturing, Store Supplies, Hotel Travels, Land Property and Trading are the sectors which cause other sectors. Plantations, Bank Finance Insurance, Beverage Food Tobacco and Chemicals Pharmaceuticals are the least caused sectors.

From an investor's view point, the findings are helpful in forming a well-diversified portfolio by selecting stocks from those sectors which are not integrated with other sectors and minimize the unsystematic risk through diversification. The results of the study are particularly encouraging for those investors who want to diversify their portfolios domestically especially those investors who do not have access to international markets. One of the limitations of the study is that it ignores the impact of seven sectors which were found to be stationary at level 0, while running co-integration. Thus, the impact of these sectors while forming a diversified portfolio is ignored. For a future researcher, it is suggested to seek diversification opportunities among those sectors of CSE also that are stationary at Level 0.

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SECURE PERSONAL DATA ADMINISTRATION IN THE SOCIAL NETWORKS: THE CASE OF VOLUNTARY SHARING OF PERSONAL DATA ON THE FACEBOOK

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Abstract. In view of the changes taking place in society, social progress and the achievements of science and technology, the protection of fundamental rights must be strengthened. The aim of the article is to analyse the principles and peculiarities of safe management of the personal data in social networks. In this scientific article, methods of document analysis, scientific literature review, case study and generalization are used. Consumers themselves decide how much and what kind of information to publicize on the Facebook social network. In order to use the third-party applications, users at the time of authorization must confirm that they agree to give access to their personal data otherwise the service will not be provided. Personal data of the Facebook user comprise his/her public profile including user's photo, age, gender, and other public information; a list of friends; e-mail mail; time zone records; birthday; photos; hobbies, etc. Which personal data will be requested from the user depends on the third-party application. Analysis of the legal protection of personal data in the internet social networks reveals that it is limited to the international and European Union legal regulation on protection of the personal data in the online social networks. Users who make publicly available a large amount of personal information on the Facebook social network should decide on the issue if they want to share that information with third parties for the use of their services (applications). This article presents a model for user and third party application interaction, and an analysis of risks and recommendations to ensure the security of personal data of the user.

Keywords: personal data, third-party applications, social network, security of the data

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JEL Classifications: D80, D83, M15

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1. Introduction

A social network is generally defined as a system with a set of social actors and a collection of social relations that specify how these actors are relationally tied together (Wasserman, Faust, 1994). Authors Boyd and Ellison (2007) define social network sites as web-based services that allow individuals to construct a public or semi-public profile within a bounded system, articulate a list of other users with whom they share a connection, and view and traverse their list of connections and those made by others within the system. Social networking has become one of the most important communication tools among people nowadays (Zaidieh, 2012). Virtual social networks present the constantly changing and extremely dynamic platform. By competing with each other, virtual social networks create an ever-increasing number of functionalities for the users in order to create the most convenient modes for communication. Facebook is the most popular social network in the world with a monthly number of active users of over 2 billion. The popularity of social networks is constantly increasing. According to the data, today 2.62 billion users are involved in virtual social networks, and it is expected that in 2019 the number of such users will reach 2.77 billion, and in 2020 – 2.9 billion (Statista, 2018). The social network users every day participate in creating a huge global database by presenting their own and other personal information publicly, and searching for various information. The more people use social networking services, the greater is the likelihood of violations of the rights of the data subject (Šišulák 2017; Menshikov et al., 2017). Malinauskaitė-van de Castel (2017) admits that virtual social networks are among the world's largest personal data administrators who collect, compile, store, use, destroy or perform other actions with the personal data of users. Data administrators determine the purposes and means of personal data processing.

Specifically, updating profile information, posting status updates, sharing photos and videos, and commenting on others' posts - to name a few - are behaviors that reveal aspects of one's personal identity. However, this escalating personal exchange on social networking sites also raises questions about privacy risks and consequences (Fogel, Nehmad, 2009; Zeman et al., 2017; Korauš et al., 2017). Users do not understand the importance of personal data, and voluntarily agree to share their personal information in exchange for third-party applications. Users also lack the knowledge of what rights they have as data subjects in order to ensure the security of their personal data.

Object of the research. Rights of the data subjects of social network. The aim of the article is to analyse the principles and features of the secure administration of personal data in social networks. The following objectives were set for the achievement of the purpose: to examine the theoretical aspects of the protection of personal data; to determine which personal data and how users can publicize on the Facebook network; to provide a model for user interaction with a third-party application; to propose recommendations that would better ensure the protection of personal data of data subjects.

With the development of information technology and electronic services, more and more often personal user data are stored and processed on the internet. Illegal collection and misuse of these data may pose a serious threat to the privacy of such individuals.

2. Personal data administration principles and features of social networks

Westin (1968) defined the right of a person to private life as an opportunity to “control, edit, manage, and delete information about him/her and decide when, how, and to what extent this information could be accessed by other persons”. Parent (1983), when examining privacy, indicates that privacy is possible when personal data are not known or are not confidential. Kang (1998) states that information privacy is realisation of the individual's need to control the conditions under which personal information, which is identifiable to an individual, is received, disseminated or used. At present, privacy is often identified with the protection of personal data. Data protection

is commonly defined as the law designed to protect your personal information, which is collected, processed and stored by “automated” means or intended to be part of a filing system (Privacy International's public engagement platform, 2018).

The Organisation for Economic Co-operation and Development (next – OECD) Guidelines on the Protection of Privacy and Transborder Flows of Personal Data, for the first time established the basic principles of the protection of personal data (Table 1).

Table 1. Basic principles of national application

Principle	Description
Collection limitation	There should be limits to the collection of personal data and any such data should be obtained by lawful and fair means and, where appropriate, with the knowledge or consent of the data subject.
Data quality	Personal data should be relevant to the purposes for which they are to be used, and, to the extent necessary for those purposes, should be accurate, complete and kept up-to-date.
Purpose specification	The purposes for which personal data are collected should be specified not later than at the time of data collection and the subsequent use limited to the fulfilment of those purposes or such others as are not incompatible with those purposes and as are specified on each occasion of change of purpose.
Use limitation	Personal data should not be disclosed, made available or otherwise used for purposes other than those specified in accordance with except: a) with the consent of the data subject; b) by the authority of law.
Security safeguards	Personal data should be protected by reasonable security safeguards against such risks as loss or unauthorised access, destruction, use, modification or disclosure of data.
Openness	There should be a general policy of openness about developments, practices and policies with respect to personal data. Means should be readily available of establishing the existence and nature of personal data, and the main purposes of their use, as well as the identity and usual residence of the data controller.
Individual participation	An individual should have the right: a) to obtain from a data controller, or otherwise, confirmation of whether or not the data controller has data relating to him; b) to have communicated to him, data relating to him within a reasonable time; at a charge, if any, that is not excessive; in a reasonable manner; and in a form that is readily intelligible to him; c) to be given reasons if a request made under subparagraphs(a) and (b) is denied, and to be able to challenge such denial; d) to challenge data relating to him and, if the challenge is successful to have the data erased, rectified, completed or amended.
Accountability	A data controller should be accountable for complying with measures which give effect to the principles stated above.

Source: OECD Guidelines on the Protection of Privacy and Transborder Flows of Personal Data, 1980

The OECD Guidelines are generally universally recognized at international level as a set of privacy protection measures, and they apply to any information related to the data subject. The Dictionary of the European Data Protection Ombudsman's Office describes the data subject as the person whose personal data are collected, stored and processed. Regarding the process of personal data processing, the following basic rights of the data subject can distinguished: (Štítilis et al., 2016):

1. To know (to be informed) about the processing of his/her personal data;
2. To review the personal data, and know how they are processed;
3. To require correction, destruction of the personal data or suspension (except for storage) of the personal data processing operations when the data are processed violating provisions of the law;
4. To give no agreement on the processing of the personal data;
5. To obtain compensation from the administrator for data losses.

The data subject in order to avoid violations related to the personal data should participate as an active participant in the process of personal data protection, and not only as a passive observer of the implementation of personal data protection law. With the entry into force of the European Charter of Fundamental Rights (2012/C 326/02) in 2009, the protection of personal data is included in the list of basic human rights. Part 1 of Article 8 of the Charter states everyone has the right to the protection of personal data concerning him or her. Provisions of Part 2 of Article 8 of the Charter enable data subjects to verify the control of their personal data and the lawfulness of processing: "Such data must be processed fairly for specified purposes and on the basis of the consent of the person concerned or some other legitimate basis laid down by law. Everyone has the right of access to data which has been collected concerning him or her, and the right to have it rectified".

Directive 95/46/EC of the European Parliament and of the Council on the protection of individuals with regard to the processing of personal data and on the free movement of such data (hereinafter – the Data Protection Directive 95/46/EC) lays down the fundamental rights and freedoms of natural persons, and in particular their privacy with regard to the processing of personal data including the virtual social networking environment. Provisions of the Data Protection Directive 95/46/EC do not restrict or prohibit the free movement of personal data between Member States for reasons relating to the protection of personal data. The following regulatory principles established by the Data Protection Directive 95/46/EC can be distinguished:

1. Data quality (article 6). Personal data must be:
 - Processed fairly and lawfully;
 - Collected for specified, explicit and legitimate purposes and not further processed in a way incompatible with those purposes;
 - Adequate, relevant and not excessive in relation to the purposes for which they are collected and/or further processed;
 - Accurate and, where necessary, kept up to date; every reasonable step must be taken to ensure that data which are inaccurate or incomplete, having regard to the purposes for which they were collected or for which they are further processed, are erased or rectified;
 - Kept in a form which permits identification of data subjects for no longer than is necessary for the purposes for which the data were collected or for which they are further processed.
2. Data processing legitimate (article 7). Personal data may be processed only if:
 - The data subject has unambiguously given his consent;
 - Processing is necessary for the performance of a contract to which the data subject is party or in order to take steps at the request of the data subject prior to entering into a contract;
 - Processing is necessary for compliance with a legal obligation to which the controller is subject;
 - Processing is necessary in order to protect the vital interests of the data subject;
 - Processing is necessary for the performance of a task carried out in the public interest or in the exercise of official authority vested in the controller or in a third party to whom the data are disclosed;
 - Processing is necessary for the purposes of the legitimate interests pursued by the controller or by the third party or parties to whom the data are disclosed, except where such interests are overridden by the interests for fundamental rights and freedoms of the data subject.
3. Special categories of data (article 8). Prohibit the processing of personal data revealing racial or ethnic origin, political opinions, religious or philosophical beliefs, trade-union membership, and the processing of data concerning health or sex life, except in certain cases.

As regards online social networks, the document of the Working Party on Data Protection which was set up on the basis of Article 29 of Directive 95/46 / EC – the Opinion No. 5/2009 on the online social networks (hereinafter – "the Opinion") is of utmost importance. The Working Party on Data Protection established by Article 29 of Directive 95/46/EC identifies two main categories of danger to privacy and personal data protection: the lack of

control of data stored by remote computing; lack of information on data processing operations. Users who submit their personal data to social networks or third parties operating in social networks lose control of these data and do not know which tools are used to ensure the availability, confidentiality and integrity of personal data. Consumers due to the lack of data processing information may be exposed to threats and risks as the personal data can be processed by multiple administrators; personal data can be stored in different geographic areas; personal data can be transferred to third parties which may not provide a sufficient level of protection of the personal data.

Summarizing the material presented in the Opinion, the Working Party presents specific guidelines for providers of online social networking services. These can be distinguished:

- Social network service should inform users of their identity, and provide comprehensive and clear information about the purposes and different ways in which they intend to process personal data;
- Social network service should offer privacy-friendly default settings;
- Social network service should provide information and adequate warning to users about privacy risks when they upload data onto the social network service;
- Users should be advised by social network service that pictures or information about other individuals, should only be uploaded with the individual's consent;
- At a minimum, the homepage of social network service should contain a link to a complaint facility, covering data protection issues, for both members and non-members;
- Marketing activity must comply with the rules laid down in the Data Protection and ePrivacy Directives;
- Social network service must set maximum periods to retain data on inactive users. Abandoned accounts must be deleted;
- Users should, in general, be allowed to adopt a pseudonym.

It should be noted that although the opinion of the Article 29 Data Protection Working Party is not legally binding, however, considering the aim of creating a separate legal regulation of online social networks in the future, its contribution is undoubtedly significant. Despite the fact that legal regulation is under the constant pressure to follow the technological progress, and perhaps in general is not able to react in a timely manner to rapid changes, the progress made by the Data Protection Working Party is significant and is likely to continue to be successful (Štitilís et al., 2012).

The Berlin International Working Group on Data Protection in Telecommunications (2008) adopted a document called the Rome Memorandum (hereinafter referred to as "Memorandum"). This is a set of guidelines where, assessing the potential risks of online social networking services, recommendations are also made to the legislator, data controller and individuals using social networking services. The following risks identified in the Memorandum, and related to the use of social networks can be distinguished:

- Data, once published, may stay there literally forever - even when the data subject has deleted them from the "original" site, there may be copies with third parties;
- Users are not openly informed about how their profile information is shared and what they can do to control how it is shared;
- For many providers of social networks user profile data and the number of unique users is the only real asset these companies have, this may create additional risks for proportional collection, processing and use of users' personal data;
- Giving away more personal information than you think you do: For example, photos may become universal biometric identifiers within a network and even across networks;
- Misuse of profile data by third parties: This is probably the most important threat potential for personal data contained in user profiles of social network services.

Recommendations of the Memorandum emphasize that internet social service providers would implement transparent data processing policies, provide an opportunity and encourage users to register by pseudonyms. Particular attention is paid to default privacy settings describing them as playing the essential role in ensuring the user privacy protection measures. Providers of the social network services should ensure prompt cooperation with users who are defending data subject's rights. It is also appropriate to provide disciplinary measures against users who act abusively or otherwise maliciously in the environment of online social network. The social network users should think twice before disclosing personal information, not register on the social networks using their true name and surname, respect the privacy of other users, check privacy policies, and use privacy settings to restrict access to their personal data to the maximum extent possible.

Having analysed the legal regulation of social networks at the international and European level, it is possible to conclude that although there is not yet a special binding regulation on the internet social networks, various non-binding legal acts exist, and are essential for gradual achieving of such a goal. Self-regulation plays a large role. In order to avoid violations related to the personal data, the data subject should be involved in the process of personal data protection as an active participant, and not remain a passive observer of the implementation of personal data protection laws.

3. Personal data of Facebook users on the social network

Facebook is a multi-semiotic media environment where users communicate with text, links, photos, videos, and sound – using different features such as chat, messages, status updates, and the wall (Valtysson, 2012). To register on Facebook social network, the user must submit the following details - name, surname, e. mail or telephone, year of birth, and gender. In addition the data subject shall create the password. The person in the electronic space can be identified by the unique title (name) and password (Štilis et al., 2016). In order to login to the Facebook network, the user must enter the password and e-mail or phone number. Carminati defining the virtual social networks described the following determining features: 1. The internet service based platform where user social links and relations are developed; 2. The users can share interests, likes, activities, and contacts; 3. Each user has the personal account with his/her social contacts, links and other services. Facebook users create a profile page that contains information pertinent to them which can then be viewed by their friends. Such information varies from personal status updates, personal posts and photographs which have either been uploaded by a user or a user's friend. Facebook also provides access to third party applications that a user can add to their page. (Comer et al., 2012). On the virtual social network platform, the operation of services is based on the collection of immense amount of data about the data subject. Information that the user can optionally place on the Facebook social network (Table 2).

Table 2. User data on Facebook

Work and Education	Work. Company (Where have you worked?), Position (What is your job title?), City/Town, Description, Time Period. Education. Professional skills, College, High school – School (What school did you attend?), Time Period, Graduated, Description, Concentrations, Attended for (College or Graduate School).
Places You've Lived	Current city and hometown.
Contact and Basic Info	Contact information. Mobile Phones, Email, Facebook. Websites and social links. Basic information. Birth Date, Birth Year, Gender, Languages, Interested In, Religious Views, Political Views.
Family and Relationships	Relationship. Relationship Status (Single, In a relationship, Engaged, Married, In a civil union, In the domestic partnership, In an open relationship, It's complicated, Separated, Divorced, Widowed). Family Members. Family Member (Daughter, Son, Child, Mother, Father, Sister, Brother,

	Aunt, Uncle, Niece, Nephew, Granddaughter...).
Details About You	About you (Write some details about yourself). Other's names (Add a nickname, a birth name...). Favorite quotes (Add your favorite quotations).
Life Events	Life Events. Work & Education, Family & Relationships, Home & Living, Health & Wellness, Travel & Experiences.
Likes	Likes. Movies, TV Shows, Music, Books, Sports Teams, Athletes, People, Restaurants. Apps and Games...
Other information	Friends, Photos, Videos, Events, Groups...

Source: authors

What information users share with the Facebook social network is an individual choice, some of them alone provide a lot of information about themselves and the whole surrounding reality, and others strive to protect their privacy and publish only minimal information. Facebook is often depicted as a platform to see and to be seen (Pempek et al., 2009), to express an identity (Lee, 2012), and to help highlight otherwise obscure and seemingly mundane aspects of one's life (Yau, Schneider, 2009). For users, it is very important to manage their privacy. The Facebook social network enables its users to decide independently how much and what information to make available to different individuals or interest groups. This is done with privacy settings. Privacy settings are often criticized because of their complex management. It is also possible to identify specific individuals and interest groups with which information will not be shared. Information of the user-generated profiles may be public, semi-public, and private depending on the needs of the user (Table 3).

Table 3. Types of the user data publicity

Public information	Information which is publicly available to all Facebook users.
Closed information	Information which is publicly available to all Facebook users or individual friends and specific interest groups.
Secret information	Information which is available only to the Facebook account administrator.

Source: authors

Once a profile is created, the new user can start looking for friends and send friend requests. When accepted, Facebook connects the two individuals by allowing them to see each other's profile page and by adding their activities to one another's news feed (Caers et al., 2013). Users are encouraged to find their acquaintances and thus expand their virtual network. Early research by Lewis and West (2009) found that users with a large number of Facebook friends do not necessarily have the same number of close friends in everyday life, which supports the claim mentioned above. The most common strategy for privacy protection - decreasing profile visibility through restricting access to friends - is also a very weak mechanism; a quick fix rather than a systematic approach to protecting privacy. Most users do not seem to realize that restricting access to their data does not sufficiently address the risks resulting from the amount, quality and persistence of the data they provide (Debatin et al., 2009).

Joinson (2008) identified seven reasons for using the Facebook social network to help the active Facebook users achieving goals that provide emotional support and information sources:

1. Establishment, maintenance and restoration of social contacts;
2. Group joining, organizing events and communicating with like-minded people;
3. Photo viewing and publicizing;
4. Use of applications – games, gadgets, quizzes, etc;
5. Establishing contacts with people who are not in the electronic space as well as tracking them in order to find out more about them;

6. Browsing the social network by reviewing profiles of people who are not acquaintances;
7. Publication of new information and reviewing of information updated by the other users.

Virtual social networks have changed consumer behaviour, thinking and actions. In the modern world, social networks became a part of everyday activities without which life is hard to imagine. It should be stressed that the Opinion expresses considerable concern about the default privacy settings used for the internet social networks. Only a small percentage of users make any changes to the default settings when registering on the internet social networks. Accordingly, the Working Party considers that online social service providers should provide privacy-friendly default settings enabling users to freely and explicitly allow any access to their profile content beyond the reach of their chosen addressees in order to reduce the risk of unlawful processing of data by the third parties.

4. Consumer interaction with third parties

The virtual social network model is primarily based on the collection and sharing of personal data by the data subject. All of these actions are often accompanied by third parties. As we already know, one of the reasons for using Facebook is applications. Facebook applications are programmes that work in the Facebook environment, use the functions of this social network, and there can be two types of applications, namely those created by the Facebook including events, groups, offers, etc., and those created by the third parties. The Facebook social network has thousands of apps created by the third parties with tens of millions of users for some of them. Users voluntarily share their personal data provided for Facebook in exchange for the third-party services acquired through the Facebook's third-party applications. It is enough to double-click with the button of the "mouse", and an approved (identified) user can already use the services of the website. Not going into details, everything seems quick, uncomplicated, and convenient; however, not all users responsibly evaluate what their personal data are "going" to the third parties providing services. In the case of a Facebook user's standard authentication, if data provided to the third-party are not edited, the user clicking on the "Continue as (User name)" button confirms that he/she agrees to transfer to the third party the maximum amount of personal data that are requested. The problem is that many users due to lack of attention or knowledge or simple laziness share the maximum amount of their personal data. The third-party application administrators selectively determine which personal data will be requested from users, and the public profile data submission is mandatory (Fig. 1).

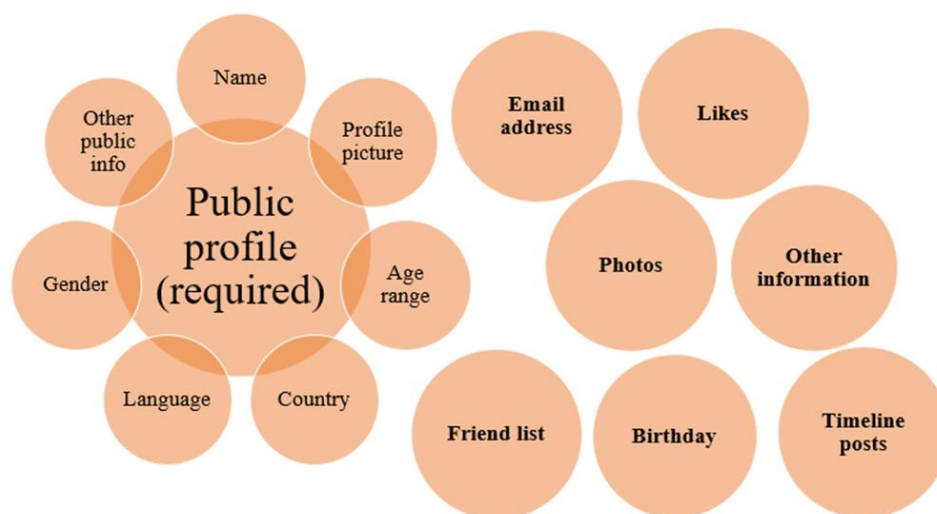


Fig. 1. Third-party may requested personal data from the user

Source: designed by the authors

Hull et al. (2011) suggest visualization enhancements of the third-party apps information accessing and publishing practices. In doing so, users might have a better awareness how the app will use their information and thus users might be able to avoid some undesirable information leakage. Without the user's consent, the third-party applications do not have the right of access to the user's personal data. To limit third-party apps' information access, Facebook primarily relies on the OAuth 2.0 protocol which is used for third-party authentication and authorization. In the traditional client-server authentication model, the client can access a protected resource on the server by authenticating with the server using the resource owner's credentials. OAuth 2.0 adds an authorization layer and separates the role of the client (third-party application) from that of the resource owner (Facebook user) (Hammer-Lahav et al., 2011). The flow of the OAuth 2.0 protocol is shown in Fig. 2.

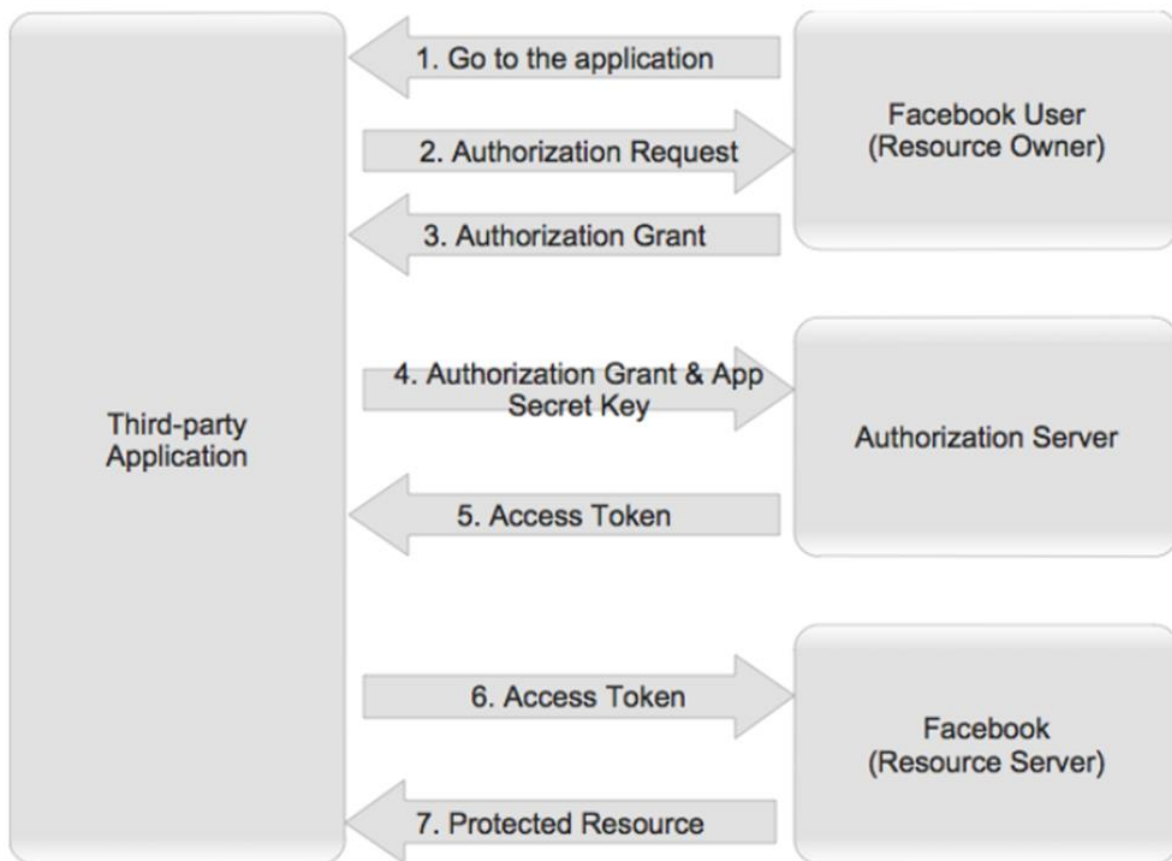


Fig. 2. The flow of the OAuth 2.0 protocol

Source: Wang et al., 2011

Users are interacting, competing, communicating, and entertaining themselves. And their privacy concerns are centered around sharing data with other people on the social network, with almost no understanding of the data sharing that occurs with the application developers. The end result is that there are serious risks of applications maliciously harvesting profile information, and users are not truly understanding and consenting to these risks. (Besmer, Lipford, 2010). Third-party application developers provide social network user privacy policies that specify the terms that the user must accept prior to using the application. Privacy policies are often overlooked due to their complexity and scope. In this case, consumers become vulnerable because they do not know if their

rights of personal data subjects are guaranteed. When a user launches a third-party application, there are three possible scenarios (Fig. 3).

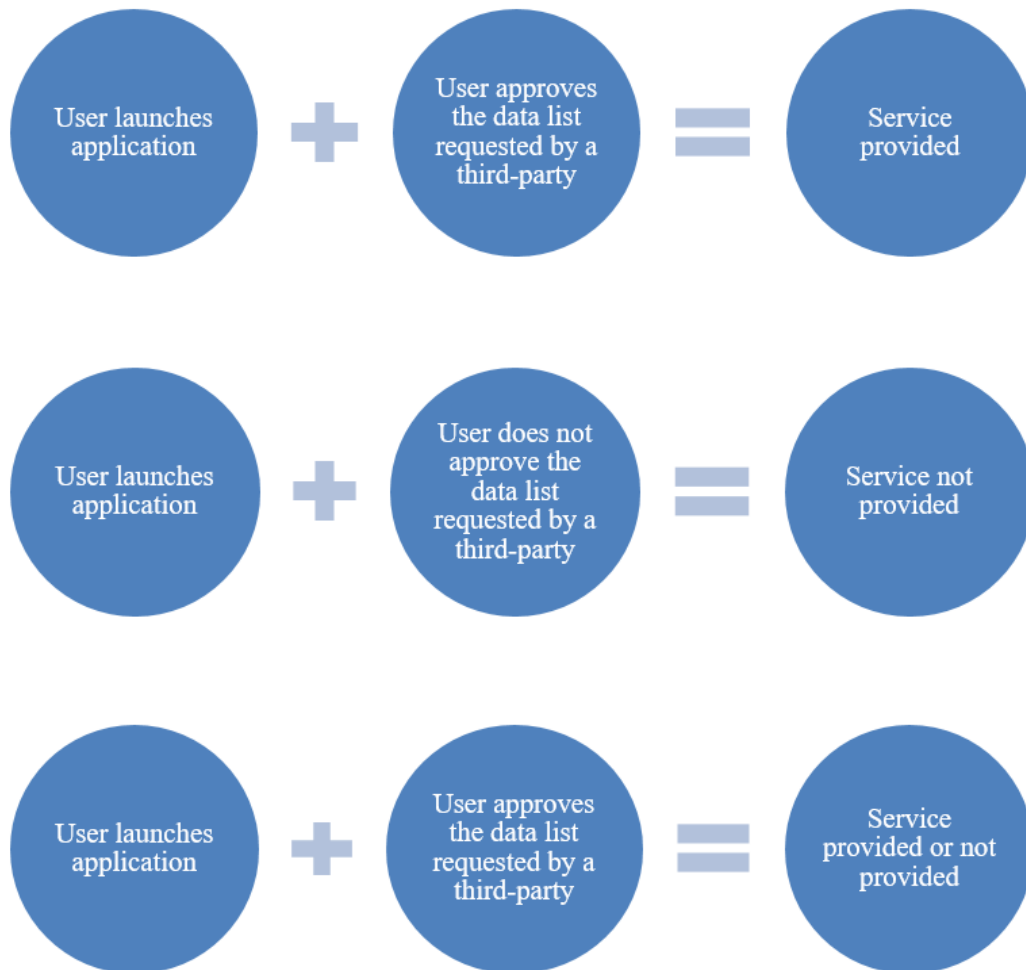


Fig. 3. User and the third-party application interaction model

Source: designed by the authors

Adding to these concerns, a Wall Street Journal study found numerous third-party applications (apps) on Facebook extracting identifiable user information from the platform and sharing this bounty with advertising companies (Steel, Fowler, 2010). The main problem with the virtual social network Facebook, as well as other virtual social networks, is that the purpose of data collection and administration is either obscure or too broadly defined (Karg, Fahl, 2011). Users should focus on the third-party privacy policies and only after thorough review initiate the user identification process. They should not immediately give consent to a third party's request and provide access to the personal data before performing data editing. Editing allows denying access to data that you do not want to share with the third party. Choosing not to provide access to the third party may result in the service denial, in which case it is always possible to repeat the procedure and grant access to the requested data.

Conclusions

Having analysed the legal regulation of social networks at the international and European level, it is possible to conclude that there is not yet a specific binding regulation on the internet social networks; nevertheless various non-binding legal acts are essential for ensuring the security of personal data. Social networks are continually developing and improving their functionality, and addressing various issues related to the protection of user personal data. Self-regulation plays a large role. The data subject should be involved as an active participant in the personal data protection process in order to avoid violations related to the personal data.

Users of various virtual social network services often overlook possible risks or even do not expect them on the virtual social networks. Also a part of the users simply ignore the perceived risks. Users are solely responsible for uploading information on the Facebook social network as well as for the use of third-party applications. Without the user's consent, the third-party applications do not have the right of access to the user's personal data, which is because of the OAuth 2.0 protocol.

Guidance on what actions should be taken or avoided by individual data subjects in order to better ensure the protection of personal data:

1. Do not share on the Facebook the information that could cause damage in case of information leakage or sharing.
2. Use the nicknames instead of your real name and surname registering on the Facebook network. In this way, users will retain their privacy as their true identity is not revealed.
3. Review the default privacy settings of the Facebook and personalize them to ensure enhanced personal data security. The default Facebook settings are customized by the standard for users who are willing to publicize a lot of personal information.
4. Evaluate the reliability of a third-party application before giving access to your personal data. The Facebook social network is a platform providing possibility to operate third-party applications. With a large number of third-party applications, the user has the freedom to choose.
5. Read privacy policies before you start using third-party applications, and note for what purposes the particular website uses personal data from the user and how long the data are stored/ processed; whether the personal data administrator ensures the security of the user's personal data; what terms are for the website privacy policy and service provision changing and what modes for informing the user when they are changed; what responsibility of the website administration is envisaged regarding the service they provide and what risks are being taken by the user of website.
6. Perform editing for personal data in order to avoid the maximum data sharing with third parties during user authentication when you launch a third-party application on the Facebook.

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KNOWLEDGE MANAGEMENT PROCESS MODEL

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Abstract. In the context of globalization and transformations, the knowledge potential management is an effective tool for increasing the effectiveness of organizations. The aim of the research is to study the procedural approach to the organization knowledge potential management, to distinguish the main knowledge management processes and to present suggestions on how to improve the knowledge management process model. The organization's knowledge potential in this study is defined, as the organization's resources and market opportunities, generating its knowledge potential, complexity and effective management of which create prerequisites for meeting the changing individual user needs, creating reciprocal value, uniqueness and leadership in the global marketplace. The conceptual knowledge management process model has been improved, based on the research. The first step in the model is the choice of a knowledge strategy, covering aspects of the formation and selection of strategic decision-making in knowledge potential management. The choice of an appropriate knowledge strategy brings to its implementation through a process of knowledge management cycle, consisting of knowledge acquisition, sharing, development, preservation and application of it. The knowledge management process model is completed with an evaluation of the knowledge strategy implementation.

Keywords: knowledge management, organization knowledge potential, knowledge management processes, procedural approach

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1. Introduction

The society transformation into the knowledge society is changing user information and knowledge needs. The organizations, seeking to effectively meet changing user needs, are no longer equipped with knowledge, abilities and skills to manage traditional resources; there is also a need for effective organization knowledge potential management. How to efficiently manage the organization's knowledge potential in a dynamic and uncertain environment in the presence of limited organization resources for the sake of uniqueness and leadership in the market is a problem, investigated in the knowledge management discipline and realized through a process

knowledge management cycle that creates preconditions for creating mutual value for both users and members of the organization.

The knowledge potential managing and evaluating aspects are relevant to improving the performance of organizations, but the age of information and knowledge is characterized by a dynamic environment; uncertainty is crucial to the uniqueness of organizations, where speed and quality become one of the key factors in effectively meeting the changing individual user needs. Organizations need to adapt quickly and efficiently to changing environmental conditions by effectively managing their knowledge potential. The poor decision-making and performance of knowledge potential management has negative consequences. Therefore, one of the key research objects in a dynamic and uncertain environment is how to integrate the organization knowledge potential.

The aim of the research is to investigate the procedural approach to the organization knowledge potential management, to distinguish the main knowledge management processes and to submit suggestions on how to improve the knowledge management process model. The knowledge management process model has been improved, based on integrated knowledge management model, studied by Probst, S. Raub, and K. Romhardt (2000) and consisting of eight processes: knowledge goals, identification, acquisition, development, distribution, preservation, use and measurement. The purpose of the research was to obtain scientific literature analysis, systematic analysis, comparative analysis, synthesis methods.

2. The organization knowledge potential management concept

Globalization, changes in the technological, social, cultural, economic, legal environment, transition from information to knowledge society affects not only user needs, changes in organizational management models in a dynamic and uncertain environment, but also changes in social sciences, when the analysis of the organizational advantages and risk management issues becomes complex, as well as integrated evaluation approaches and methods are needed to investigate it. For the organization's uniqueness and leadership in the global marketplace, it is important to know the specifics of managing and evaluating its knowledge potential (Alavi & Leidner, 2001; Coyte, Ricceri, & Guthrie, 2012; Fink, 2004, 2011; Firlej & Žmija, 2017; Girish, Joseph, Roy, & Raju, 2015; Huang, Quaddus, Rowe, & Lai, 2011; Hunitie, 2017; Lin, 2014; Rath, Given, & Forcier, 2016; Saufi, Rusuli, Tasmin, & Takala, 2012; Schwen, Kalman, Hara, & Kisling, 1998; Starnawska, 2014; Stewart, 1997; Wong, 2005; Šafránková & Šikýř, 2017; Grenčíková et al., 2017).

The knowledge potential management and evaluation problem is discussed in the knowledge management discipline. Knowledge management is an emerging science discipline, integrating cognitive sciences, philosophy, sociology, psychology, information science, communication, document management, information management, information and communication technologies, management and economic theories, strategic management, change management, human resource management, organization learning, knowledge engineering, artificial intelligence and more (Fink, 2011; Kebede, 2010; Mciver & Lepisto, 2017; Schwen et al., 1998; Raudeliūnienė & Meidutė-Kavaliauskienė 2016; Rajnoha et al., 2017). Scientists provide a variety of knowledge management definitions (Alavi & Leidner, 1999; Cheng & Leong, 2017; Gao, Li, & Clarke, 2008; García-Fernández, 2015; Kianto, Vanhala, & Heilmann, 2016; Magnier-Watanabe & Senoo, 2010; Massingham, 2014; Wiig, 2007; Yahya & Goh, 2002).

Knowledge management is defined, as dynamic (García-Fernández, 2015) and a systematic process (Alavi & Leidner, 1999; Wiig, 2007) or set of processes (Cheng & Leong, 2017) for controlling knowledge workers (Gao et al., 2008), as knowledge management (Massingham, 2014) for gaining, organizing, communicating to accumulate, create, store, share, distribute and realize vague knowledge inside and outside of it (Alavi & Leidner, 1999; García-Fernández, 2015; Kianto et al., 2016; Magnier-Watanabe & Senoo, 2010), so that other employees

can use it and be more efficient and productive at work (Alavi & Leidner, 1999), more effective decision-making and adaptation in the market (Yahya & Goh, 2002), more effective achievement of goals (Cheng & Leong, 2017; Magnier-Watanabe & Senoo, 2010).

Summarizing various scientific opinions, knowledge management is defined, as targeted and systematic management of processes, methods and tools, making full use of the organization's knowledge potential for strategic goals, making effective decisions, implementing and creating its value (Raudeliūnienė, 2017).

The knowledge potential concept is evaluated by scientists from different levels: individual, employee, organization, state (Bivainis & Morkvėnas, 2010, 2012; Fink, 2004, 2011; Fink & Roithmayr, 2005; Jang, Yang, & Hong, 2014).

K. Fink et al. (2004, 2005, 2011) measure the knowledge potential by the knowledge prestige of the knowledge worker, his abilities, experience, gained through the learning process. Knowledge potential is seen, as identifying, distributing and implementing inaccurate knowledge for the strategic goals of the organization. The knowledge worker's knowledge potential includes user's capital, network and communication capability, competitor information, knowledge content and culture, learning and training processes, knowledge management systems, organization knowledge structure and assessment of inexperienced knowledge of experts. The key to knowledge management is to help a knowledge worker transform his knowledge potential into a visible organization. K. Fink et al. (2004, 2005, 2011) measure knowledge potential by the mass of knowledge (human factors), position (organizational and environmental factors) and speed (problem solving quality and speed) (Fink, 2004, 2011; Fink & Roithmayr, 2005).

Through extensive research, related to the assessment of the organization's knowledge potential, J. Bivainis, R. Morkvėnas (2010, 2012) argue that not only the definition of the organization's knowledge potential concept, but also the complex approach and evaluation methods, related to the assessment of the organization's knowledge potential, are absent. J. Bivainis, R. Morkvėnas (2010, 2012) define the organization knowledge, as a whole, using the concept of knowledge potential, which includes both explicit and fuzzy knowledge and additional synergies, arising from the interaction of organizational elements (Bivainis & Morkvėnas, 2010, 2012).

J. Jang, J. Yang, and A. Hong (2014) value the knowledge potential through the mass of knowledge, the speed and position and the interaction between them, which influences the knowledge creation process. The scientists believe that the largest is the knowledge potential, the more knowledge is created (Jang et al., 2014).

The organization's knowledge potential in this study is defined, as the organization's resources and market opportunities, generating its knowledge potential, complexity and effective management of which create prerequisites for meeting the changing individual user needs for information and knowledge, creating reciprocal value, uniqueness and leadership in the marketplace.

3. Process approach to managing organization knowledge potential

How to efficiently manage knowledge potential in a dynamic environment under conditions of uncertainty, which management and evaluation problems are faced with risk reduction and the development and implementation of high-quality solutions - will be explored by integrating various insights from the scientists, related to the procedural approach to managing organization knowledge potential.

The scientists (Armistead, 1999; Becerra-Fernandez, Gonzalez, & Sabherwal, 2004; Bigliardi, Galati, & Petroni, 2014; Dalkir, 2011; Franco & Mariano, 2007; García-Fernández, 2015; Kianto et al., 2016; Lin & Lee, 2005;

Lytras, Pouloudi, & Poulymenakou, 2002; Nayır & Uzunçarılı, 2008; Nielsen, 2006; Pinho, Rego, & Pina e Cunha, 2012; Probst, Raub, & Romhardt, 2000; Rollett, 2003; Raudeliūnienė et al., 2016; Staab, Studer, Schnurr, & Sure, 2001; Sun, 2010; Supyuenyong, Islam, & Kulkarni, 2009; Wee & Chua, 2013; Yusr, Mokhtar, Othman, & Sulaiman, 2017) distinguish different combinations of knowledge management processes in approaching the knowledge management process (Table 1).

According to C. Armistead (1999), knowledge management processes are defined, as processes, knowledge is created, captured and codified, shared and transmitted, consolidated and used, measured and evaluated in. The scientist analyzed three key knowledge management processes: knowledge creation, knowledge transfer and knowledge embedding (Armistead, 1999).

G. Probst, S. Raub, K. Romhardt (2000) developed an integrated knowledge management system that includes such processes, as knowledge goals, identification, acquisition, development, distribution, preservation, use and measurement. In identifying knowledge, it is assessed, which essential competencies are necessary to achieve the organization goals. The knowledge identification process examines the knowledge gap to achieve the goals. In acquiring knowledge, decisions are made on how to eliminate knowledge gaps and to acquire the necessary competences. The knowledge development process involves the acquisition of new competences and new knowledge development. The knowledge dissemination and sharing process is aimed at sharing knowledge and ensuring access to knowledge-based activities. The essence of the knowledge process is the use of effective organization knowledge to achieve its goals. It is important to select, accumulate and update knowledge in preserving it in order to avoid the loss of valuable knowledge. The knowledge assessment examines the effectiveness of knowledge management activities and changes in the knowledge base (Probst et al., 2000).

S. Staab, R. Studer, H.-P. Schnurr, and Y. Sure (2001) presented ontology-based knowledge management approach and a knowledge management cycle, consisting of such processes, as: knowledge creation or import; capture; retrieval or access; and use (Staab et al., 2001).

M. D. Lytres, A. Pouloudi, A. Poulymenakou (2002) propose an advanced knowledge management process cycle, consisting of such processes, as: knowledge relate/value (identify, verify, filter, select); acquire (formalize, codify, represent, format, map); organize (store, transform); enable reuse (adapt, create); transfer (share, distribute, forward, link to people) and use (apply, integrate, learn) (Lytras et al., 2002).

H. Rollet (2003) investigated the following knowledge management processes: knowledge planning, creating knowledge, integrating knowledge, organizing knowledge, transferring knowledge, maintaining knowledge and assessing knowledge (Rollett, 2003).

I. Becerra-Fernandez, A. Gonzalez, R. Sabherwal (2004) integrated I. Nonaka (1994) (socialization, externalization, internalization, combination), R. M. Grant (1996), J. Nahapiet, S. Ghoshal (1998) (Grant, 1996; Nahapiet & Ghoshal, 1998) empirical research results and distinguished four knowledge management processes: knowledge discovery, capture, sharing and application (Becerra-Fernandez et al., 2004).

H. F. Lin, G. G. Lee (2005) focused on the impact of learning opportunities (training available, technical expertise, and knowledge level) and knowledge acquisition (knowledge acquisition, knowledge application, and knowledge sharing) on e-business system adaptation. The research results showed that organizational learning factors and knowledge management processes are closely related to e-business system deployment level. However, the knowledge sharing process did not have a significant impact on e-business system deployment in the organisation (Lin & Lee, 2005).

A. P. Nielsen (2006) integrated knowledge management research into a dynamic capability approach, involving three knowledge management processes: knowledge development (acquisition, capture), knowledge (re)combination (assembly, sharing, integration) and knowledge use (leverage, exploitation) (Nielsen, 2006).

The purpose of the study by M. Franco, S. Mariano (2007) was to assess the impact of information technology repositories on knowledge management processes - knowledge storage and retrieval. The study found that factors affect the knowledge retrieval process from the perspective of information technology repositories and that the storage process was related to three different events, occurring before, during and after the repository delivery to the organization (Franco & Mariano, 2007).

D. Z. Nayır, U. Uzunçarşılı (2008) analyzed how effective knowledge management practices together with a unique business culture allowed the organization to become extremely successful; in his research, he investigated three knowledge management processes: knowledge acquisition, knowledge sharing and knowledge utilization (Nayır & Uzunçarşılı, 2008).

V. Supyuenyong, N. Islam, U. Kulkarni (2009) analyzed how the knowledge management process affects the knowledge management process: knowledge and process creation; knowledge organization and retention; knowledge dissemination; knowledge utilization. The research results showed that the ownership and management structure, cultural and behavioral characteristics have a positive effect in comparison with other analyzed characteristics for knowledge management processes. Systems, processes and procedures, user and market features have more, than an average impact. Human capital management, rather interferes with, than facilitates knowledge management processes (Supyuenyong et al., 2009).

P. Sun (2010) analyzed how the organization's routine affects knowledge management processes: knowledge acquisition; knowledge creation; knowledge utilization and sharing. Knowledge acquisition involves processes, knowledge is acquired in from external sources; knowledge creation is the transformation of newly acquired knowledge into the context of an organization, and the application of knowledge and sharing of it is the constant use of newly created knowledge and sharing of it between individuals or groups (Sun, 2010).

K. Dalkir (2011) integrated empirical research results (Bukowitz & Williams, 2000; Mcelroy, 1999; Meyer & Zack, 1996; Rollett, 2003; Wiig, 1993) and distinguished the following knowledge management processes: knowledge capture and codification, knowledge sharing and dissemination, knowledge acquisition and application (Dalkir, 2011).

I. Pinho, A. Rego, M. Pina e Cunha (2012) identifies barriers and opportunities (through technological, social, organizational and individual prism) for the following four knowledge management processes: knowledge acquisition, creation, sharing, and transfer (Pinho et al., 2012).

J. C. N. Wee, A. Y. K. Chua (2013) examined the peculiarities of the following three knowledge management processes that are unique to small and medium-sized organizations: knowledge creation, knowledge sharing and knowledge reuse. The research results showed that knowledge creation is innovative individual solutions for meeting the needs of users; knowledge sharing takes place through cross-functionality, matching roles and facilitates this process through close physical closeness to open workplaces; knowledge reuse is often performed in an unrepresentative form, where general knowledge is most often included in processes (Wee & Chua, 2013).

Table 1. The spectrum of knowledge management processes

Author, year/ Process	Knowledge goals, planning	Identificate, relate	Discovery, search, retrieval, access, localization, capture	Acquisition	Creation, development, generation	Distribution, dissemination, sharing, transfer, user achievement	Organization	Preservation, capture, archiving	Codification	(Re)combination	Use, utilization, integration, embedding, enable reuse	Measurement, revision, feedback
Armistead 1999					+	+					+	
Probst et al. 2000	+	+		+	+	+		+			+	+
Staab et al. 2001			+/+		+						+	
Lytras et al. 2002		+		+		+	+				+/+	
Rollet 2003	+				+	+		+			+	+
Becerra- Fernandez et al. 2004		+	+			+					+	
Lin et al. 2005				+		+					+	
Nielsen 2006					+					+	+	
Franco et al. 2007			+					+				
Nayır et al. 2008				+		+					+	
Supyuenyong et al. 2009				+	+	+	+	+			+	
Sun 2010				+	+	+					+	
Dalkir 2011			+	+	+	+					+	
Pinho et al. 2012				+	+	+/+						
Wee et al. 2013					+	+					+	
Bigliardi et al. 2014					+	+		+				+
García- Fernández 2015					+	+		+			+	
Kianto et al. 2016				+	+	+		+	+			
Yusr et al. 2017				+		+					+	

Source: created by Authors

Research of B. Bigliardi, F. Galati, A. Petroni (2014) confirmed that there is no general and unique knowledge management system in the organizations examined. This means that the examined organizations apply different knowledge management processes about the specifics of the activities carried out. The researchers highlighted two basic similarities among the 14 organizations surveyed: knowledge management process is cyclical in all organizations; the organizations investigated apply the following key knowledge management processes: (1)

creation, search and capture of knowledge; (2) organization, storage and preservation of knowledge; (3) distribution, transfer and sharing of knowledge; (4) feedback stage (Bigliardi et al., 2014).

Based on 78 sources, M. García-Fernández (2015) analyzed knowledge management processes and highlighted these processes and their factors that were most often investigated by researchers: knowledge creation (acquisition of information, information dissemination, shared understanding), knowledge transfer and storage (knowledge storage, knowledge transfer in the organization, application and use of knowledge (teamwork, empowerment, commitment to knowledge) (García-Fernández, 2015).

A. Kianto, M. Vanhala ir P. Heilmann (2016) analyzed the following five knowledge management processes: knowledge acquisition, sharing, creation, codification and retention. Knowledge creation means the organization's ability to create new and useful ideas and solutions, related to the various aspects of organizational activity, from products and technological processes to management practices. Knowledge codification consists of the activities, necessary to transform the inexpressible knowledge into expressive knowledge, to preserve formalized knowledge and to provide the latest registered knowledge to the organization employees. The effectiveness of this process depends on the competence and motivation of the employees and the information and communication technology infrastructure. Knowledge preservation relates to the management of human resources in order to reduce the loss of expertise in the organization (Kianto et al., 2016).

M. M. Yusr, S. S. M. Mokhtar, A. R. Othman, Y. Sulaiman (2017) distinguished the following three knowledge management processes that influence innovation: knowledge acquisition, knowledge dissemination and knowledge application. According to the scientists, these knowledge management processes (the process of gaining valuable knowledge, disseminating this knowledge in the organization, timely delivery and commercial application) are important in order to improve the organization's innovative results (Yusr et al., 2017).

Summarizing the knowledge management processes, studied by Armistead, 1999; Becerra-Fernandez, Gonzalez, & Sabherwal, 2004; Bigliardi, Galati & Petroni, 2014; Dalkir, 2011; Franco & Mariano, 2007; García-Fernández, 2015; Kianto et al., 2016; HF Lin & Lee, 2005, Lytras, Pouloudi, & Poulymenakou, 2002; Nayır & Uzunçarlı, 2008; Nielsen, 2006; Pinho, Rego, & Pina e Cunha, 2012, Probst, Raub, & Romhardt, 2000; Rollett, 2003; Staab, Studer, Schnurr, & Sure, 2001; Sun, 2010; Suppyuenyong, Islam, & Kulkarni, 2009; Wee & Chua, 2013; Yusr, Mokhtar, Othman, & Sulaiman, 2017, it was found that most scientists are investigating such essential knowledge management processes, as (Fig. 1):

- (1) knowledge distribution, dissemination, sharing, transfer, user achievement (27 per.);
- (2) knowledge use, utilization, integration, embedding, enable reuse (25.4 per.);
- (3) knowledge creation, development, generation (20.6 per.);
- (4) knowledge acquisition (15.9 per.);
- (5) knowledge preservation, capture, archiving (11.1 per.).

The scientific literature analysis has shown that knowledge management processes, studied by most scientists, do not have a clear knowledge management structure and feedback aspects, important in assessing the model of knowledge management process, involving the process cycle beginning and stages of its completion.

According to García-Fernández (2015), several studies have been conducted on knowledge management processes from a different perspective, but it is difficult to identify and measure knowledge management processes because there is no consensus on the dimensions of the assessment of knowledge management processes, which necessitates the creation of an integrated knowledge management model (García-Fernández, 2015).

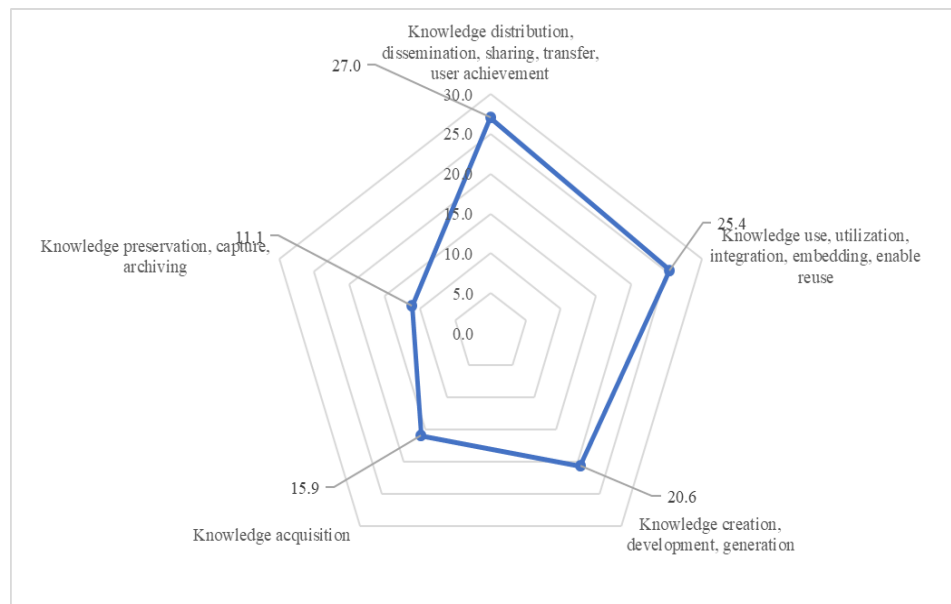


Fig. 1. Distribution of knowledge management processes (per.)

Source: created by Authors

For these reasons, for further research purposes, to improve the knowledge management process model, knowledge management cycle of Probst, S. Raub, and K. Romhardt (2000) has been chosen for the development of a more structured and advanced knowledge management structure, from the identification, acquisition, development, sharing and dissemination of knowledge objectives, application, preservation and knowledge assessment.

4. Aspects of improving the knowledge management model

Globalization, technological advancement challenges, environmental dynamics, changes in public knowledge needs and behaviors and the associated transformation from the information society to the knowledge society, structural changes in organizational management shape the need for a comprehensive knowledge strategy development and implementation through a process knowledge management model.

Based on the research, based on an integrated knowledge management system, proposed by Probst, S. Raub, and K. Romhardt (2000), which includes eight knowledge management processes – knowledge goals, identification, acquisition, development, distribution, preservation, use and measurement –, the defects of the model were identified in relation to the knowledge strategy formation, process consistency and complexity assessment aspects.

The main problem of the integrated knowledge management system, proposed by Probst, S. Raub, K. Romhardt (2000), is the formation of a knowledge strategy that must be implemented through process knowledge management. The model of Probst, S. Raub, and K. Romhardt (2000) offer two successive stages – knowledge goals and identification. At the beginning, the knowledge goals are set, then the knowledge-based process is passed, which focuses on assessing, which competences (knowledge, skills) are lacking in achieving the goals. In this case, the methods and tools, based on the formation of knowledge goals, are lost, and the following question

arises: how an organization, which did not evaluate its position on the outside and the available internal resources, can qualitatively formulate the strategic knowledge potential management goals.

The integrated knowledge management system, proposed by Probst, S. Raub, and K. Rahnardt (2000), identifies the shortcomings, related to process consistency, as the knowledge retention process in the model takes place after the process of applying knowledge. Then the question arises on how to apply the organization knowledge, if it is not saved. To solve this problem, it is proposed to complete the knowledge preservation process by acquiring, sharing and creating knowledge in the organization.

The integrated knowledge management system, proposed by Probst, S. Raub, and K. Romhardt (2000), lacks complex approaches and evaluation methods for analyzing organizational knowledge management processes in a dynamic environment, there is a constant change and the associated uncertainty in. Therefore, to formulate high-quality strategic decision-making on managing knowledge potential, the complex task of the organization's external and internal factors and the search of methods, which help to analyze the problem areas of the knowledge management process and seek ways to eliminate them, becomes an important task.

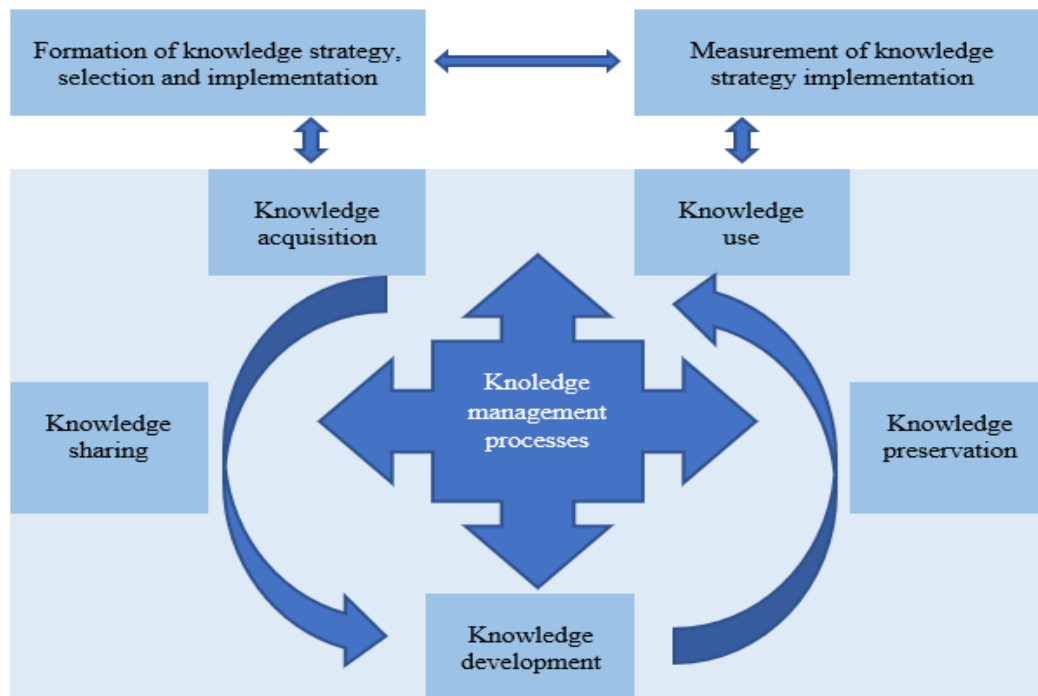


Fig. 2. Improved conceptual knowledge management process model

Source: created by Authors (according Probst et al., 2000; Raudeliūnienė, 2017)

Regarding the shortcomings, identified in the integrated knowledge management system of Probst, S. Raub and K. Romhardt (2000), it is proposed to improve the knowledge management process model from the choice of knowledge strategy - formation, selection and management of strategic decision-making in knowledge potential management through the knowledge management process, consisting of knowledge acquisition, sharing, development, preservation and application. The knowledge management process model is completed with an evaluation of the knowledge strategy implementation (Fig. 2).

The external and internal factors, affecting knowledge potential, are evaluated during the formation, selection and implementation of the knowledge strategy. The strengths and weaknesses identified, based on the research results, identifying the organization's position in the market and choosing a knowledge strategy, which forms the basis of the strategic decision-making process for the knowledge strategy implementation through a process knowledge management model.

Conclusions

The conceptual knowledge management process model has been improved, based on the research. The following general conclusions and recommendations are formulated in the development of the model.

In the context of transformations, the knowledge potential management is an effective tool for improving the efficiency of organizations. Effective organization knowledge potential management influences the entire organization's knowledge creation value chain by creating the preconditions for finding out the changing needs of the user and for the purposeful development of the organization's knowledge potential to meet the needs to create a reciprocal value, i. e. through the perception of individual needs of users to form unique solutions, implementation of which creates value for the user through satisfaction of needs and communication, for the organization loyalty, uniqueness and leadership.

The organization's knowledge potential in this study is defined, as the organization's resources and market opportunities, generating its knowledge potential, complexity and effective management of which create prerequisites for meeting the changing individual user needs, creating reciprocal value, uniqueness and leadership in the global marketplace.

The process knowledge management model, proposed by the organization to manage the knowledge potential, forms a process cycle and the knowledge creation value chain. Scientific literature presents different approaches to knowledge management processes and their range. The scientific literature analysis revealed that scientists are most often researching the processes of knowledge sharing, application, development (creation), acquisition and preservation. However, the knowledge management processes, analyzed by the scientists, do not have clear knowledge of the course, sequence, structure and feedback aspects of knowledge management, which is important in assessing the knowledge management process model, involving the start of the process cycle and its completion. The assessment of knowledge management processes is based on different approaches; therefore, it is difficult to measure knowledge management processes and, as a result, there is a need to develop an integrated knowledge management model. For these reasons, the integrated knowledge management cycle of G. Probst, S. Raub, K. Romhardt (2000) on the identification of the knowledge management progression, starting with the identification of knowledge goals, was chosen for further research and improvement of the knowledge management process model, acquisition, creation, sharing and distribution, application, preservation and evaluation.

After examining the integrated knowledge management system, developed by G. Probst, S. Raub, K. Romhardt (2000), the shortcomings of this model were identified with the formation of knowledge strategy, process coherence and complexity assessment aspects. Regarding the shortcomings, identified in the integrated knowledge management system of G. Probst et al. (2000), it is proposed to improve the conceptual knowledge management process model from the choice of knowledge strategy – formation, selection and management of strategic decision-making in knowledge potential management through the knowledge management process, consisting of knowledge acquisition, sharing, development, preservation and application. The knowledge management process model is completed with an evaluation of the knowledge strategy implementation.

Further research trends could be linked to the assessment of the relationship between knowledge management process model variables and their impact on the effective knowledge potential management and the effectiveness of the organization's activities.

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MARKET PECULIARITIES OF NATURAL GASS: CASE OF THE PACIFIC REGION

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Abstract. In this article are considered by authors the technological, resource and economic capacity of the Far East, the first stages of a cooperation between Russia and the largest gas importers in the Pacific Rim are described, the main projects and fields contributing to the development of a cooperation between the countries are also considered. Statistical methods of the analysis act as methodological base of a research. In modern conditions in relation to the energy sector of Russia (imposition of sanctions by the western countries) there is a reorientation of export deliveries to the EU to Asia-Pacific countries. In these conditions the Far East of Russia acts as a large oil and gas source which has advantages and opportunities to compete in the Asian market, using not only the favorable investment climate, but also the infrastructure developed for today's time. The carried-out analysis showed that Russia is the largest suppliers in the market of Asia-Pacific countries. Constantly interest in the Russian energy resources in the Asian market grows. It is connected with a geographical location of Russia, with high inventories of hydrocarbons in the Far East, safety of deliveries, low policy risks, etc.

Keywords: natural gass, market, Asia-Pacific countries, Russia, projects, competition, import, consumption

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JEL Classifications: Q31, Q41

1. Introduction

Availability and affordability of energy are just several facets of energy security of any country (e.g. Tvaronavičienė et al. 2017; Melas et al. 2017). Growing demand on energy makes those issues even more urgent.

The gas consumption in Asia-Pacific countries increases prompt rates. For the last 10 years demand for energy resources increased by 6% (more than twice). According to forecasts, demand in China by 2030 will increase to 240 billion cubic meters from which more than a half will be imported. In addition to China, demand will increase in India, South Korea and Japan. Cost value of production and gas transportation of the acting suppliers in Asia-Pacific countries obviously differ. Owing to limitation of a possibility of building-up of own inventories, the energy policy of Asia-Pacific countries is aimed at the development of a cooperation with gas exporting countries: Russia, Australia, Indonesia, countries of the Middle East. However considering transportation distance, level of cost of resources, the number of infrastructure projects, there is a question: what gas will be competitive in this market?

2. Analytical part

The share of Russia in the world market of gas doesn't exceed 5%, however the state energy strategy provides increase in an indicator up to 12% by 2035 of the total amount of the world market. It will become possible only in case of a gas production growth in volumes twice in comparison with the indicator fixed in 2016 (Ttable 1).

Table 1. Gas production in Russia, billion cubic meters

Year	Gas production, billion cubic meters
2010	650,7
2011	670,7
2012	654,5
2013	668,2
2014	641,9
2015	635,5
2016	640,7

Source: <http://minenergo.gov.ru/node/1215>

In Russia there is a set of large projects which purpose to expand presence of Russia in the world market of natural gas. One of them – "Sakhalin II" (Sakhalin Energy) which shareholders are Gazprom (50%), Shell (27,5%), "Mitsui" (12,5%) and Mitsubishi (10%). Two processing lines annually receive about 14,9 billion cubic meters of liquefied natural gas, 11 million tons which it is exported to the countries of Asia-Pacific region. In 2015 it became known that Sakhalin Energy plans to construct the third processing line capacity to 5,4 million tons/year. The company signed development agreements of the project with the Shell Global Solutions International company and the Russian design institute "Giprogaftsentr".

“Yamal LNG” the project which is at an implementation stage which capacity reaches 16,5 million tons/year, it is created in a cooperation with the companies: Total and CNPC-of 20%, Silk Road Fund-9, 9 % (Kutuzova, 2016). Strategically advantageous position of the project, according to many experts, will allow to export the extracted gas not only to Europe, but also to Asia-Pacific countries. In 2014 the project faced a financing problem. Investment attraction became complicated after entering of the USA of sanctions. However, at the end of 2014 the project received 150 billion rubles from “National welfare fund” which purchased the issued bonds “Yamal - LNG”. In 2015 the “Novatek” company agreed with the Chinese “Fund of the Silk way” about provision of a loan about 730 million euros for financing of a construction. After the loan agreement the fund of China acquired 9% of shares of Yamal LNG. According to the head of the Novatek company Leonid Mikhelson: “Signing of binding documents selling a share in the project of “Yamal LNG” is an important step to implementations of our long-term development strategy. As a result of closing of the transaction we will reach target structure of shareholders which is optimum and will promote planned financing of the project and its further successful implementation”^{*}.

“Rosneft” company together with “ExxonMobil” realizes the project on gas production - “The Far East LNG”. The project startup in operation is planned for 2018 - 2019. According to some information, the design capacity will make 5 million tons/year, which source of raw materials will form - fields of the “Sakhalin-I” project and inventories of “Rosneft” in the Far East. Within only the “Sakhalin-I” project about 7 billion cubic meters of natural gas are extracted, having realized the project and using inventories in the Far East, the company will increase a production indicator at least twice.

It is more than a half of the territories of Eastern Siberia and the Far East have extensive inventories of hydrocarbons. In Eastern Siberia geological inventories are estimated at 92,2 billion tons. In this territory 68 fields were found (from them five “unique” fields which inventories exceed 300 million tons or 500 billion cubic meters). According to prospecting services, in a subsoil of the region there is an equal amount of oil and gas, however on the taken resources gas (80%) prevails. Despite this percentage ratio, calculations of the companies show that resource base of oil of Eastern Siberia in case of the correct operation and further development, is capable to provide oil extraction by 2020 approximately on 50 million tons in a year.

In the Far East geological inventories are estimated at 18,9 billion tons, annual gas production in this territory constitutes more than 1,5 billion cubic meters. Oil extraction is conducted since 1923 therefore extent of exploration of resources reached 55%, and amounts of the extracted oil make 2,7 million tons. The main resources of the Far East are located on the water area: “North - Sakhalin” shelves and “Magadansk - West - Kamchatka”. The largest projects in the Far East are “Sakhalin –I” and “Sakhalin-II” which provide up to 50% and more oil extraction and higher than 83% of production of LNG. The further prospect of development of natural gas production is connected with a construction of a trunk gas pipeline “Force of Siberia” as which resource base earlier not researched “Chayadinsky” field will act. Oil refining is performed in two largest oil refineries in the Far East – “Komsomolsk Refinery” and “Khabarovsk refinery”. General capacity of the plants on data of 2016 left 12,9 million tons. However, in the territory the unique gas liquefaction plant – “Sakhalin –2” which capacity is higher than 9,6 million tons functions. Thus, the structure mineral – source of raw materials of the Far East allows to gain steam in volume of production which part will be directed to export to Asia-Pacific countries.

^{*} Novatek and Fund of the Silk Way signed final binding agreements on the project of Yamal LNG. [Online] Available: <https://neftrossii.ru/content/novatek-i-fond-shelkovogo-puti-podpisali-okonchatelnye-obyazyvayushchie-soglasheniya-po-proektu-yamal-spg> (November 24, 2017)

3. Results of the research

In Asia - Pacific region there are five largest gas importers: China, Japan, India, Korea and Taiwan. In three years the indicator of natural gas import considerably grew: in China for 0,8%, in Japan for 0,95%, in South Korea for 1,05% (see Figure 1).

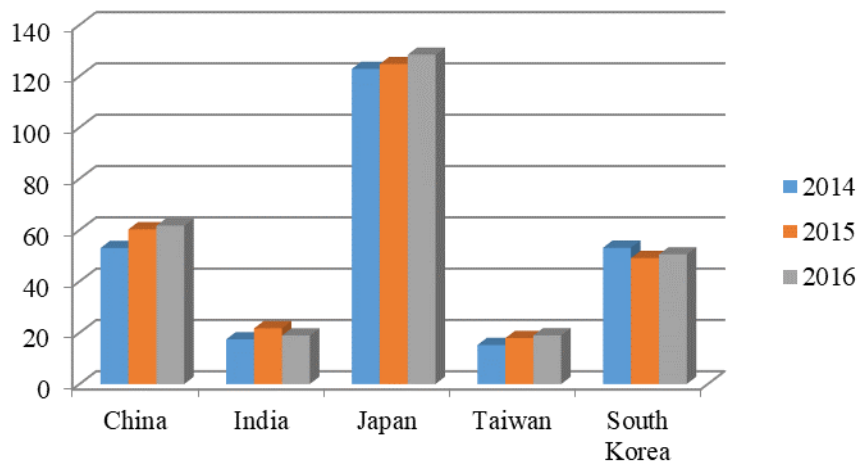


Fig. 1. Natural gas import, billion cubic meters
Source: <https://www.eia.gov/beta/international/>

South Korea is the country dependent on LNG supply, considerably increasing a consumption indicator every year. For India gas import allows to reduce deficit between amount of the consumed and made gas. The energy policy of China optimizes structure of energy industry towards gradual increase in a share of natural gas and also a flared cooperation with Russia recently (see Figure 2).

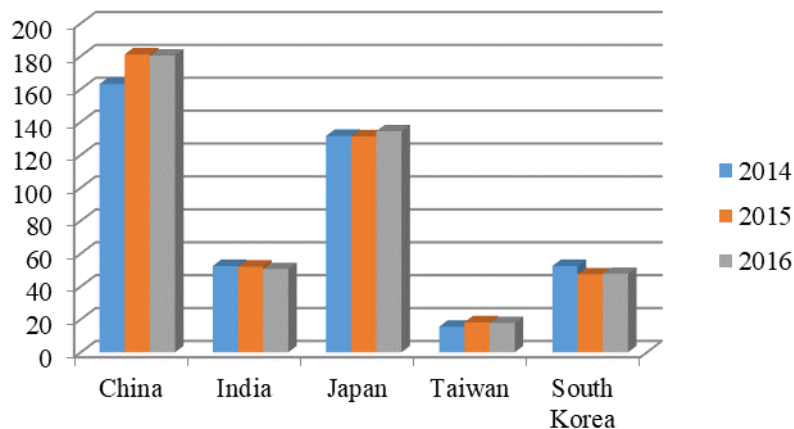


Fig. 2. Consumption of natural gas, billion cubic meters
Source: <https://www.eia.gov/beta/international/>

As a rule, the future of the project of gas transportation to Asia-Pacific countries, is determined by the signed contracts and implementation of energy projects. For Russia the cooperation with Asia-Pacific countries has trade and investment value. At the same time a key source for export are energy resources of the Far East. In this region concentrated more than 14% of inventories of oil (about 4 billion tons) and 17% of natural gas (or 42 trillion

cubic meters). Degree of competitiveness of the territories of the Far East is determined by the existing projects which at the present stage already bring result. One of them - "Sakhalin-II" (Sakhalin Energy). Two main processing lines annually receive about 14,9 billion cubic meters of liquefied natural gas, 11 million tons from which it is exported to the countries of Asia - Pacific region. The project is aimed first of all at gas markets of Japan and South Korea. In 2017 "Sakhalin Energy" plans to construct the third processing line which capacity will make about 5,4 million tons/years.

The new stage of a cooperation of the "Gazprom" and "CNPC" company concerning supply of gas through Altai to China on the force of "Siberia-2" project (Western route) are begins. Many experts assume, that export size will reach 30 billion cubic meters a year. The project construction presumably will begin in 2020. Until "Gazprom" with the Chinese company came to the mutually advantageous contract, however, this project is profitable to China as a part of infrastructure is already created, and the breakeven point of gas projects of Gazprom is rather low[†].

In addition, in 2014 the "Gazprom" company signed with the "CNPC" company the contract for 30 years for delivery to China of 38 billion cubic meters a year on "The Force of Siberia" project (East route). At the beginning of March, 2017 it became known that the project considerably extended thanks to the allocated investments into 158,8 billion rubles. China is interested in Russian gas supplies, generally to three provinces of the northeast: Heilongjiang, Jilin and Liaoning which have deficiency not only in gas, but also in oil (see Figure 3).

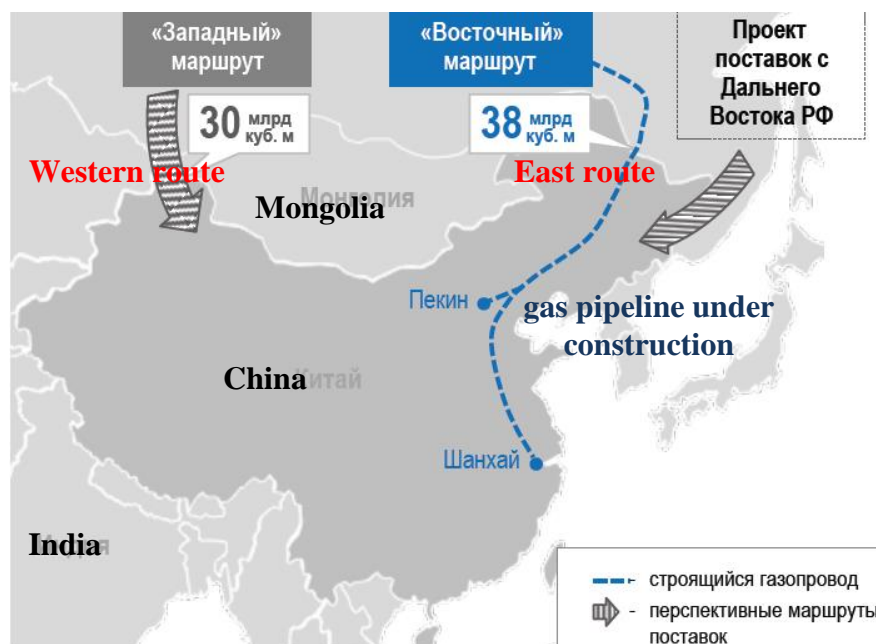


Fig. 3. Directions of supply of gas from Russia to China

Source: <http://www.gazprom.ru/f/posts/91/11594/presentation-press-conf-2017-06-08-ru.pdf>

[†] CNPC is ready to build "Force of Siberia - 2". [Online] Available: <http://www.vedomosti.ru/business/articles/2016/06/15/645346-cnpc-silu-sibiri> (November 23, 2017)

China, as a result of a big flow of import of cheap oil, became the world center of oil processing owing to what China took the second place in 2017 the USA on capacity of oil refinery. According to some information, the Russian ESPO (Eastern Siberia Pacific Ocean) was demanded in the market of the Asia - Pacific countries, however China acts as the main buyer (see the Figure 4).

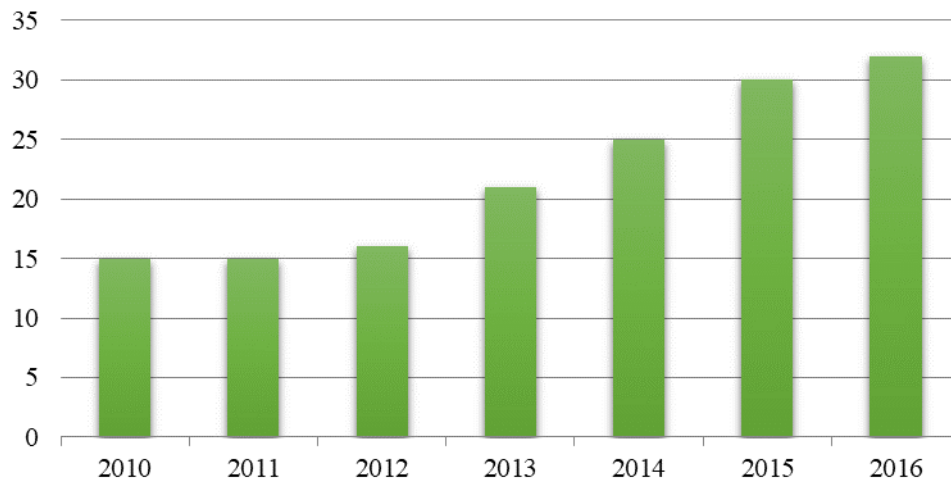


Fig. 4. Dynamics of deliveries of ESPO, one million tons
Source: Anankina and Griaznov, 2017

According to “Rosneft” company, supply only of one oil to the Asia-Pacific countries grew by the beginning of 2017 by 8,6% (about 43 million tons), not to mention gas. On March 8, 2017 the Minister of Energy of the Russian Federation A. Novak and India - Dkharmendra Pradkhan discussed joint energy cooperation in projects on the Arctic shelf of Russia and future deliveries of the Russian gas to India. In case of the growing demand for gas in the Indian market and perspective projects in Russia, interest of India purchased strategic nature[‡].

Development of the “Sakhalin” projects in the Far East will allow not only to increase twice deliveries to Asia-Pacific countries and also to win the competition in the market of LNG against the prime vendor of gas and developing in this sector - Australia. In 2016 "Sakhalin-I" and "Sakhalin II" delivered on the Asian market about 12 million tons of LNG a year, from them more than 70% - to Japan.

In April, 2017 it became known that the energy relations between Russia and Japan move to a new level, in connection with project development "Sakhalin-III". The project is planned to be started in 2022. Project implementation will allow Japan to receive gas 2,5 times cheaper than LNG in the world market. So, "Japan Pipeline Development and Operation" (JPDO) and "Japan Russian Natural Gas" (JRNG) develop the plan of the gas pipeline “Sakhalin-Hokkaido” through which gas of more than 20 billion cubic meters a year will be delivered. Length will reach 1,5 thousand km to Tokyo, the cost of such project will constitute about 5,5 or 6 billion dollars (see the Figure 5).

[‡] Russia and India agreed about work on the shelf of the Russian Federation. [Online] Available: <http://www.vestifinance.ru/articles/82291> (November 21, 2017)

According to experts of "JPDO" the construction of the gas pipeline will be profitable to both parties: the project will be in great demand, than was planned (about 25 billion cubic meters of gas instead of 20 billion cubic meters). At the same time, these assumptions rely on the fact that Japan - the largest world consumer of LNG, and it is possible that purchase of gas on a long-term stable basis, will lead to expansion of demand.

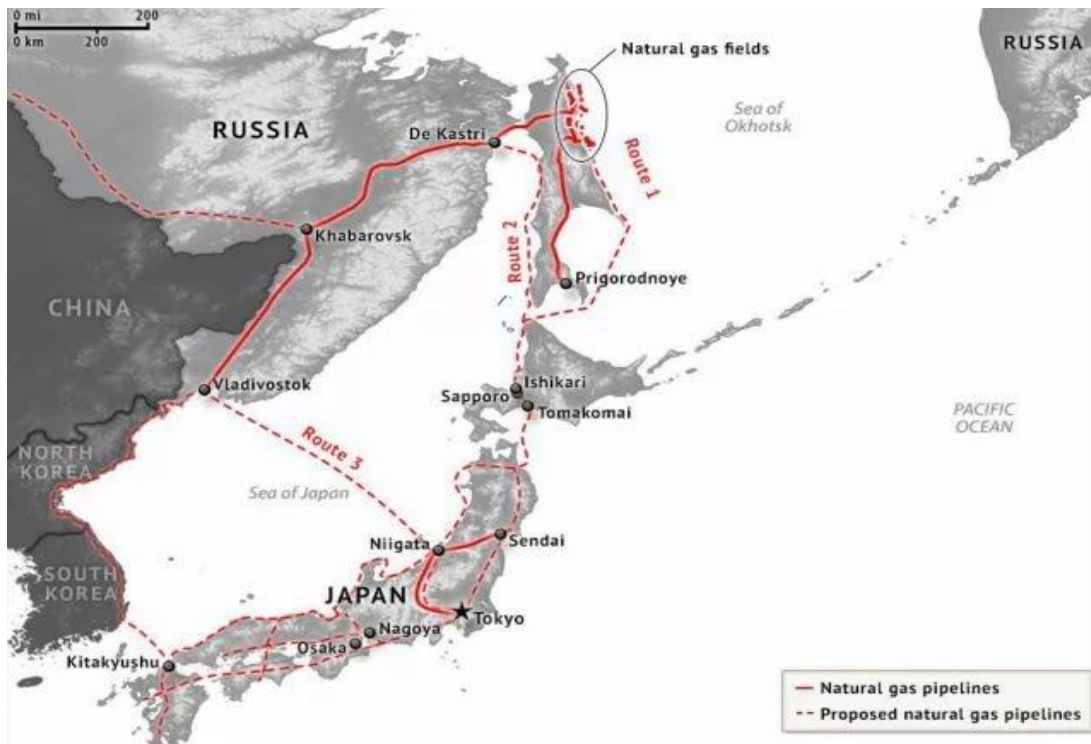


Fig. 5. Project plan of "Sakhalin-Hokkaido-Tokyo"

Source: <http://edo-tokyo.livejournal.com/5796034.html>

Profitability of the project is estimated by ROE coefficient (profitability of an equity) more than in 20%, not only own financing by consortium, but also attraction to participation of the leading foreign enterprises, investors and credit institutions is also supposed.

Fields of the project of "Gazprom" will become resource base - "Sakhalin-III" which inventories are estimated at 1,4 trillion cubic metres, also a source of raw materials the Japanese companies would like to see Eastern Siberia with inventories in 3,2 trillion cubic metres and the "Sakhalin-I" field from 500 billion cubic meters. Discussions about purchases of gas about the last two fields are conducted by the companies for many years. At present Japan buys about 80% of the Russian gas from the field of "Sakhalin-II".

By calculations of "Japan Russian Natural Gas" if transportation constitutes 25 billion gas in the form of LNG, then costs for liquefaction will be about 18 billion dollars. Therefore, the price taking into account costs for transport, for liquefaction, regasification and delivery will constitute 5 dollars / MMBtu, and the cost of pipeline gas of only 2 dollars / MMBtu. By calculations of experts, income from transportation will constitute about 1,5 billion a year, operating expenses about 500 million a year, revenue about 1 billion dollars, a net income about

670 million dollars. According to "Japan Pipeline Development and Operation", the project has high profitability, as confirm this financial performance[§].

South Korea also takes the dominating position in a number of importers in the LNG world market. Increase in demand in South Korea is explained by growth of industrial production and the low price of gas. A benefit of the gas market of South Korea - the developed internal gas transmission network connecting the LNG coastal terminals to the main points of consumption of energy resources. However, the gas market of the country completely depends on gas import. Agreements on supply of the Russian LNG to Korea were reached at the beginning of 2008. In 2011 "Gazprom" and the South Korean company - "KOGAS" signed the road map. Total length of the gas pipeline was estimated at 1,1 thousand km., from them 700 km - through North Korea. The construction cost of such gas pipeline through the territory of DPRK was originally estimated at 2,5 billion dollars.**

In 2017 it became known that the Korean state corporation "KOGAS" conducts negotiations with "Gazprom" on increase in purchases of gas. While South Korea isn't carried to large buyers of the Russian LNG, however, the deputy minister of trade, the industry and power - In Taychi said that with fall of cost of gas, the Russian LNG became the cheapest and attractive resource in South - East Asia^{††}.

The main supply of gas to Korea is performed with LNG - the "Sakhalin Energy" plant. In 2016 to Korea it was delivered by order of 1,9 million tons LNG (17% of general LNG production - the plant), however this year according to the plan Korea will increase purchasing amount approximately to 2,5 million tons, to 2020 - up to 7 million tons (considering rapid growth of demand and that fact that search of resources on the shelf to Koreas didn't yield results). Increase of a role of the Far East in providing Asia-Pacific countries with gas are provided in Table 2.

Table 2. Forecast data of gas export from Russia to Asia-Pacific countries, billion cubic meters

Countries	Years			
	2015	2020	2025	2030
China	40	78	102	165
Japan	5	7	10	12
South Korea	10	17	20	23
to other Asia-Pacific countries	3,4	8,5	10,3	10,3

Source: Pogosian, 2017

[§] Mordyushenko O., Skorlygina N. (2017). Japan calculated the road to Russia. [Online] Available: <http://www.kommersant.ru/doc/3248653> (November 26, 2017)

^{**} The Russian gas is capable to unite two Koreas. [Online] Available: <https://vz.ru/economy/2017/7/6/877593.html> (November 26, 2017)

^{††} Pogosian A. (2017). South Korea will fight for the Russian gas. [Online] Available: <https://iz.ru/612602/arsenii-pogosian/koreia-namerena-narastit-zakupku-spg-u-gazproma-do-10-mln-tonn> (November 23, 2017)

Conclusion

The competition in the world gas market (especially it is connected with development of the energy sector in the Middle East) doesn't allow to say, that Russia is the largest suppliers in the market of Asia-Pacific countries. Nevertheless, interest in the Russian energy resources in the Asian market constantly grows. China, Japan and other countries of this region are already present at an energy portfolio of the Russian gas companies. It is connected with a geographical location of Russia, with high inventories of hydrocarbons in the Far East, safety of deliveries, low policy risks, etc. In other words, the Russian market of energy carriers in this region is quite predictable that can't be told about suppliers of energy carriers from other countries.

Projects of Russia are competitive even in case of the low prices of gas, for example, the "Yamal - LNG" project. Now breakeven price of this project makes 5 – 6 dollars/one million of the Britain-thermal units (BTU) whereas at the beginning of 2017 the prices of LNG in the Asia-Pacific countries constituted 7,5 dollars/one million of BTU. Russia is capable to bring about 10 more projects which have chances of implementation till 2030 to the market. First of all, it concerns projects of the Far East LNG and the "Vladivostok - LNG" project. Thus, the Russian-Asian relations in the energy sphere become stronger, and it is possible that in the future Russia will be able to take the place of the large supplier in the market of the Asia-Pacific countries.

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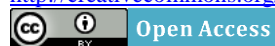
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CORPORATE LENDING IN THE DEVELOPING MARKET OF BANKING SERVICES

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Abstract. Despite their importance for economic development, small and medium-sized enterprises encounter many difficulties in searching for capital due to an insufficient amount of information forwarded to banks and its asymmetry. However, the better the economic condition of an enterprise and the more information about it available, the easier it is to gain extra bank funds. Among the factors determining credit availability the ones that characterize enterprises, as well as the features characterizing the banking sector, were analysed. A model approach to enterprise cooperation with banks was presented. On the basis of the logit model results and on the panel data the factors significant for credit availability were presented, both the ones lying on the side of an enterprise as well as the banking environment. The aim of the research was the determine the differences in the access to bank loans in terms of the character of bank cooperation, the size of the entity and other features. The results of the empirical analysis showed that in Poland, similarly to other European countries, small and medium-sized enterprises have greater difficulties in gaining a credit than big companies. Moreover, a significant dependence of bank credit availability from the size of the company, liquidity, profitability and the situation in the banking sector was demonstrated.

Keywords: credit availability; determinants of corporate lending; banking sector; SMEs;

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JEL Classifications: G21, G31

1. Introduction

The development of an enterprise depends on its possibility of capital raising. Many enterprises in Poland use bank loans as the main source of external capital. Bank credit availability varies according to many factors related to enterprises and the operating banks. One of the features which may be described as differentiating the terms of credit gaining is the size of the enterprise. Small and medium-sized enterprises, despite their importance for economic development, encounter many difficulties in searching for capital due to an insufficient amount of information forwarded to banks and its asymmetry. However, the better the economic condition of an enterprise and the more information about an enterprise available, the easier it is to gain extra bank funds.

The aim of the research was to determine the differences in the access to bank loans in terms of the character of bank cooperation, the size of the entity and other features. Among the factors determining credit availability the ones that characterize enterprises (e.g. company's age, its financial results, the length of bank relation, the number of operating banks), as well as the features characterizing the banking sector (i.e. concentration ratio of the banking sector, interest margin indicator) were analysed.

A model approach to enterprise cooperation with banks is presented. On the basis of the logit model results and on the panel data, the factors significant for credit availability are presented, both the ones lying on the side of an enterprise as well as the banking environment. The research was carried out considering small and medium-sized enterprises (SMEs), as well as young and mature companies. Additionally, on the cross-sectional data, there was an analysis of the factors influencing the denial of credit by a leading bank and the factors influencing the bank inclination to use the services of many banks.

2. The literature review

The bank's decision on crediting an enterprise is based on the estimation of many factors. Petersen and Rajan (1994) enumerate:

- the debtor's inclination to the repayment of the debt determined on the basis of previous bank experiences (entity's credit history),
- the debtor's possibility of repayment of the debt (determined on the entity's economic situation),
- macro-economic conditioning (and the local situation) influencing the probability of repayment of the debt,
- possible collateral (property which can be allocated to repayment of the debt in case of failure),
- equity of the enterprise.

A part of the information essential for the decision on crediting an enterprise can be gained by a bank through keeping a long-term, closed cooperation (Petersen & Rajan 1994). The cooperation of an enterprise and a bank takes various forms depending on the information on the basis of which the bank makes a decision on its crediting. It can be a transactional (transaction-oriented banking) or relational cooperation (relationship banking).

Relations between the debtor and the financial institution differ depending on the size of the company. Crediting small enterprises is different than crediting the big ones in respect of the cost of the bank credit and the costs of gaining the information about the debtor. Insufficient amount of information given to banks and its asymmetry may result in limited access of SMEs to capital.

A determinant of credit availability for enterprises is also the length of an enterprise and bank's cooperation, especially if it goes to the cooperation of relational character. Petersen and Rajan (1994) showed that the long-

term relationship strengthens the bank's inclination to financing the familiar enterprises' projects. The cooperation does not have to relate to crediting. A lot of information about the condition of the enterprise is supplied through the observation of changes in the current (trading volume, quality, and number of contractors, etc.) or deposit accounts.

A long-term cooperation is beneficial to the price of bank services. Boot and Thakor (2000) claimed that in the sample of small enterprises studied by them, the credit interest rate went down with the length of the entity's cooperation with the bank. The requirements related to collateral are also getting lower. They also observed that decreasing the price of credit may happen together with the length of cooperation, regardless of the amount (scope) of information gathered by the bank. Credit interest rate is lowered for entities which proved that they were able to complete the project (the bank does not broaden its knowledge with new elements, but analyses those which were given by the enterprise).

The level of competition in the banking sector may also influence the relation between the length of an enterprise's cooperation with a bank and an interest rate. Sharpe (1990), as well as Petersen and Rajan (1995), claimed that the interest rate may increase in such circumstances together with the length of the entity's cooperation with the bank. According to this approach, banks compensate previous riskier financing of unknown companies.

The banks' interest in financing the enterprises not checked before is a result of the necessity of soliciting customers and enhancing the credit portfolio. In the uncompetitive market, the banks have a tendency to smooth out the rate of return from crediting one entity. In the initial period of its existence, they provide relatively cheap capital, the cost of which increases in time. It results from the fact that banks wrongly price the credits given to young, unknown entities or they evaluate the mature, well-established entities in a highly restrictive way. In addition, banks in the uncompetitive market count on the future benefits from crediting a given company and that is why they decide to provide a relatively cheaper capital at the beginning of its functioning.

Banks behave differently towards mature entities in the competitive market – they charge a lower fee for a credit. It also explains why mature enterprises in an uncompetitive banking market finance investments basing rather on internal sources of finance than banking, and how banks adjust their corporate lending portfolio (Cahn, Christophe et al., 2017; Belás et al., 2017; Rajnoha et al., 2017; Davydenko et al., 2017). That is why the determinant of widely-understood credit availability for enterprises is the level of competition in the market of banking services.

Young enterprises which obtain bank loans are deeper in debt (the ratio of credit to total assets) in the uncompetitive market than in the competitive one. Mature companies are in a reverse situation. Boot and Thakor (2000), analysing the influence of growing competition in the banking sector, compared two methods of banks and enterprises cooperation (transactional and relational). They came to a conclusion that, regardless of the method of cooperating with enterprises, banks' profits decrease together with the increase of competition among them. However, it happens asymmetrically. Relational cooperation (in view of a unique character of information the banks administrate) allows protecting bank's profits from the dangers of the growing competition in the sector. Possible reductions of profit refer to the benefits reached from transactional crediting. Another aspect was discussed by Pietrzak et al. (2017), the quality of entrepreneurial environment becomes more and more important, and it may be an obstacle for growth for peripheral countries and regions.

Together with the increase of competition in the banking sector, the banks' interest in crediting the enterprises which require a relational – individual (enabling to benefit from having unique data about the enterprise) approach increases. On the other hand, the corporate sustainability performance is reflected in bank loan prices, as

Hauptmann (2017) discuss in her paper. By taking the sustainability performance of the lending bank into account, Hauptmann shows that borrowers with strong sustainability performance pay lower loan spreads than borrowers with weak sustainability performance.

The processes of mergers and acquisitions in the banking sector also influence credit availability for enterprises. The analysis of the influence of consolidation processes in the banking sector on credit availability for small and medium-sized enterprises showed that if the processes related to big banks, financing of smaller enterprises was highly limited. However, if smaller banks merge, the effect is the reverse: credit availability for SMEs increases. It means that big banks willingly get rid of small debtors who they cooperated with basing on the relational model and decide to start cooperation of transactional type (Keeton, 1996; Peek & Rosengreen, 1998; Strahan & Weston, 1998).

Another feature differentiating credit availability for enterprises is the number of operating banks (multiple banking). Berger and Udell (1995), and also Petersen and Rajan (1994), analysing small enterprises, came to the conclusion that enterprises rarely cooperate with only one bank. The number of banks servicing an entity is a function of enterprise's size. In those studies, the number of banks servicing huge entities was from 1 to 6, whereas in the sample of medium-sized enterprises the span was significantly bigger: from 1 to 21, wherein the average number of operating banks was 5.

The results of studies by Detragiache et al. (2000) referring to the relation with many banks (multiple banking) show that duplication of monitoring and scoring assessment generate costs in all servicing banks. On the other hand, not duplicating the entity's economic situation assessment and basing only on the results of another bank's analysis may result in losses. Many factors indicate that for an enterprise maintaining a relationship with many banks is expensive, mainly because of transactional costs. Also, Cole (1998) came to similar conclusions stating that a big number of banks servicing an enterprise, does not make the access to capital easier for it.

Positive dependence between the size of an enterprise and financing with a bank credit was confirmed by Demiroglu, James, and Kizilaslan (2012), as well as Berrospide, Meisenzahl, and Sullivan (2012). Whereas, Ghosh (2010) and Jiménez and others (2010; 2012) underlined a low use of a bank credit by big companies. Big enterprises are attributed with a lower risk rate, since they are more diversified, better known to external entities, and they face the problem of information asymmetry to a smaller extent.

Andrés Alonso and others (2005) estimated an econometric model in order to stipulate the bank credit share in the financing assets of Spanish enterprises with the use of a generalized method of moments. A positive dependence was observed between the size of an enterprise and the use of a bank credit. Big enterprises have greater bargaining power which they use to establish and maintain relations with a bank. As a result, big entities, which could resign from financing in the banking market in favour of debt issue, use bank credits. On the grounds of conducted analysis, Dewaelheyns and Van Hulle (2007) stated that big enterprises with a high share of tangible fixed assets use bank credit to a greater extent. Another model was developed by Brkic, Hodzic and Dzanic (2017) as a support tool for evaluation of corporate client credit risk in a commercial banking environment.

Ghosh (2010) proved that in small enterprises tighter monetary policy results in limiting short-term indebtedness. A fixed effects estimator was used in the study while controlling the property of the enterprise. Less indebted enterprises lower their indebtedness in general, whereas profitable companies increase their level of indebtedness. On the grounds of achieved results, it was stated that the tightening of monetary policy is accompanied by an increase in total indebtedness, which is contrary to the conclusions drawn from the operations of an interest rate channel. While analysing indebtedness components, it was indicated that short-term indebtedness against the bank increases, whereas short-term indebtedness in general decreases. An increase in interest rates translates into a

deterioration of the availability of all financing sources of a liability character. Older, highly indebted enterprises, characterized by low profit, increase bank credits, in particular, short-term ones, as a reaction to a tighter monetary policy.

Cole (2008) proved that a lack of demand for credit was declared by smaller companies. Cole (2010) analysed the impact of the size of an enterprise (logarithm of sales) on financing with a bank credit. It was stated that smaller entities with higher profitability and liquidity, having fewer fixed assets, do not use credits. Whereas, enterprises financing activity with a bank credit are bigger, younger, less profitable and have lower liquidity. The relation between a bank credit and assets in such enterprises is positively related to liquidity.

On the grounds of a study, Cole and Dietrich (2013) stated that smaller and older enterprises report demand for credit less frequently. Among companies in need of credit, but not applying for it for fear of rejection of a credit application, young, slowly developing entities rarely operating in the form of a corporation or having an external auditor, as well as an experienced management, prevails. A majority of them have their registered offices in big cities and in countries with lower inflation and higher GDP increase. Among enterprises in need of credit, 40% do not apply for it, since they believe the application will be rejected (33% from developed countries and 44% from developing countries). In the studied sample, almost a half of the companies applying for credit did not obtain it, and the percentage of rejections was higher in developed countries (54%) than in developing countries (48%).

Jiménez et al. (2009) proved that the size of an enterprise and its age has a positive impact on the number of obtained credits. Enterprises in a better financial situation benefit from external financing to a greater extent. Jiménez and others (2010) studied the availability of bank credit in Spain on the grounds of credit margins. The hypothesis that credit supply is limited in a situation of lower GDP increase and higher short-term interest rates was verified. It had been expected that enterprises with a lower capital have a higher creditworthiness. It was stated that lower bank capital impacts credit supply in various ways. Furthermore, banks' capital and liquidity rates constituting a core measure of their balance sheets were also taken into consideration. The Logit model was estimated, in which a dependent variable was defined as a binary variant with value 1 if a credit application of an enterprise i was considered positively in a period t by a bank b and credit was granted. From among the characteristics of enterprises, their size measured with total assets value was analysed. It was stated that banks with lower capital or liquidity grant fewer credits in a period of the lowest GDP increase or higher short-term interest rates. It was proven that weaker companies that need credit and companies moderately operating in the market and related with banks with low capital or small liquidity have smaller chances to obtain credit under conditions of the tighter monetary policy.

Love and Peria (2013) assessed the meaning of selected variables for enterprises' access to bank credit with the use of a linear probability model. Data on enterprises from the World Bank Enterprise Surveys' base and the information concerning bank competition in various countries were used. A dependent variable was defined as a binary variable assuming value 1 if the enterprise uses a bank credit, a credit line or an overdraft facility. The model included competition in the banking market, characteristics of a country, and features of an enterprise, including its size measured with the number of full-time employees.

The study was aimed at verifying the so-called market power hypothesis. In compliance with this hypothesis, competition in the banking system reduces the costs of financing and increases the availability of credit. Whereas, in compliance with an alternative hypothesis (information hypothesis), in the case of information asymmetry and agency issue banking competition might reduce access to financing by preventing banks from benefiting from investment in establishing relations with prospects.

On the grounds of the obtained results, it was proven that low competitiveness of banks (high level of Lerner's index) is accompanied by limited access of enterprises to financing. In countries with a high level of financial development and better access to information, limitations in financing are smaller when competition between banks is weak. Enterprises and production companies that are bigger and that operate for a longer period of time have easier access to banking financing. Also, exporters have better access to credits, and for enterprises with foreign owners, it is more difficult to obtain credit, which is probably related to the possibility to obtain funds from related companies and the lack of need to apply for funds on the local market. Furthermore, it was observed that the impact of banking competition and concentration depends on the economic environment. In some countries, the adverse impact of weak competition between banks is mitigated by, among other things, better availability of information on credit or the general level of financial development. In other countries, this impact can be weakened by a high share of government in the ownership of banks.

Brown et al. (2012) stated that European enterprises are similar with regard to size. In Eastern Europe, there is a bigger percentage of state or privatized enterprises, and companies are less frequently subjected to audit than in Western Europe. In Eastern Europe companies perceive the market as less competitive but more ineffective. They conduct export activity more frequently than enterprises in Western Europe. While studying the demand for bank credit and its supply, authors also included such features of countries as the level of protection for creditors and macroeconomic conditions, among others, inflation.

After estimating the probit model for the purposes of declaring the need for bank credit Brown and others (2012) concluded that in Eastern Europe small, state, and foreign enterprises at the disposal of internal funds less frequently need bank credit. Whereas, the need for credit is higher in older enterprises and those conducting the export activity. State and foreign companies less frequently report the need for credit. Whereas, exporters probably benefit from credit more frequently than non-exporters. The determinants of the need for bank credit are similar in the studied regions. Enterprises with alternative financing sources, that is, state and foreign entities, as well as entities with high internal funds, probably use bank credit less frequently. Also, small companies report the need for credit less frequently. However, the impact of the size of an enterprise is weaker than in Western Europe. Small Eastern European companies and state companies from Western Europe less frequently apply for credit, despite the fact that they need it more frequently. The reasons for not applying for credit most frequently comprise the requirement to have collateral, too high interest, as well as complex and troublesome credit procedures.

In Eastern Europe, the probability of not granting credit is higher than in the case of small enterprises, enterprises which have been conducting business for a short period of time, and private entities. Exporters have more chance that their credit application will be positively considered. The probability of not granting credit to state or foreign companies in Western Europe is lower than in Eastern Europe. Foreign ownership of a bank sector discourages potential borrowers. The obtained results confirm the hypothesis that foreign banks more willingly lend to big companies with reliable financial statements. Nevertheless, it has not been proven that foreign ownership of banks results in an increase in the percentage of rejected credit applications, or tightening conditions of granting credit. The higher percentage of enterprises discouraged from applying for credit in Eastern Europe might result from the presence of foreign banks, and not from differences in the macroeconomic environment or creditor protection.

Jiménez and others (2012) proved that bank crises are characterized by a permanently limited use of credit and low economic growth. The deterioration of banks' balance sheets impacts the economy mainly via limitation of credit supply. It was researched whether the reason for limiting credit is attributable to supply (a balance sheet channel) or demand (a credit channel). The net value of a bank and enterprises changes along with the business cycle, yet the net value and strength of a bank's balance sheet play a significant role during financial crisis (Gentler & Kiyotaki, 2013). In the study, the data for the years 2002–2010 were used, including information on

all credits granted by Spanish banks. The hypothesis was verified of whether variables describing the conditions of a bank's and an enterprises' balance sheet have a bigger impact on the positive consideration of a credit application in a period of crisis than in a period of a good economic situation. For this purpose, they estimated a linear probability model. They included a share of a bank's non-performing loans and the Herfindahl–Hirschman index of a bank's credit portfolio in compliance with industry sectors, as well as the length of relations between the bank and an enterprise. Furthermore, they estimated models extended with control variables referring to the macroeconomic environment: annual revision of real GDP, annual revision of interest of three-month credits in the interbank market, CPI inflation rate. The crisis resulted in governments and central banks providing commercial banks with funds of significant value (government protectionism, recapitalization, support for liquidity and various activities of a central bank as a creditor of the last instance) in order to help in re-establishing liquidity. Despite these activities, banks' problems caused a decrease in credit supply in a period of a crisis. On the grounds of the obtained results, it was stated that banks' balance sheets have a significant meaning not only during a crisis, and that they do not influence granting credit during a period of economic recovery. It was proven that enterprises with a higher relation of equity capital to assets in general, and with a better credit history, have bigger chances to obtain credit. The impact of an enterprise's profitability on financing with bank credit could not have been unilaterally stipulated. Additionally, on the grounds of market data, a logit model was estimated in which a dependent variable was defined as a binary variable indicating whether an enterprise obtained credit. A method of least squares was used to research the number of credits obtained by one enterprise. From among dependent variables, the features of enterprises and banks, as well as variables reflecting macroeconomic conditions were used. More profitable enterprises (with higher ROA), with bigger fixed assets or cash, take fewer credits and depend on internal financing more.

In compliance with the theory of the hierarchy of financing sources, enterprises prefer to benefit from internal rather than external financing, since high profits enable financing investments with obtained revenues. More profitable entities have higher creditworthiness and low profitability can limit access to bank credit. Therefore, it is justified to expect a positive impact of profitability on the use of bank credit. Nevertheless, enterprises can increase indebtedness in banks in order to cover cash shortages resulting from low profitability. Thus, one should expect an adverse dependency between profitability and bank credit. Empirical studies do not explicitly stipulate the character of dependency between profitability and financing with bank credit; empirical confirmation can be found for adverse as often as for positive dependency.

3. Modelling of credit availability for enterprises

Initially, the following research problems were formed:

- Does the SMEs sector have a smaller access to loans and worse credit conditions than big enterprises?
- What are the main reasons for rejecting loan applications by banks?

In the quantitative study carried out with the use of binary models, the data coming from the survey of enterprises and the data from banking statistics were used.

First, the results of the panel study were presented. Its aim was to extract significant factors influencing the rejection of loan applications both on the side of the companies applying for the loan and the crediting banks.

Next, the results of two cross-sectional studies were presented (carried out in the year 2013): the first dealt with the reasons for the rejection of the loan application by the leading bank, the second dealt with the relationship of the companies with many banks. Cross-sectional studies were repeated in 2015.

4. Panel study results

In the panel study, the probabilistic model of logit type was used. The study allowed identifying the factors significantly influencing the denial of credit, both on the side of an enterprise (through studying the variables determining the feature of enterprises) and the banks (through testing the importance of the variables characterizing the situation in the banking sector).

The probabilistic models are used when the dependent variable has a quantitative character. The models of logit type are especially used in such a case when the dependent variable is dichotomous, i.e. it takes two values: 1 or 0. In the following study for the dependent variable was taken a dichotomous variable specifying an incident involving a denial of credit for an i enterprise by a bank in a t period of time. For every i enterprise in the t period of time in the analyzed panel of data, the dependent variable (RE) takes the value of 1, when the enterprise experienced a denial of a credit in the period of 12 months with the probability p_i . However, the dependent variable takes the value of 0 in the case of an opposite event – the enterprise did not experience a denial of a credit in the period of 12 months with the probability $1 - p_i$. The analytical form of the estimated logit model is presented by equation 1:

$$\ln \left(\frac{p(RE_{it} = 1)}{1 - p(RE_{it} = 1)} \right) = (fvariables)_{it} * \gamma_1 + (bvariables)_{it} * \gamma_2 + \alpha_i + \varepsilon_{it} \quad (1)$$

where:

α_i – individual random effects,

ε_{it} – pure random indicator,

$fvariables$ – variables characterizing the enterprise sector,

$bvariables$ – variables characterizing the banking sector (Cf. Degryse et al. 2005).

The data used in the panel study are individual data of enterprises from a nationwide survey and the data from the banking statistics, including the years 2005–2013. Additionally, in order to update studies' results, data for 2014 – 2015 were used. In the estimated model for a dependent variable was taken a binary variable (RE), defining the relationship with banks:

$RE = 1$, when the enterprise experienced a denial of a credit for the period of 12 months with the probability p_i ,

$RE = 0$ in an opposite case.

For dependent variables ($fvariables$) were taken:

- net profitability ratio estimated as a quotient of the net result of the i profit of the enterprise (x_1),
- the indicator characterizing the financial situation of the company estimated as the funds to total assets i of the enterprise (x_2),
- the estimated size of the company, as a logarithm of the size of assets i of the enterprise (x_3),
- the age of the enterprise estimated as a logarithm of age i of the enterprise (x_4),
- the size of the financial leverage estimated as a quotient of the sum of long-term loans to short-term ones of an enterprise to the assets in total assets i of the enterprises (x_5),
- binary variables defining the form of ownership i of the enterprise:
 $b1 = 1$, when the enterprise constitutes public ownership,
 $b1 = 0$ in an opposite case,

b2 = 1, when the enterprise constitutes Polish private ownership,
 b1 = 0 in an opposite case,
 b3 = 1, when the enterprise constitutes foreign ownership,
 b1 = 0 in an opposite case,

The variables from the banking statistics (bvariables) as the measurements characterizing the situation in the banking sector:

- a return from the banking sector assets in the t period of time (x'_1)^{*},
- the indicator of bad loans in the t period of time (x'_2)[†],
- the concentration of the banking sector assets in the t period of time (x'_3)[‡],
- the indicator of the interest margin of the banking sector in the t period of time (x'_4)[§]

Table 1. The estimation of the panel model parameters divided into SMEs and big enterprises

	SMEs				Big enterprises			
	Regression1		Regression 2		Regression 1		Regression 2	
	indicator	p>|z|	indicator	p>|z|	indicator	p>|z|	indicator	p>|z|
x3	-0,052	0,721	-0,052	0,721	-0,372	0,003	-0,372	0,003
x4	-0,016	0,854	-0,016	0,854	-0,046	0,832	-0,046	0,832
x1	-0,016*	0,045	-0,016*	0,045	-0,018**	0,017	-0,018**	0,017
x2	-0,073***	0,007	-0,073***	0,007	-0,132***	0,001	-0,122***	0,001
x'1	-0,040	0,301	-	-	0,072***	0,005	-	-
x'3	-0,036	0,453	-	-	0,087***	0,003	-	-
x'4	-	-	0,002**	0,028	-	-	0,081***	0,004
x'2	-	-	-0,006	0,398	-	-	0,001***	0,002
x5	-0,003	0,299	-0,003	0,299	-0,002	0,798	-0,002	0,798
b1	-21,39	0,826	-21,4	0,899	0,898***	0,012	0,898***	0,004
b3	-0,896	0,138	-0,896	0,169	-0,482	0,163	-0,482	0,163
Fixed	24,69	0,452	8,37	0,458	-88,22***	0,002	-16,72***	0,001
No. of obs.	421		421		1324		1324	
No. of groups	321		321		604		604	

Source: own construction

Note: *** a significant variable, with the level of significance 1%,

** a significant variable, with the level of significance 5%,

* a significant variable, with the level of significance 10%.

Table 2. The estimation of the panel model parameters divided into young and mature enterprises

	Young enterprises				Mature enterprises			
	Regression1		Regression 2		Regression 1		Regression 2	
	indicator	p>|z|	Indicator	p>|z|	indicator	p>|z|	indicator	p>|z|
x3	-0,021	0,798	-0,021	0,798	-0,221**	0,009	-0,237	0,009**

* Estimated as the net result for the banking sector assets in a given year.

† Estimated as the share of assets of non-performing loans.

‡ x'3 is defined as a sum of squared shares of certain commercial banks in the market in assets in a given year.

§ The net interest margin ratio is estimated as a quotient of net interest profit and an average state of the banking sector assets in a given year.

x4	-0,172	0,488	-0,172	0,488	-0,098	0,540	-0,007	0,873
x1	- 0,052** *	0,003	-0,052**	0,003	-0,018	0,050	-0,003	0,004
x2	- 0,094** *	0,002	-0,094**	0,002	-0,165	0,001	-0,140	0,001
x'1	0,031	0,373	-	-	0,051**	0,053	-	-
x'3	0,046	0,301	-	-	0,072**	0,023	-	-
x'4	-	-	0,007	0,275	-	-	0,048**	0,035
x'2	-	-	0,003**	0,031	-	-	0,003***	0,002
x5	0,003	0,784	0,003	0,784	-0,04	0,314	-0,04	0,314
b1	-0,821	0,248	-0,821	0,248	0,901	0,037	0,901	0,037
b3	0,711**	0,039	-0,711**	0,039	-0,289	0,517	-0,289	0,517
Fixed	-39,23	0,217	-13,79	0,217	-48,16	0,018	-19,37**	0,027
No. of obs.	520		520		970		970	
No. of groups	302		302		485		485	

Source: own construction

Note: *** a significant variable, with the level of significance 1%,

** a significant variable, with the level of significance 5%,

* a significant variable, with the level of significance 10%.

The results of the estimated panel model of the logit type on the basis of equation 1 showed that in the case of big enterprises the probability of the denial of a credit decreases due the following factors specifying the situation of an enterprise applying for a loan (fvariables): together with the increase of the enterprise (x3), the improvement of profitability (x1) and the improvement of liquidity (x2). Moreover, the probability of the denial of a loan by a bank is greater for a national enterprise than a Polish private enterprise.

The results of the study referring to the situation in the banking sector (bvariables) showed that the probability of the denial of a loan by a bank increases together with the decrease of competition in the banking sector (measured both with a concentration indicator x'3 (in regression 1), and also the interest margin indicator x'4 (in regression 2)). Additionally, the RE variable was also influenced by the improvement of profitability in the banking sector measured with a profitability indicator x'1 (in regression 1) and the increase of assets of non-performing loans x'2 (in regression 2) .

The variables specifying the age of the enterprise (x4) and the level of debt (x5) turned out to be irrelevant to the denial of a loan for big enterprises.

The results of the estimated model showed that for the enterprises from the group of SMEs the probability of the denial of a loan decreases together with the improvement of their profitability and liquidity . Other estimated variables turned out to be irrelevant for the denial of a loan in this group. The results of the panel analysis for mature enterprises turned out to be similar to the results for big enterprises. Also, the results for young enterprises are similar to the results for enterprises from the group of SMEs.

In the group of mature enterprises, as in the group of big enterprises, the denial of a loan is mainly conditioned by the size of an enterprise (x3), poor profitability (x1) and poor financial situation (x2).

The results of the panel study for Polish enterprises are consistent with the literature adequate for this research area. Karceski et al. (2000) and Degryse et al. (2005) on the basis of their studies proved that apart from the size

of the company, an important factor influencing the relationship with banks is profitability. The results of their studies proved that small enterprises have less stable relationships with banks than the big ones as well as the decrease of a company's profitability increases the probability of the denial of a loan by a bank.

The results of the panel analysis also showed that an essential factor influencing the relationship between companies and banks (bank lending relationships) is the situation in the banking sector. The results revealed are consistent with the literature dealing with the phenomenon in the mature economies. Petersen and Rajan (1995) and Boot and Thakor (2000) proved that a better situation in the banking sector and smaller competence among banks influenced the increase of probability of the denial of a credit for an enterprise. An important factor influencing the denial of a credit is also the share of assets of non-performing loans (Cf. Degryse et al., 2005).

5. Cross-sectional study results

In order to state which factors determine the denial of a credit for an enterprise by a leading bank, a cross-sectional study was carried out making use of the survey. For the dependent variable, a binary variable (REJ) was taken, which has a value of 1, when the enterprise experienced a denial of a credit by a leading bank in the period of 12 months with the probability p_i . The dependent variable takes the value of 0, in the case of an opposite event: the enterprise did not experience a denial of a credit in the period of 12 months with the probability $1 - p_i$. The analytical form of the estimated logit model is presented by equation 2.

$$\ln \left(\frac{p(REJ_i = 1)}{1 - p(REJ_i = 1)} \right) = (fvariables)_i * \gamma_1 + \varepsilon_i \quad (2)$$

where:

ε_{it} – pure random indicator,

fvariables – variables characterizing the enterprise sector**.

The results of the panel analysis showed that the probability of the denial of a credit for an enterprise by a leading bank within the period of 12 months decreases together with the increase of the enterprise (x_3), the improvement of profitability (x_1) and the improvement of the financial situation (x_2). The probability of the denial of a credit for a national enterprise by a leading bank is greater than for a Polish private enterprise^{††}.

The dependent variables of the financial leverage (x_5) and the age of the company (x_4) turned out to be irrelevant for the event involving the denial of a credit by a leading bank. The results of the estimation of the cross-sectional model are presented in table 3.

Table 3. The estimation of the cross-sectional logit model (the denial of loans)

	indicator	p>|z|
x3	-0,198*	0,079
x4	-0,112	0,594
x1	-0,041**	0,033
x2	-0,112**	0,028
x5	-0,005	0,482

** In the model, for the dependent variables were taken such variables of enterprises as in the panel model.

†† The positive value of the estimated factor b1.

b1	1,25**	0,025
b3	0,013	0,897
fixed	0,132	0,943
No. of obs.	470	
R²	0,1284	

Source: own construction

Note: *** a significant variable, with the level of significance 1%,

** a significant variable, with the level of significance 5%,

* a significant variable, with the level of significance 10%.

The results of the cross-sectional study involving the denial of a credit for an enterprise by a leading bank confirmed previous conclusions. On the basis of the results of the panel study, it can be stated that the main reasons for a denial are: the poor financial situation of a company (lack of liquidity) and low profitability.

In order to state the significance of the variables determining the crediting of an enterprise in a few banks, a cross-sectional study of the logit type was carried out. For the dependent variable a binary variable (WZ) was taken, which has the value of 1, when an event meaning success took place: an enterprise uses the services of more than one bank with the probability p_i , and it takes the value of 0 when an opposite event took place: an enterprise does not use the services of more than one bank with the probability $1 - p_i$.

The analytical form of the estimated logit model is presented by equation 3:

$$\ln \left(\frac{p(WZ_i = 1)}{1 - p(WZ_i = 1)} \right) = (fvariables)_i * \gamma_1 + \varepsilon_i \quad (3)$$

where:

ε_{it} – pure random indicator,

fvariables – variables characterizing the enterprise sector^{††}.

The results of the analysis showed that the probability of the event involving the fact that an enterprise uses the services of more than one bank increases together with the increase of the enterprise (x_3) and the increase of the enterprise's debt (x_5). Also, the deterioration of the company's financial situation significantly influences the use of the services of many banks (the negative value of the factor with the variable x_2).

The probability that a foreign enterprise uses the services of more than one bank is lower in case of a Polish private enterprise, as evidenced by the negative value of the estimated factor with the variable (b3). The result may show that foreign enterprises more frequently build relationships with one bank than Polish private enterprises.

Table 4. The estimation of the cross-sectional logit model (multiple banking)

	indicator	p> z
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^{††} In the model, for the dependent variables were taken such variables of enterprises as in the study of the denial of a credit by a leading bank.

x3	0,402***	0,001
x4	0,112	0,304
x1	-0,001	0,198
x2	-0,038***	0,011
x5	0,019***	0,002
b1	-0,423	0,174
b3	-1,231***	0,001
fixed	-4,18***	0,005
No. of obs.	460	
R²	0,1335	

Source: own construction

Note: *** a significant variable, with the level of significance 1%,

** a significant variable, with the level of significance 5%,

* a significant variable, with the level of significance 10%.

The variables defining an enterprise's profitability (x_1) and the age of an enterprise (x_4) turned out to be irrelevant for the use of the services of more than one bank. The results of the estimation of the cross-sectional model are presented in table 4.

The results of the cross-sectional study confirm the conclusions presented in the previous part of the article involving the factors influencing the use of a bigger number of banks by a company. In this case, the size of the entity is one of the more important strengths of the company which took loans in more than one bank.

Conclusions and discussions

The above-presented review of the factors influencing the availability of bank loans for entrepreneurs enables to formulate the following conclusions:

First of all, it can be stated that in Poland, similarly to other European countries, it is more difficult for medium-sized or small enterprises to obtain a credit than the big ones. At the same time, it ought to be stressed that in recent years in both groups of enterprises the number of rejected loan applications had diminished.

The main reasons for denying a credit for the enterprises from both the groups are lack of proper liquidity and low profitability. The result was confirmed by the quantitative studies which were carried out. From the panel and cross-sectional studies, it can be concluded that together with the deterioration of a company's financial situation and the decrease of profitability, the possibility of a credit being denied by both the leading bank as well as any other has increased.

The banks' attitude towards the enterprises having financial problems during the period of their cooperation has served to improve the company's situation; at the same time, banks have protected their business. As far as big companies are concerned, the banks have decided to continue crediting provided that the enterprises have supply additional collateral or information about the enterprise in order to better monitor its situation. Relative to small and medium-sized enterprises, banks conditioned further crediting upon providing additional information about the company in order to improve the process of monitoring or they decided to increase the previous amount of credit in order to prevent financial problems.

For bank lending relationship the situation in the banking sector is essential. The results of the panel analysis proved that, according to the literature concerning this research area, a better situation in the banking sector and smaller competence between banks (involving greater concentration of assets and a greater interest margin indicator) influenced the increase of the probability that the crediting of a company would be denied.

The results of the analysis of multiple relationships proved that bigger entities cooperate with a greater number of banks more frequently than small and medium-sized enterprises. The hypothesis was also confirmed by the results of the logit study, which showed that the probability of an enterprise using the services of more than one bank increases together with the growth of the enterprise and its debt.

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COMPETITIVENESS AND SUSTAINABLE GROWTH ANALYSIS OF THE EU COUNTRIES WITH THE USE OF GLOBAL INDEXES' METHODOLOGY*

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Abstract. The issue of countries' competitiveness and sustainable economic growth is constantly at the centre of interest and represents the frequent object of research in economic theory as well as economic practice. The multi-criterial approach and the assessment methodologies relating to the global competitiveness have been dynamically adjusted over the recent years to reflect the current globalization trends in the world economy. The main objective of this study is to analyse the objectivity and resulting values' deviations of the Global competitiveness Index (GCI) and World Competitiveness Index (WCI) composite indexes that are currently considered to be the world's most respected and to identify the impact of key factors that affect the countries' competitive positions with a focus on Slovakia. The research study is realized within the group of EU (24) countries for the period 2006 – 2016. The partial objective is to summarize the main starting points of the World Economic Forum (WEF) and Institute for Management Development (IMD) composing these indices, to identify their common features and different approaches that create differences in the results achieved. Then we analyzed the differences between the resulting rankings and the resulting scores of the GCI and WCI rated countries. In the next part, we focused on analyzing the position of Slovakia using the correlation and multiple regression analysis and identifying the interrelationships between individual pillars and the GCI score in order to determine the impact of key factors that influence the competitive position and sustainable growth of Slovakia and improve or worsen its position. Our results highlighted the economic and statistical context of GCI Slovakia development and the impact of the following key pillars and key factors: pillar P1 (P1: Institutions – Public trust in politicians), pillar P3 (P3: Macroeconomic environment – Government debt) and pillar P11 (P11: Business sophistication – Nature of competitive advantage). All three pillars, identified as crucial to the development of the overall Slovakia's GCI scores, occupy unflattering positions in the comparison of pillar rankings. Therefore, we conclude that it is necessary to clarify the causes of their development and eliminate these identified factors as soon as possible. The results can be seen as beneficial to countries' economic policies in increasing global competitiveness.

Keywords: competitiveness, global indexes, multi-criterial approach, key pillars, key factors, regression analysis, regression model

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1. Introduction

Currently, the issue of competitiveness is the object of many economic analyses, but there is no internationally unified interpretation and understanding of this concept. Competitiveness is still one of the key indicators of the performance assessment of economies and a "mirror" of the success of countries at the global level. The way of assessing the level of competitiveness is difficult as well as the definition and understanding of the concept itself (Staníčková, Melecký 2011). As reported by authors Ivanová, Kordoš, Habánik (2015), the international competitiveness represents one of the alternative performance economic indicators which allows monitoring of all important factors that affect not only economic performance but also many social aspects and social maturity of the country. However, despite all the definitions, in professional literature there is no clearly defined attitude to the issue of competitiveness as well as its measurement and the way of expression. As reported by Loo (2012), the most respected organizations dealing with the assessment of nation's competitiveness at the global level are the World Economic Forum (WEF) and the Institute for Management Development (IMD). Both institutions are Switzerland – based institutions and use macro and microeconomic concepts to study the efficiency of the public and private sector as well as the overall infrastructure that forms and affects national competitiveness. For this reason, we decided to focus on the analysis of the competitiveness indexes methodology – the Global Competitiveness Index (GCI) and the World Competitiveness Index (WCI) that are created by mentioned institutions; another purpose was to identify the key factors improving the countries' competitive position on the international market.

The World Economic Forum (WEF) defines competitiveness as "the set of institutions, policies and factors that determine the level of productivity of the country". Productivity of the country means a country's ability to maintain a high level of income, but it is also one of the main factors influencing the return on investment that reflects the growth potential of the specific economy. In summary, competitiveness is understood as the ability of the country to achieve sustained high growth rates of GDP per capita (Sala-i-Martin et al. 2015). The Institute for Management Development (IMD) provides another definition of competitiveness in its yearbooks (IMD: World Competitiveness Yearbook 2014). It defines this term as an area of economic theories which analyses all the facts and policies forming the country's ability to create and continually construct an environment maintaining enterprise value creation, prosperity and well-being for its people. World competitiveness is understood as the country's ability to manage overall available resources and opportunities in order to increase the prosperity of its inhabitants.

2. Literature Review of the Selected Empirical Studies

Many empirical studies have been dealing with the analysis of the countries' global competitiveness based on the international and reputable indexes (Tomčík, Bondareva 2015; Chudárková 2012; Popescu, Sima, Nica, Gheorghe 2017; Majerová, Horúcková 2014; Nečadová 2015; Despotović, Cvetanović, Nedić, Despotović 2016 and others). Another group of authors is focused on the comparison of countries' competitiveness measured specifically by the GCI and WCI scores and their positions within the world rankings. Balcarová (2015) studied whether the differences in competitiveness among individual EU economies by using the GCI and WCI indicator are during the analysed period decreasing or not. The convergence was confirmed only in the case of using the GCI indicator. More detailed analysis of the methodical background and possible subjectivity of indexes GCI and WCI was provided also by Dudáš (2013). Author focused mainly on the role of business sector in the creation of these indexes. The analysis of changes and the current position in competitive rankings of this informal group of Central European countries was also performed by Ružeková, Kašťáková, Žatko (2016). However, the results were compared with other multi-criteria index – Doing Business Index (DBI). Tokárová (2015) also analysed the theoretical views on the issues of national economies' competitiveness based on the indexes GCI, WCI and

another one – SCI (Sustainability – Adjusted Global Competitiveness Index). Based on the data provided by the WEF and IMD, author Loo (2015) focused on the competitiveness analysis of the BRIC nations over the 15 years. He identified the key challenges faced by each nation and highlighted the implications for the future development and proposed three factors that may have influenced the results: democracy, colonialism and religion. In another study, Loo (2012) investigated the competitiveness of the top five nations during the decade from 2000 to 2009. On the basis of the GCI and WCI positions' development and trends, he subsequently forecasted the top five nations in the next decade from 2010 – 2019. The contribution was also devoted to the comparison of the calculation methodology within the both indexes. The analysis of selected factors within certain pillars was done in the study by authors Mikušová Meričková, Nemec, Murray Svidroňová, Pischko (2017). To keep up with global and national competition require to follow up the level of gross domestic product as one of the main indicator measuring economic sustainability. This conclusion reached Jurigová, Tučková, Solenes (2017) in their study. Different view is provided in study by Gavurova, Virglerova, Janke (2017). They trying to find the answer how fast can changes in trust on economic growth and other determinants are visible in changes in economic growth and competitiveness of countries. Dobrovič, Korauš, Dančišinová (2016) analyzed sustainable economic development of Slovakia differently, through factors determining optimal tax collection.

3. Objectives, Methodology and Methods

Early concepts of measuring the competitiveness at the international level began to emerge since the 1980s. According to authors Ochotnický, Lajzová, Kiseľáková (2011), the assessment methodologies relating to global competitiveness have been adjusted to correspond with the current globalization trends in the world economy. As reported by Abrahám, Herget (2013), approaches of institutions assessing competitiveness differ from each other according to the number and type of selected indicators, weights allocated to them or other particular approaches for their evaluation. Some institutions are focused on institutional quality and the role of government in the country, while others put emphasis on the technological aspects of competitive advantage. Another group of institutions prefer multi-criteria evaluation based on many different indicators grouped into various areas. Gordiaková (2011) adds that despite differences in the methodologies used to assess competitiveness by using different approaches (e.g. by using indexes with applications for statistical resources), most of methods are connected by high multi-criteriality and complexity. The main aim of research study is to analyse the objectivity and resulting values' deviations of the GCI and WCI composite indexes within the group of EU(24) countries during the years 2006 – 2016 and to identify the impact of key factors that affect the countries' competitive positions with a focus on Slovakia.

The first partial aim is to summarize the main WEFs' and IMDs' approaches used to compile the GCI and WCI indexes while pointing out to their common features and different approaches that cause different results and also affect their information value. The second partial aim is to analyse the development of positions in rankings as well as the modified GCI and WCI score within the EU(24) countries. We were focused on revealing the deviations of resulting values in the case of both indexes, which were caused by application of different methodology. Subsequently, we analysed the differences between the countries' final positions in rankings and the final GCI and WCI scores of selected countries. The third partial aim was to analyse the Slovakia's position within the rankings by means of the correlation and multiple regression analysis and also reveal the interconnections among individual pillars and the overall GCI score to identify the impact of key factors that improve or worsen its position and also affect the competitive position and sustainable growth of the Slovak Republic.

Based on defined objectives, the following research questions are set out in the study:

RQ1: What are the main differences in approaches and methodology of creating the GCI and WCI indexes that cause the deviations in the resulting score of national economies?

RQ2: Did the EU(24) countries achieve the same positions within the world competitiveness rankings created by WEF as well as by IMD in years 2006 – 2016?

RQ3: Which factors can be considered as the key factors influencing a better position and criteria for sustainable economic growth in the analysed countries with a focus on Slovakia?

In order to meet the data completeness condition and to increase the effectiveness of the results comparison, we had to make two adjustments:

- Based on the WEFs' and IMDs' world rankings we created a modified ranking of the European Union countries during the same period 2006 – 2016. We were forced to exclude 4 countries (Cyprus, Malta, Lithuania and Latvia) as they were not included in the IMDs' world rankings or did not provide all the data necessary for the correct comparison of the same number of selected countries.
- The GCI score ranges from 0 to 7, but the WCI score is in the range from 0 to 100. This difference complicated the countries' comparisons so the resulting WCI scores were transformed by a simple adjustment of the original upper range to a score moving in the same range as the GCI index:

$$WCI_a = (WCI_b / 7) * 100$$

where WCI_a – WCI adjusted,
 WCI_b – WCI basic.

For the purposes of meeting the objectives of this study, we performed a correlation and multiple regression analysis among selected variables in the analytical part 4 with a focus on Slovakia. Within the correlation analysis, we were concentrated on examining the interdependencies among the individual pillars of the GCI(SR – Slovak Republic). The regression analysis is a summary of statistical methods and procedures that are used to study the interaction among two or more variables (usually numeric), by means of a regression model. The aim of the regression analysis is:

- finding the regression equation that describes the relationship between the studied variables,
- coefficient estimates as a confirmation of the theory of the relationship between the variables,
- prediction of the dependent variable values and finding an impact of key variables as key factors.

For analyzing the relationship among variables, a linear regression model was used (Schneider, Spieth 2013). This model was adapted to investigate the relationship among one dependent variable and independent variables. The regression model is a mathematical relationship that simply characterizes relation among variables. In our study we expressed the dependence of the Y variable (GCI) values on the selected independent X variables (Pillars 1-12 in GCI) analyzed in the section 4.5.

3.1 Global Competitiveness Index (GCI) and Calculation Methodology

Since 2005, the internationally reputable organization World Economic Forum has based its analysis of the competitiveness on the Global Competitiveness Index (GCI), a comprehensive tool integrating microeconomic and macroeconomic aspects of national competitiveness into one overall index. The GCI index captures the fact that government and business leaders have known for a long time: competitiveness is a complex phenomenon and the overall level of competitiveness of the country can be improved only through a wide range of reforms in different areas. The GCI index also highlights the fact that countries have different priorities depending on their level of development. The primary goal of this institution is to provide certain overview to all interested parties and stimulate discussion about best strategies and policies that can help countries to overcome barriers of increasing their competitiveness (Sala-i-Martin et al. 2014). As reported by Gordiaková (2011), the Global Competitiveness Index is composed of 12 general economic pillars which play an important role in its quantification. Individual pillars are integrated into three groups on the basis of their content and orientation and they are called "sub-indexes" according to the theory of M. Porter – basic requirements, efficiency enhancers and

innovation and sophistication factors. Thus, we can divide the national economies into three stages of development and two "in transition" stages based on the per capita GDP per capita and the share of mineral goods in total exports. We can explore the ability of increasing the national economy through a set of factors, policies and institutions that indicate the level of productivity of the country.

The weights of the individual subindexes are different depending on the stage of development of economies, whereas the weights of individual indicators remain constant. For countries considered to be "in transition", the weights change smoothly as a country develops, reflecting the smooth transition from one stage of development to another. The GCI indicator "penalizes" those countries that are not ready for progress to the next stage of development (Ivanová, Kordoš 2015). Computation of the GCI indicator is based on successive aggregations of scores from the individual indicator level (the most disaggregated level) all the way up to the overall score of the GCI indicator.

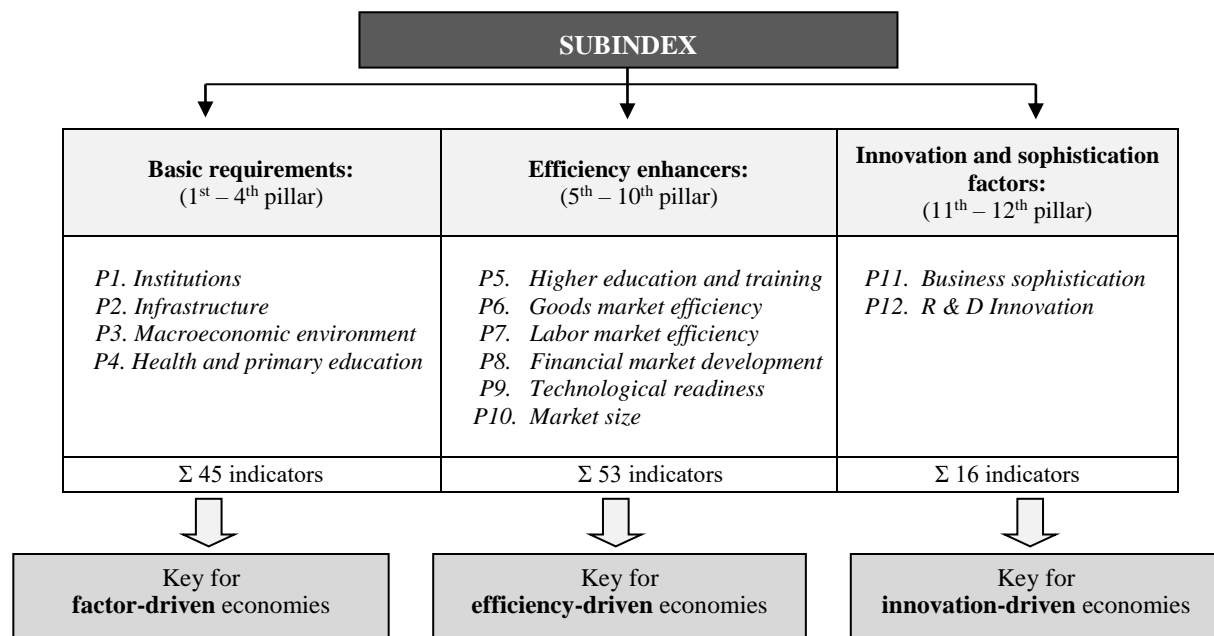


Fig.1. The Global Competitiveness Index Framework
Source: Sala-i-Martin et al. (2016)

As reported by Paraušić, et al. (2014), the WEF evaluates international competitiveness by the GCI indicator which is based on large number of variables grouped into 12 basic pillars of competitiveness. To assess these variables are used so-called "soft and hard data". "Hard data" are gathered from publicly available sources (International Monetary Fund, World Bank, UNESCO, World Health Organization, etc.). "Soft data" are received by the Executive Opinion Survey (EOS) performed in each partner country. Respondents express their degree of agreement or disagreement with the survey statements on a scale from 1 to 7, where 1 represents the worst possible situation and 7 the best possible situation. The definition of the individual factors according to the pillars (P1-P12) is closer defined in the article "Analytical View on the Competitiveness Development in the Slovak Republic and in the EU" (Kiseľáková, Šofranková, Čabinová 2016).

3.2 World Competitiveness Index (WCI) and Calculation Methodology

The World Competitiveness Yearbook has been published by the Institute for Management Development (IMD) since 1989 and it is regarded to be the most comprehensive report concerning the competitiveness of countries. Based on the World Competitiveness Index (WCI) countries are analysed and ranked according to their ability to use competencies and opportunities to achieve a higher prosperity. The overall economic environment of countries can be divided into four key factors and each of these factors is made up of five other subfactors (IMD 2014). Gordiaková (2011) adds that the each sub-factor has the same weight (5 %) that is fixed and independent on the number of criteria it contains.

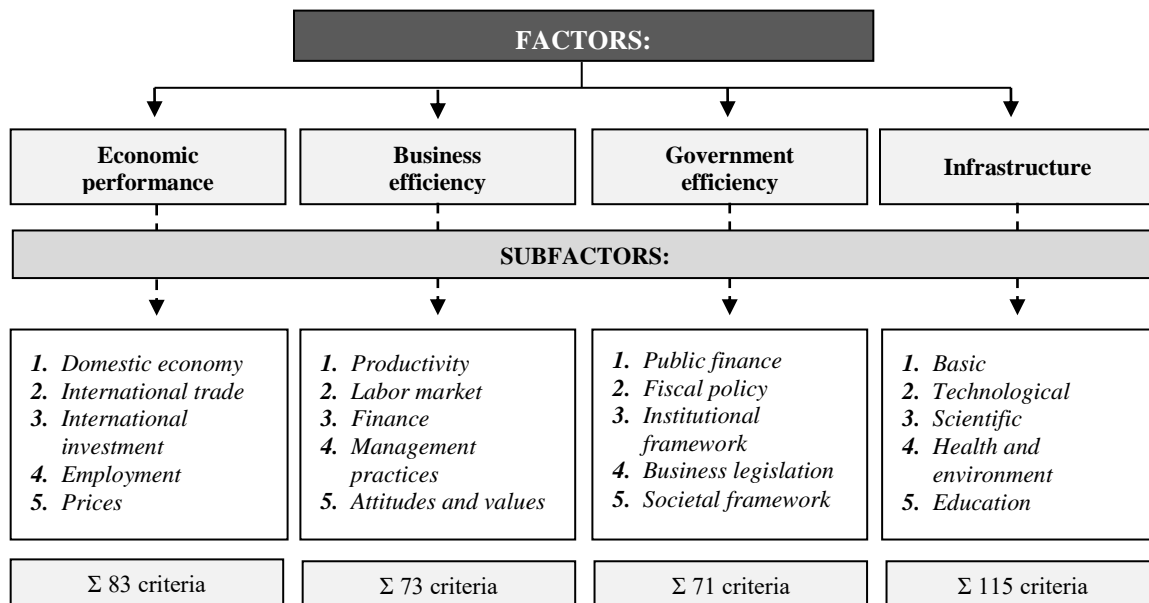


Fig.2. The World Competitiveness Index Framework
Source: Bris (2016)

As reported by Dudáš (2012), the first factor "*Economic performance*" is aimed at evaluating the domestic macroeconomic environment, international trade and investment, the actual state and development of employment and prices. Within the group of subfactors "*Business Efficiency*" the attention is paid to the evaluation of labor market and its productivity, the situation and future trends in the financial market but also practices of managers, their know-how, values or attitudes. The factor "*Government Efficiency*" examines the state of public finances, fiscal policy of the state, legislation relating to the business environment and societal framework of the economy. The last factor "*Infrastructure*" assesses the availability and the level of different types of infrastructure (basic, technological, scientific, medical or educational).

The IMD relies on secondary (hard) data and primary (soft) data to quantify the competitiveness of countries. Secondary data, so called "hard" statistical data are easily quantified and they are compiled from international, national and regional organizations, for example the OECD, World Bank, United Nations and many other partner institutes around the world. "Soft" data are complement to the "hard" data in order to help measure competitiveness issues that are not easily quantified, for example perception of corruption, quality of life, management practices, labor relations, environmental concerns and many others. They are compiled from annual Executive Opinion Survey (EOS) which provides actual and more detailed information reflecting economic reality in the country. The survey is sent to participants – top managers and answers are detected as a measure of

agreement or disagreement with the prepared questions or statements. The survey is conducted from January to April and responses are returned directly to IMD headquarters (IMD 2016).

4. Results and Discussion

4.1 Comparison of Basic Approaches to Global Competitiveness by the WEF and IMD

To answer the RQ1 we have focused on summarizing and evaluating the common features, advantages, disadvantages and differences in the methodology applied to the construction of the GCI as well as WCI index. These findings have been gathered primarily from the Global Competitiveness Report (GCR) and the World Competitiveness Yearbook (WCY). The intention was to provide a brief overview of the different approaches and overall activity of these institutions that were reflected in the deviations of score achieved and countries' positions within the competitiveness rankings.

At first, we have focused on assessing common features of the WEFs' and IMDs' approaches to global competitiveness:

- both institutions publish rankings and comprehensive global competitiveness reports and compare significant world economies every year,
- both institutions are accepted at a high level by the governments of involved countries, therefore they are considered the most authoritative in the world,
- both institutions use various and very similar data in the processing of results – statistical data (gross, quantitative) as well as the data obtained as a result of the questionnaire survey (soft, qualitative),
- country assessment methodology for both institutions is based on the same theoretical concept (multi-criteria approach),
- the methodology, number of indicators and participating countries within the WEFs' and IMDs' reports are changing almost every year which complicates result comparability over time,
- the interpretation of the results is the same for both institutions – higher score of the GCI or WCI indicator means higher competitiveness.

Subsequently, we have analyzed the WEFs' approaches to global competitiveness and summarized them into the following points:

- a) the WEF equates competitiveness with productivity that sets a sustainable level of prosperity that a country may achieve,
- b) the WEF focuses on the government's role in providing a rising living standard to their citizens,
- c) the GCI indicator tries to reflect why some *countries* have been better at providing high and rising living standard to their citizens than others,
- d) the WEF released its first Global Competitiveness Report in 1979,
- e) the WEFs' full reports are publicly available without any fees,
- f) the WEF is currently conducting a Global Competitiveness Survey in 138 countries and cooperating with 160 partner institutions,
- g) the competitiveness of countries is evaluated through the GCI indicator which is based on 12 pillars grouped into 3 subindexes whereas the weights of individual subindexes depends on the country's development,
- h) overall, the GCI indicator includes 114 individual indicators, primary data ("soft data") represents about 2/3 of the total data, the remaining 1/3 consist of secondary data ("hard data") (Blanke 2011; Loo 2015; Sala-i-Martin et al. 2015; Sala-i-Martin et al. 2016).

By analogy, we examined the IMDs' approaches to global competitiveness in identical areas:

- a) the IMD equates competitiveness with a combination of competencies in economic growth and mindset in value-added areas,
- b) the IMD suggests collaboration between governments and enterprises to manage resources to achieve sustainable progress,
- c) the WCI indicator focuses on how *nations and enterprises* manage the totality of their competitiveness to achieve long-term prosperity,
- d) the IMD released its first World Competitiveness Yearbook in 1989,
- e) the IMDs' full yearbooks are available for a fee,
- f) the IMD is currently conducting a World Competitiveness Survey in 61 countries and cooperating with 55 partner institutions,
- g) the competitiveness of countries is evaluated through the WCI indicator which is based on 4 key factors divided into a total of 20 subfactors whereas the weights of individual subfactors are fixed (5 %),
- h) overall, the WCI indicator includes 342 individual criteria,
- i) primary data ("soft data") represents about 1/3 of the total data, the remaining 2/3 consist of secondary data ("hard data") (IMD 2016; Loo 2015).

4.2 Analytical View of the EU(24) Countries' Competitive Position in the WEFs' and IMDs' Rankings

The following part of the paper is focused on the analysis and comparison of the EU(24) countries' competitive position development over the years 2006 – 2016 in the context of the GCI and WCI indexes. The resulting WCI scores were transformed by a simple adjustment of the original upper range to a score moving in the same range as the GCI index. This adjustment was necessary in order to make the comparison of those indexes easier.

During the years 2006 – 2016, the average GCI score for the selected European countries was at the level of 4.79; WCI's average score achieved a slightly lower value (4.72). The development of the average GCI score within the EU(24) countries had a relatively stable trend, scores ranged from a minimum value of 4.73 recorded in 2009 and 2010, up to the maximum value of 4.93 reached in 2006. Overall, the highest score of the GCI indicator was reached by Finland in 2006 (5.76), vice versa, the lowest values was indicated in 2009 and 2010 by countries such as Bulgaria, Romania or Greece. This fact was caused also by consequences of the financial and economic crisis. However, the positive fact has occurred since 2013 and the development of the GCI score of the EU(24) countries has recorded a growing trend.

The competitiveness development of the EU(24) countries over the years 2006 – 2016 quantified on the basis of the WCI indicator was fluctuating and unstable, especially from 2006 to 2012, when the average WCI values ranged from 4.41 to 4.96. In the following two years, the negative trend continued constantly. Even in 2014, the WCI average score stagnated almost at the same level as in year 2008. Fortunately, since this critical year the development of the average WCI score has improved significantly and it has increased by 15.53 % to the level of 5.23. When comparing the average GCI score development, we can notice much more progressive positive trend, but at the expense of stable development of the average WCI scores within the EU(24) countries. Overall, the highest average WCI score was unlike the GCI score achieved in 2016 (5.23), the lowest value was recorded in 2006. It is interesting that the most successful year in the case of GCI's best score was year 2006.

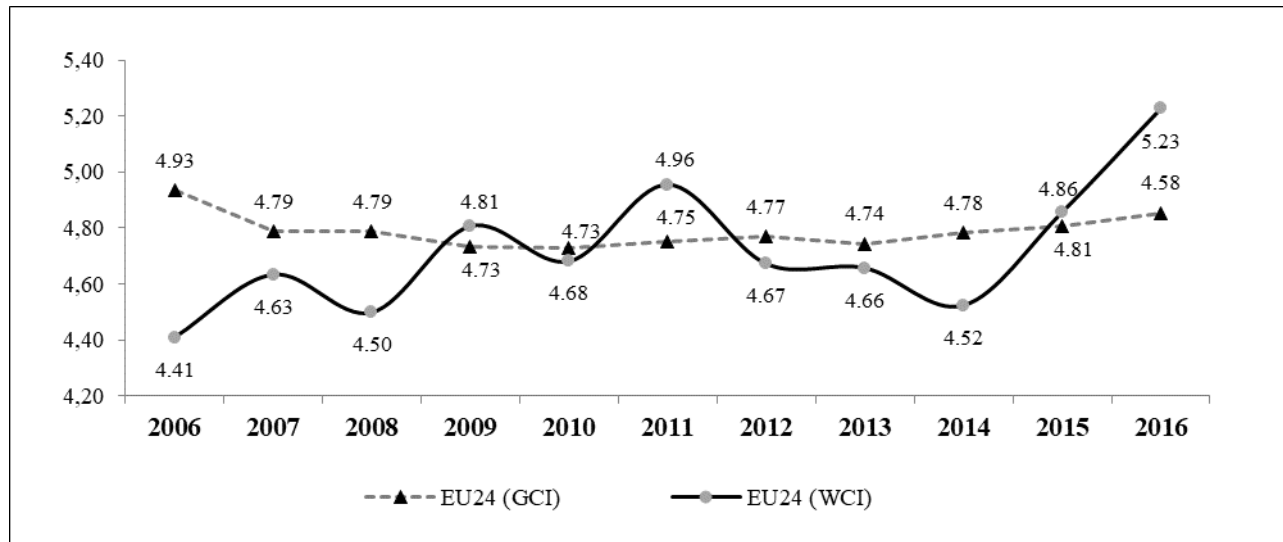


Fig.3. Development analysis of the GCI and WCI_a scores within the EU(24) countries over the years 2006 – 2016

Source: own processing based on the WEFs' and IMDs' annual reports and datasets

In conclusion of performed competitiveness analysis of the EU(24) countries it is necessary to note the following facts:

- During the analysed years 2006 – 2016, the average GCI score of the EU(24) countries has decreased by 1.62 %, vice versa, the positive increase of 18.52 % was noticed in the case of the average WCI score. This fact undoubtedly gives rise to some confusion and questions about the actual competitiveness development within the group of EU(24) countries.

4.3 Comparison of the EU(24) Countries' Competitiveness Development Based on the WEFs' and IMDs' Rankings

After assessing the GCI and WCI development within the EU(24) countries during the monitored years 2006 – 2016 we have analysed the development of their positions within the WEF and IMD rankings.

Based on the average GCI score, the top performers within the EU were Sweden (5.53), Finland (5.50) and Germany (5.48). It is interesting that the overall GCI score of these countries have decreased, but countries were able to maintain the high rankings and do not let the GCI score fall below the level of 5.30. The biggest decrease of 6.25 % in the GCI score to the value of 5.40 was recorded in the case of Finland. In the recent years, the Sweden's leadership within the EU(24) countries has been threatened. Germany is becoming the biggest favourite, its score in 2016 (5.60) was the highest among all EU(24) countries and during the analysed years 2006 – 2016 the score did not drop by 1 %. The weakest members of the analysed group are countries such as Greece (4.03), Croatia (4.12) and Romania (4.14), whose average GCI score was deep below the EU(24) countries. Based on the average GCI values, the Slovak Republic ranked 20th during the years 2006 – 2016; however, its average position has been continually improving since 2013. The strongest negative drop by 4 positions in the WEF rankings in 2016 compared to 2006 was recorded for countries such as Denmark, Finland, Greece, Hungary, Slovakia and Slovenia. On the other side, the most significant positive shift by 5 positions and more was recorded in the case of Bulgaria and Poland.

Table 1. Comparison of the EU(24) countries' positions within the WEFs' and IMDs' rankings

	2006		2016		Position changes (2006 – 2016)		Average position (Ø 2006 – 2016)	
	WEF	IMD	WEF	IMD	WEF	IMD	WEF	IMD
Austria	7	5	10	10	-3	-5	7	8
Belgium	9	11	7	9	3	2	8	10
Bulgaria	24	20	19	22	6	-2	21	21
Croatia	22	24	23	24	-1	0	23	24
Czech Republic	14	12	14	11	1	1	14	13
Denmark	3	1	7	2	-4	-1	5	1
Estonia	12	8	12	12	0	-4	12	12
Finland	1	3	5	8	-4	-5	2	6
France	8	13	10	13	-2	0	9	11
Germany	4	10	2	6	3	4	3	5
Greece	20	17	24	23	-4	-6	24	23
Hungary	18	16	22	20	-4	-4	19	18
Ireland	10	4	10	3	1	1	11	7
Italy	19	21	17	16	3	5	17	19
Luxembourg	11	2	10	5	2	-3	10	2
Netherlands	5	7	2	4	4	3	4	4
Poland	21	23	15	14	6	9	16	16
Portugal	16	18	17	17	-1	1	15	15
Romania	23	22	21	21	3	1	22	22
Slovak Republic	17	15	21	18	-4	-3	20	17
Slovenia	15	19	19	19	-4	0	18	20
Spain	13	14	14	15	-1	-1	13	14
Sweden	2	6	4	1	-2	5	1	3
United Kingdom	6	9	4	7	3	2	6	9

Source: own processing based on the WEFs' and IMDs' annual reports and datasets

Based on the average WCI score reached by the EU(24) countries during the years 2006 – 2016, the competitive leaders were definitely Denmark (6.09), Luxembourg (6.04) and Sweden (5.95) whose resulting scores increased on average by 12.35 % compared to 2006. In 2016, originally leading Finland ranked up to 6th position on average with the WCI score at the level of 5.63, but its position has been threatened by Ireland in recent years. Over the analysed period, Germany (5.80) reached 5th position on average within the EU(24) evaluated countries. The lowest WCI scores were reached by Croatia (3.09) and country was significantly behind the other national economies. The penultimate position belonged to Greece (3.54) and 3rd position as the worst competitive economy over the years 2006 – 2016 was reached by Romania (3.56). Since 2012, Romania has acquired a positive trend of development and threatens countries like Bulgaria or Slovakia. The most significant drop in EU(24) IMD rankings was recorded in the case of Greece that dropped from its initial 17th place in 2006 to the penultimate position in 2016. A similar negative decline also occurred in Finland and Austria which dropped by 5 positions compared to the 2006. On the other hand, the most significant positive shift (9 positions up) was recorded in the case of Poland.

After assessing the EU(24) countries' position development within the WEFs' and IMDs' rankings, we finally focused on summarizing their resulting average positions over the years 2006 – 2016 in order to reveal the most significant deviations in countries' positions and also answer a RQ2:

- The identical average position in the WEFs' and IMDs' rankings was reached in the case of Bulgaria, Estonia, Netherlands, Poland, Portugal and Romania.
- The worse average position in the WEFs' rankings compared to the IMDs' rankings were reached by Luxembourg (8 positions), Ireland (4 positions), Denmark (4 positions), Slovakia (3 positions), Hungary (1 position), the Czech Republic (1 position) and Greece (1 position).
- The worse average position in the IMDs' rankings compared to the WEFs' rankings were achieved in the case of Finland (4 positions), England (3 positions), Italy (2 positions), Belgium (2 positions), France (2 positions), Germany (2 positions), Sweden (2 positions), Austria (1 position), Croatia (1 position) and Spain (1 position).

4.4 Quantification of Interdependencies Among Pillars of the GCI(SR) by Applying Correlation Analysis

In the next part, we aimed at the deeper cause analysis of the global competitiveness development in the case of Slovakia and examined the interdependencies among the individual pillars of the GCI(SR). The correlation analysis was performed only for the GCI index for the period 2006 – 2016 because of the limited WCI's input information. The overview of the GCI(SR) pillars' development and its average values for the selected years representing the input variables of the correlation analysis are presented in Table 2. Statistically quantified correlation among individual pillars are shown in Table 3.

Table 2. Development of the GCI(SR) pillars and GCI(SR) average scores over the years 2006 – 2016

	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th	9 th	10 th	11 th	12 th	GCI(SR)
2006	3.98	3.72	5.41	5.95	4.45	4.59	4.73	4.95	4.12	4.16	4.21	3.43	4.55
2007	3.99	3.78	4.92	5.88	4.42	4.66	4.76	5.02	4.08	3.81	4.26	3.42	4.45
2008	3.85	3.64	5.31	5.82	4.43	4.71	4.67	5.04	4.35	3.94	4.33	3.28	4.40
2009	3.74	3.89	5.14	5.68	4.37	4.67	4.78	4.82	4.61	4.05	4.29	3.12	4.31
2010	3.60	4.19	5.20	6.07	4.49	4.34	4.66	4.61	4.48	3.97	4.12	2.95	4.25
2011	3.46	4.23	4.92	6.04	4.50	4.36	4.47	4.44	4.54	3.99	4.00	2.91	4.19
2012	3.44	4.23	4.87	6.03	4.50	4.37	4.20	4.45	4.46	4.00	4.02	2.98	4.14
2013	3.32	4.12	4.91	6.07	4.44	4.25	4.24	4.49	4.16	4.03	3.95	3.02	4.10
2014	3.33	4.21	5.23	5.55	4.65	4.36	3.95	4.50	4.37	4.03	4.00	3.18	4.15
2015	3.40	4.30	5.20	6.00	4.60	4.40	3.90	4.40	4.60	4.00	4.10	3.30	4.22
2016	3.50	4.20	5.30	6.00	4.50	4.50	4.00	4.60	4.80	4.00	4.10	3.30	4.30

Source: own processing based on the WEFs' and IMDs' annual reports and datasets

Table 3. Correlation analysis of the GCI(SR) pillars

Correlations among GCI and scores of GCI Pillars. Marked correlations are significant at $p < 0.05$ ($p^* < 0.01$)												N = 11
Kendall Tau	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th	9 th	10 th	11 th	12 th
GCI(SR)	0.8182	-0.5138	0.4630	-0.3149	-0.3740	0.5872	0.4545	0.5636	-0.0545	-0.1699	0.6853	0.5138
p (value)	0.0004*	0.0278	0.0474	0.1776	0.1093	0.0119	0.0516	0.0158	0.8153	0.4669	0.0033*	0.0278

Source: own processing in programme STATISTICA

The analyzed correlation among the overall GCI score and its individual pillars was confirmed in the case of 7 pillars: P1; P2; P3; P6; P8; P11; P12. The most significant dependence (0.8182) was found for the pillar *P1: Institutions* whose score reached the average value of 3.60 during the years 2006 – 2016 (see Table 4). Compared to other pillars we can consider this pillar as the second worst pillar. Based on the results, pillar *P1: Institutions* is key to the development of the GCI (SR) and it is essential to eliminate the causes to improve global competitiveness. Fabuš (2015) also points out that conditions for business of a state have an influence on its attractiveness for potential foreign investments.

4.5 Regression Analysis of the GCI(SR) Development Trend Within Individual Subindexes

On the basis of the regression analysis, we then analyzed the causal relations to maximize the output variable. In this case, it represents the output variable GCI(SR) (y). The purpose was to quantify the impact of individual pillars on the total index score, to identify the key factors that determine the country economic growth and to find out what change of pillars leads to the improvement/decline of the Slovakia's competitive position (to investigate the answer for RQ3).

Table 4. Average values of the GCI(SR) pillars over the years 2006 – 2016

Slovak Republic	Ø 2006 – 2016
P12: R&D Innovation	3.17
P1: Institutions	3.60
P10: Market size	4.00
P2: Infrastructure	4.05
P11: Business sophistication	4.13
P7: Labor market efficiency	4.40
P9: Technological readiness	4.42
P6: Goods market efficiency	4.47
P5: Higher education and training	4.49
P8: Financial market development	4.67
P3: Macroeconomic environment	5.13
P4: Health and primary education	5.92

Source: own processing based on the WEFs' and IMDs' annual reports and datasets

The first subindex "Basic requirements" consist of 4 pillars (*P1: Institutions*, *P2: Infrastructure*, *P3: Macroeconomic environment* and *P4: Health and primary education*). The results of the statistical output of the estimated variables for the GCI are shown in Table 5.

Table 5. The statistical output of the estimated variables within subindex "Basic requirements"

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,9819
R Square	0,9642
Adjusted R Square	0,9403
Standard Error	0,0343
Observations	11

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	4	0,1896	0,0474	40,4072	0,0002
Residual	6	0,0070	0,0012		
Total	10	0,1967			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	0,7378	0,8381	0,8804	0,4125	-1,3128	2,7885	-1,3128	2,7885
1 st Pillar	0,5286	0,1034	5,1120	0,0022	0,2756	0,7817	0,2756	0,7817
2 nd Pillar	0,0462	0,1109	0,4163	0,6917	-0,2253	0,3177	-0,2253	0,3177
3 rd Pillar	0,2079	0,0620	3,3547	0,0153	0,0563	0,3595	0,0563	0,3595
4 th Pillar	0,0648	0,0724	0,8956	0,4049	-0,1123	0,2420	-0,1123	0,2420

Source: own processing

The resulting of regression analysis expresses and confirms the logical, directly proportional relation among the pillar *P1: Institutions*, pillar *P3: Macroeconomic environment* and the overall GCI(SR) score. It means that the rise in the value of any of these 2 pillars will cause an increase in the total value of indices. The statistically significant relationship was not confirmed for the other pillars. The determination factor (R^2) is 0.9642, which means that our model explains up to 96.42 % of variability. Significance F value is 0.0002, therefore we can state that the model has predictive capability. As the variables presents, the degree of impact of changing individual pillars varies. The regression analysis indicates that increasing the value of the pillar *P1* by one unit will cause an increase in the overall index value by 0.5286 points and increasing the value of the pillar *P3* by one unit will cause an increase of GCI value by 0.2079 points. In the previous analysis (see Table 4), we found out that pillar *P1: Institutions* reached the second lowest average score (3.60) compared to all other pillars and it reached the penultimate position within the pillar rankings. On the basis of these results we can conclude that pillar *P1: Institutions* (especially Public trust in politicians) is a key determinant of Slovakia's global competitiveness.

The second and largest group of sub-indexes "Efficiency enhancers" is composed of 6 pillars (*P5: Higher education and training*, *P6: Goods market efficiency*, *P7: Labor market efficiency*, *P8: Financial market development*, *P9: Technological readiness* and *P10: Market size*). The results of the statistical output of the estimated variables for the GCI are presented in Table 6.

Table 6. The statistical output of the estimated variables within subindex "Efficiency enhancers"

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,9170
R Square	0,8409
Adjusted R Square	0,6021
Standard Error	0,0885
Observations	11

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	6	0,1654	0,0276	3,5225	0,1216
Residual	4	0,0313	0,0078		
Total	10	0,1967			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	-2,1139	3,8277	-0,5523	0,6102	-12,7412	8,5134	-12,7412	8,5134
5 th Pillar	0,4219	0,5954	0,7087	0,5176	-1,2311	2,0749	-1,2311	2,0749
6 th Pillar	0,1251	0,6228	0,2009	0,8506	-1,6041	1,8544	-1,6041	1,8544
7 th Pillar	0,0513	0,1697	0,3026	0,7773	-0,4197	0,5224	-0,4197	0,5224
8 th Pillar	0,5036	0,5079	0,9915	0,3776	-0,9066	1,9138	-0,9066	1,9138
9 th Pillar	0,0361	0,2159	0,1674	0,8752	-0,5634	0,6357	-0,5634	0,6357
10 th Pillar	0,3012	0,3408	0,8840	0,4266	-0,6449	1,2473	-0,6449	1,2473

Source: own processing

The regression results didn't confirms the logical and directly proportional relation between the pillars *P5 to P10* and the overall GCI(SR) score, because significance F value is higher than statistically significant level and in other words, the model has no predictive capability. The determination factor (R^2) is 0.8409, which means that model would explains up to 84.09 % of variability.

The last and smallest – but also the most important subindex – "Innovation and sophistication factors" consists of 2 pillars (*P11: Business sophistication* and *P12: R&D Innovation*). As reported by authors Illmeyer, Grosch, Kittler, Priess (2016) in the current competitive market, innovation has become a crucial element for organizations, willing to grow. The results of the statistical output of the estimated variables for the GCI are shown in Table 7.

Table 7. The statistical output of the estimated variables within the subindex "Innovation and sophistication factors"

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,8900
R Square	0,7921
Adjusted R Square	0,7402
Standard Error	0,0715
Observations	11

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2,0000	0,1558	0,0779	15,2443	0,0019
Residual	8,0000	0,0409	0,0051		
Total	10,0000	0,1967			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	0,7263	0,7194	1,0096	0,3422	-0,9326	2,3851	-0,9326	2,3851
11 th Pillar	0,6157	0,2140	2,8776	0,0206	0,1223	1,1091	0,1223	1,1091
12 th Pillar	0,3190	0,1480	2,1559	0,0632	-0,0222	0,6602	-0,0222	0,6602

Source: own processing

Finally, the last regression analysis has statistically confirm a direct relation between the pillar *P11: Business sophistication* and the GCI(SR). The determination factor (R^2) is 0.7921, which means that our model explains 79.21 % of variability. In this case also the model has predictive capability, because significance F value is 0.0019. We can state that the significant determinant of the overall GCI(SR) development is pillar *P11: Business sophistication*. The statistically significant relationship was not confirmed for the other pillar. The regression results indicate that increasing the value of this pillar by one unit will cause an increase in the value of the overall index by 0.6157 points. Over the years 2006 – 2016, a deeper analysis showed that this pillar was the 5th weakest pillar on average with a value of 4.13 (see Table 4). Taking into account the regression findings, we can conclude that pillar *P11: Business sophistication* is the third key determinant of the Slovakia's global competitiveness so it is necessary to identify the causes and try to eliminate them as soon as possible.

Table 8. The statistical output of the estimated variables for GCI by regression model

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,9836
R Square	0,9674
Adjusted R Square	0,9534
Standard Error	0,0303
Observations	11

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	3	0,1903	0,0634	69,2015	1,44061E-05
Residual	7	0,0064	0,0009		
Total	10	0,1967			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	2,0661	0,4132	4,9997	0,0016	1,0889	3,0433	1,0889	3,0433
1 st Pillar	0,5977	0,0798	7,4904	0,0001	0,4090	0,7864	0,4090	0,7864
3 rd Pillar	0,2217	0,0565	3,9272	0,0057	0,0882	0,3552	0,0882	0,3552
11 th Pillar	-0,2611	0,1622	-1,6103	0,1514	-0,6446	0,1223	-0,6446	0,1223

Source: own processing

$$\text{GCI}(\text{SR}) = 2.0661 + 0.5977 \cdot P1 + 0.2217 \cdot P3$$

In the end of study we formulate the final regression model by using the key determinants (pillar *P1: Institutions*, pillar *P3: Macroeconomic environment* and pillar *P11: Business sophistication*). Our model explains 96.74 % of variability, which means that the determination factor (R^2) is 0.9674. Significance F value is 1,44⁻⁵ and it means that model has predictive capability. As the regression analysis indicates the statistically significance relation was confirmed among pillar *P1: Institutions*, pillar *P3: Macroeconomic environment* and the value of GCI(SR). The statistically significant relationship was not confirmed for the other pillar. As the variables presents, increasing the value of the pillar *P1* by one unit will cause an increase in the overall index value by 0.5977 points and increasing the value of the pillar *P3* by one unit will cause an increase of GCI value by 0.2217 points. On the basis of these results we can state that our created model confirmed a statistically significant relation between pillar *P1*, *P3* and total GCI value.

5. Conclusions and recommendations

In terms of strategic development, all countries in the world as well as European countries would like to be competitive and able to secure sustainable economic growth in a long-term context. Creating a generally accepted and comprehensive model measuring the international competitiveness with the ability of sustainable growth is not a simple task. In the last few decades, many organizations dealing with this area have been created, but the diversity of results led to a lot of professional and research discussions about which methodological approach is more appropriate, objective, complex and more fulfils the condition of multi-criteriality.

This paper was focused on the objectivity and differences evaluation of the resulting GCI and WCI composite indexes within the EU(24) countries during the years 2006 – 2016 through an in-depth analysis of the approaches and calculation methodologies for both world rankings. The GCI and WCI indexes are considered the world's most respected, so it is difficult to clearly determine which of these rankings is the right one and can more objectively measure the countries' competitiveness. Both institutions and indexes compiled by them have advantages as well as disadvantages. The longer history of WEF compared to IMD is reflected in richer experiences and stable long-lasting partnerships. This creates the appropriate preconditions for undertaking a wider global study. The final score of GCI indicator is distorted by using especially the "soft data" that are less comparable because of subjective assessment of respondents. However, the WEF monitors many more countries and respondents in the survey than IMD which results in reducing the possibility of data distortion. The "soft data" also have another advantage – they can express difficult-to-quantifiable elements of competitiveness and their obtaining is not affected by time delay. The total number of criteria observed in the calculation of the WCI indicator considerably exceeds the number of individual indicators forming the complex structure of the GCI indicator. This combination with the prevalence of statistical data from different sources contributes to increasing the objectivity of the WCI indicator score. Complete Global Competitiveness Reports are publicly available on the WEF's websites without any charges. They provide certain overview to all interested subjects and lead them to discuss about issues of international competitiveness. On the other hand, the IMD's World Competitiveness Yearbooks are available in full version only for a fee, which is not negligible.

By analyzing the GCI and WCI scores achieved within the EU(24) countries over the analysed years 2006 – 2016, we found out that the average value of the GCI score for selected EU(24) countries was at the level of 4.79; for the WCI score it was slightly lower (4.72). The development of the average GCI score had a relatively stable trend, while in the case of the WCI index countries reached unstable scores. The average GCI score of the EU(24) countries has decreased by 1.62 %, vice versa, the positive increase of 18.52 % was noticed in the case of the average WCI score. This fact undoubtedly raises many questions about the real development of EU(24) countries' competitiveness. In order to reveal the most significant positions' deviation in these two world competitiveness

rankings we focused on summarizing the resulting average rankings of each country over the analyzed years and found out the following results:

- the same average position in the WEFs' and IMDs' rankings was revealed in the case of 6 countries,
- the worse average rank in the WEFs' rankings as IMDs' was recorded in the case of 7 countries,
- the worse average position in the IMDs' rankings than the WEFs' was revealed in the case of 11 countries.

Based on the results of the GCI(SR) regression analysis, we point out that the following economic and statistical developments were confirmed:

- within the first subindex "Basic requirements" are the key determinants of the Slovakia's global competitiveness pillars *P1: Institutions* (especially factor Public trust in politicians), and *P3: Macroeconomic environment*, especially factor Government debt;
- the third key determinant of the Slovakia's global competitiveness within the third subindex "Innovation and sophistication factors" is pillar *P11: Business sophistication*, especially factor Nature of competitive advantage;
- all pillars of the GCI(SR), except of the pillar *P3: Macroeconomic environment*, which were statistically and economically identified as key, were rated as one of the weakest and in the future it is necessary to identify the causes that prevent their progressive growth;
- a statistically significant relation among pillars P1, P3 and total GCI value on the basis of our created model.

Despite these reservations on approaches and methodology of measuring countries' competitiveness through these indices, we can state that the position of countries in world rankings and the achievements of both composite indexes (especially results in critical areas that pose a particular threat to sustainable growth of Slovakia, in particular, factors within the pillars P1, P11 and P12 (see Table 4) with the lowest average pillar values of the GCI(SR)) should be taken into account in the development of the national economic policy, but with a certain reserve. Country results are often distorted by adjusting the number of countries evaluated, so it is important to look at partial relative indicators as well as the development of the business environment in other competitive economies. Based on the results published by global organizations concerned with the national competitiveness we can state that countries that have placed in leading positions put the greatest emphasis on these factors – the knowledge economy, research, innovation, technology and IT sector. So all these factors we consider as key factors for global competitiveness and sustainable growth.

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A STUDY ON THE ANTECEDENTS OF ENTREPRENEURIAL INTENTIONS AMONG SAUDI STUDENTS

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Abstract. The present study has developed and tested a model based on Theory of Planned Behavior (TPB) with addition of some psychological variables to figure out the antecedents of entrepreneurial intentions of Saudi undergraduate business students. A sample of 550 students were taken. Responses were collected by a self administered questionnaire and analysed by using a univariate statistics and Partial Least Square (PLS) Structural Equation Modeling (SEM). The study has emerged with behavioral and personality antecedents (Attitude, Subjective Norm, Internal locus of control, need for achievement and propensity to take risk) of entrepreneurial intent among Saudi students. The results underpin the idea that personality factors along with the behavioral factors strengthen the predictability of intentions to be involved in an entrepreneurial behavior.

Keywords: entrepreneurial intentions; Theory of Planned Behavior (TPB); Partial Least Square (PLS); Structural Equation Modeling (SEM); Saudi students.

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JEL Classifications: C3, D91, L2, L26

1. Introduction

Entrepreneurship is a vehicle of economic growth; an instrument that facilitates employment generation, innovation, and competitiveness; and a catalyst of social development. Promotion of entrepreneurship is now accorded national priorities by many countries, specifically among developing ones (Gird & Bagraim, 2008; Karimi et al., 2015; Sulphey & Alkahtani, 2017). Being appraised of the indispensibility of entrepreneurship for delevering all round economic growth development and employment, the United Nations has included its promotion in the Sustainable Development Goals under the head Education and Economic Growth (UN, 2015).

Further, nurturing and encouraging entrepreneurship presents a solution to the employment issues – both among youth and adult population alike (Basheer & Sulphey, 2017; Sulphey & Alkahtani, 2017).

The largest economy in the Middle East and North Africa (MENA), Kingdom of Saudi Arabia (KSA) (IMF, 2017) gets its major revenue and contribution to GDP from oil sector. Being appraised of the need to strengthen and diversify the non-petroleum sector, the government of KSA has put forth several ambitious initiatives in its Ninth (2010-2014) and Tenth Development Plans (2017-2019) (Aloulou, 2016; Kayed & Kabir Hassan, 2011; WAMDA, 2017). The “Vision 2030”, an economic blue print for national economic growth looks towards entrepreneurship and private sector to take a leading role in economic development. It is expected that this focus will facilitate job creation and competitiveness. The introduction of the Small and Medium Enterprise Authority (SMEA) – recently branded as “Monsha’at”; signals the bright future of entrepreneurial ventures in KSA. As on date the government has implemented many initiatives, including large scale public awareness programs focused on the access to capital and support for startups. Further, “NEOM” a new city in line with Silicon Valley is also planned to be instituted in the country. The importance accorded by KSA towards entrepreneurship can be judged from the allocation of 2.4% of GDP for its promotion (SAGIA, 2016). But despite this hue and cry Saudi Arabia ranked 53 out of 66 in the recent GEM Report in the government entrepreneurship program (GEM, 2017). And 61 out of 66 ranks in the entrepreneurship education at school and post school stage (GEM, 2017).

In the light of above background it is high time to measure the readiness of entrepreneurship among the population in KSA. The entrepreneurial intention must be inculcate first to develop the entrepreneurial behaviour, activities and culture as a whole. As it has been noted that entrepreneurial intentions are best predictors of entrepreneurial behaviors and activities (Aloulou, 2016; Kautonen et al., 2015; Krueger et al., 2000; Lüthje & Franke, 2003). Moreover, Entrepreneurial Intention (EI) is considered as the sapling of an entrepreneurial tree and first step towards the creation of new venture (Iakovleva et al., 2011; Karimi et al., 2015). This is considered as one of the reasons for the present study. Moreover limited number of researches on the intentions of Saudi students (Ali, 2016; Almobaireek & Manolova, 2012; Aloulou, 2016) is also a focal point for the present study.

The present study aims to ascertain the antecedents of entrepreneurial intentions among Saudi students. The study slant towards the intentions by combining the psychological variables with Ajzen (1985) TPB. The reliability and validity of outcome is ensured by the second generation analytical tool, the Partial Least Square- Structural Equation Modelling (PLS-SEM). The organisation of the study is as follows. Section one present a comprehensive literature review sufficient for setting the theoretical background and a conceptual model stating the hypothesis. The second section provides the insights of methodology, data collection and analysis. And the third section is about the results and discussions, limitations and scope for future research.

2. Review of literature

Predicting human behavior along with its all complexities is the most difficult phenomenon (Ajzen, 1991). It is more cumbersome when the behavior is rare, and hard to observe. However in human psychology, intention is proved to be the best predictor of human behavior (Krueger et al., 2000). Entrepreneurial behavior is also considered as the one of the planned behaviors (Krueger, 2000). Likely other human behaviors entrepreneurial behavior can also be predicted by intentions (Krueger et al., 2000; Lüthje & Franke, 2003). Entrepreneurial Intention (EI) is the stepping stone for a comprehensive and stretched process of starting new ventures (Karimi et al., 2015). Theory of Planned Behavior propounded by Ajzen (1985) is identified as the most pervasive, robust, widely used and coherent approach in predicting the entrepreneurial intent (Engle et al., 2010; Kautonen et al., 2015; Krueger Jr et al., 2000; Liñán & Chen, 2009; Lüthje & Franke, 2003; van Gelderen et al., 2008). TPB postulates that the following three independent and motivational constructs predict EI:

1. Attitude towards behavior (ATD): This refers to the degree to which a person has a favourable or unfavourable evaluation of the behaviour in question (I. Ajzen & Madden, 1986). Attitude according to Ajzen (1991) and Ajzen and Fishbein (2000) is a behavioural belief which has been shown approximately 50 percent of variance in intentions and approximately 30 percent in overall behaviour. Studies like, Schlaegel and Koenig (2014), Schwarz et al. (2009), Gelderen et al. (2008) and Kolvereid (1996) have tested the relevancy of attitude as a significant predictor and found it to be the significant.

2. Subjective norms (SN): This is the perceived social pressure to perform or not to perform a particular behaviour. It is based on two components: a. normative belief and b. motivation to comply with these beliefs (Ajzen & Fishbein, 2000). An individual develops a belief and generate motivation from the family, friends and significant others who will approve or disapprove the decision of becoming an entrepreneur (Linen, 2008). Thus SN can be positive and negative depending upon the positivity and negativity of normative belief and motivation received (Aloulou, 2016; Karimi et al., 2016; Liñán & Chen, 2009). The current study focuses on the positivity of SN towards entrepreneurship. SN is also found to mediate in formation of a positive attitude and the perceived behavioural control (Liñán, 2004; Liñán & Chen, 2009).

3. Perceived behavioral control (PBC): This is the perception of ease or difficulty of performing certain behaviours (Ajzen, 1991). PBC is concerned with the sense of capacity to perform a particular behaviour. It is based on the notion that Individual usually choose to perform behaviours that they think they will be able to control and master (Moriano et al., 2012). It resembles with the Theory of Perceived Self-efficacy (Bandura, 1977; Hao et al., 2005; Moriano et al., 2012). Self-efficacy is considered to be a stronger predictor of EI (Armitage & Conner, 2001). The determinants of PBC or self-efficacy have been vastly investigated by researchers (for instance (Hao et al., 2005; Pihie & Bagheri, 2013; Piperopoulos & Dimov, 2015; Winkler & Case, 2014).

Several researchers have applied TPB on students' samples and confirmed its' predictability in multiple contexts and cultures (Autio et al., 2001; Iakovleva et al., 2011; Krueger et al., 2000; Liñán & Chen, 2006; van Gelderen et al., 2008). These studies concluded that combining the three antecedents explain 30 to 45 percent of the variation in intentions. TPB in Kingdom of Saudi Arabia (KSA) context was tested by Ali (2016), Aloulou (2016), Almobaireek and Manolova (2012) on students samples and observed an overall variation of 40, 33.4 percent in explaining the entrepreneurial intentions (EIs) respectively. Considering all these studies, the following hypothesis are set for the sample of Saudi students.

H1: The three antecedents of TPB; Attitude towards behaviour (ATD), Subjective norms (SN) and Perceived Behavioural Control (PBC) together positively explain the EIs among Saudi Students.

H1a: ATD positively affects the EIs of Saudi Students.

H1b: SN positively affects the EIs of Saudi Students.

H1c: PBC positively affects the EIs of Saudi Students.

H2a: SN positively affects the attitude (ATD) of Saudi Students.

H2b: SN positively affects the Perceived Behavioural Control (PBC) of Saudi Students.

Psychological characteristics and Entrepreneurial Intent:

The role of personality traits or psychological characteristics like risk propensity, locus of control, need for achievements etc., in entrepreneurial behavior and new venture creation is an aspect that can never be overlooked (Zhao & Seibert, 2006). Personality and personal characteristics of entrepreneurs are integral part of the multidimensional model of entrepreneurship (Espiritu-Olmos & Sastre-Castillo, 2015; Zhao & Seibert, 2006).

However, only a weak relationship has been found between psychological characteristics as a direct predictor of EI (Ferreira et al., 2012; Karimi et al., 2015). But when these are combined with the behavioral characteristics like attitude, subjective norms, perceived behavioral control etc.; there was found to be better relationship with entrepreneurial intentions (Altinay et al., 2012; Ferreira et al., 2012; Karimi et al., 2015; Nasip et al., 2017). The fact that meager amount of studies have only regressed the psychological characteristics with TPB constructs, has also proved to be a source of motivation for the current study. A number of studies have examined the relational relationship between psychological characteristics and TPB. A few such studies are reviewed in the following section and presented under various heads like internal locus of control, need for achievement, propensity of taking risk, etc.

1. Internal Locus of Control: Internal Locus of control (ILC) refers to the degree of perception of individuals about the events control. Earlier narratives on internal locus of control and entrepreneurial intent rendered inconsistent and conflicting evidences between internal locus of control and entrepreneurial intention (Ferreira et al., 2012; Gürol & Atsan, 2006; Rauch & Frese, 2007). There are several studies that confirmed that students with higher internal locus of control are high in entrepreneurial behavior, and EI (Gürol & Atsan, 2006; Koh, 1996; Thomas & Mueller, 2001). However, Ferreira et al. (2012), and Dinis et al. (2013) did not observe any significant relationship with EI. Rauch and Frese (2007) found a small effect of internal locus of control on entrepreneurial success, which indicate the presence of moderating and mediating variables. However, when ILC is regressed with attitude it was found to be significant because of its alignment with the definitions. People with high internal locus of control are likely to have more positive attitude towards entrepreneurship (Robinson et al., 1991). Moreover, they were found to be having high belief that they can establish a new venture with ease (Karimi et al., 2015). This notion presents an association between internal locus of control and PBC. Based on these the following hypotheses are framed:

H3a: Internal locus of control (ILC) positively affects the attitude (ATD) of Saudi Students in predicting the entrepreneurial intentions.

H3b: Internal locus of control (ILC) positively affects the perceived behavioural control (PBC) of Saudi Students in predicting the entrepreneurial intentions.

H3c: Internal locus of control (ILC) positively affects the Entrepreneurial Intentions (EIs) of Saudi Students.

2. Need for Achievements: Need for achievements (NFA) was first presented by McClelland (1961). He postulated that individuals with high desire for success would have a high propensity towards a high level of need of achievement. Due to this, such individuals are more likely to become entrepreneurs. An individual, high on need for achievement can thus be expected to have a positive attitude towards entrepreneurship (McClelland, 1987). Further, individual with a higher need for achievement appreciates personal responsibility, prefers solving problems unassisted, likes taking acceptable risks, and has a strong interest in the outcomes of their efforts or decisions (Sesen, 2013). People, high on this aspect relatively are more capable and high in ability to prevail under adverse circumstances (Karimi et al., 2015). Need for Achievement as a significant predictor of entrepreneurial intention has been identified in several studies (Altinay et al., 2012; Ferreira et al., 2012; Gürol & Atsan, 2006; Koh, 1996; Rauch & Frese, 2007). For instance, Rauch and Frese (2007) in their meta-analysis affirm a direct relationship between need for achievement and EI. Based on these, the following Hypothesis are framed:

H4a: Need for Achievements (NFA) positively affects the attitude (ATD) of Saudi students in predicting the entrepreneurial intentions.

H4b: Need for Achievements (NFA) positively affects the Perceived Behavioural Control (PBC) of Saudi students in predicting the entrepreneurial intentions.

H4c: Need for Achievements (NFA) Positively affects the Entrepreneurial Intentions (EIs) of Saudi students.

3. Propensity to Risk: Risk taking or Propensity to take risk (PTR) has been one of the most important constituent of entrepreneurial personality. Many studies have identified propensity to take risk as one of the determinants of EI (Koh, 1996; Rauch & Frese, 2007; Stewart & Roth, 2001). Certain other studies, like Gürol and Atsan (2006), and Dinis et al. (2013) employed propensity to risk as an endogenous variable in EI models. Propensity to take risk is a capacity building characteristic, and provides a positive attitude and contribute towards self-efficacy of individuals (Zhao et al., 2005). Those who will be willing to take high risk will have a positive attitude towards entrepreneurship (Bygrave, 1989; Do Paço et al., 2011). Similarly one with a perception of relatively high difficulty in any event will be more interested to take part in that event. The following hypothesis are formulated based on the available literature:

H5a: Propensity to Risk (PTR) positively affects the attitude (ATD) of Saudi students in predicting the entrepreneurial intentions.

H5b: Propensity to Risk (PTR) positively affects the Perceived Behavioural Control (PBC) of Saudi students in predicting the entrepreneurial intentions.

H5c: Propensity to Risk (PTR) positively affects the Entrepreneurial Intentions (EIs) of Saudi students.

4. Self Confidence: Self-confidence is an individual's belief in his/her personal ability to organize and execute a specific set of tasks (Bygrave, 1989; Koh, 1996). It is an essential entrepreneurial characteristic (Robinson et al., 1991), and is related to other psychological characteristics such as internal locus of control, propensity to take risk and tolerance of ambiguity (Koh, 1996). Studies like Robinson et al. (1991) Dinis et al. (2013), Ferreira et al. (2012) and Nasip et al. (2017) found self-confidence a significant predictor entrepreneurial intentions. The hypotheses drafted for self-confidence are as under:

H6a: Self-Confidence (SC) positively affects the attitude (ATD) of Saudi students in predicting the entrepreneurial intentions.

H6b: Self-Confidence (SC) positively affects the Perceived Behavioural Control (PBC) of Saudi students in predicting the entrepreneurial intentions.

H6c: Self-Confidence (SC) positively affects the Entrepreneurial Intentions (EIs) of Saudi students.

Based on the review of literature, and the hypotheses derived therein, the proposed for the study can be seen in fig.1:

3. Methodology

Senior students (level five and above) of an undergraduate business program of a public university in KSA form the target population for the study. The sampling choice is coherent because of two reasons:

1. Business students are prospective entrepreneurs and most of the studies on EI are based on samples from amongst students e.g. Zhao et al. (2005); Lüthje and Franke (2003); Engle et al. (2010); Chen (2013); Krueger et al. (2000); Autio et al. (2001).

2. KSA is a country where a large proportion of population aged between 15 and 30 years. Young people have more chances to involve in entrepreneurial activities.

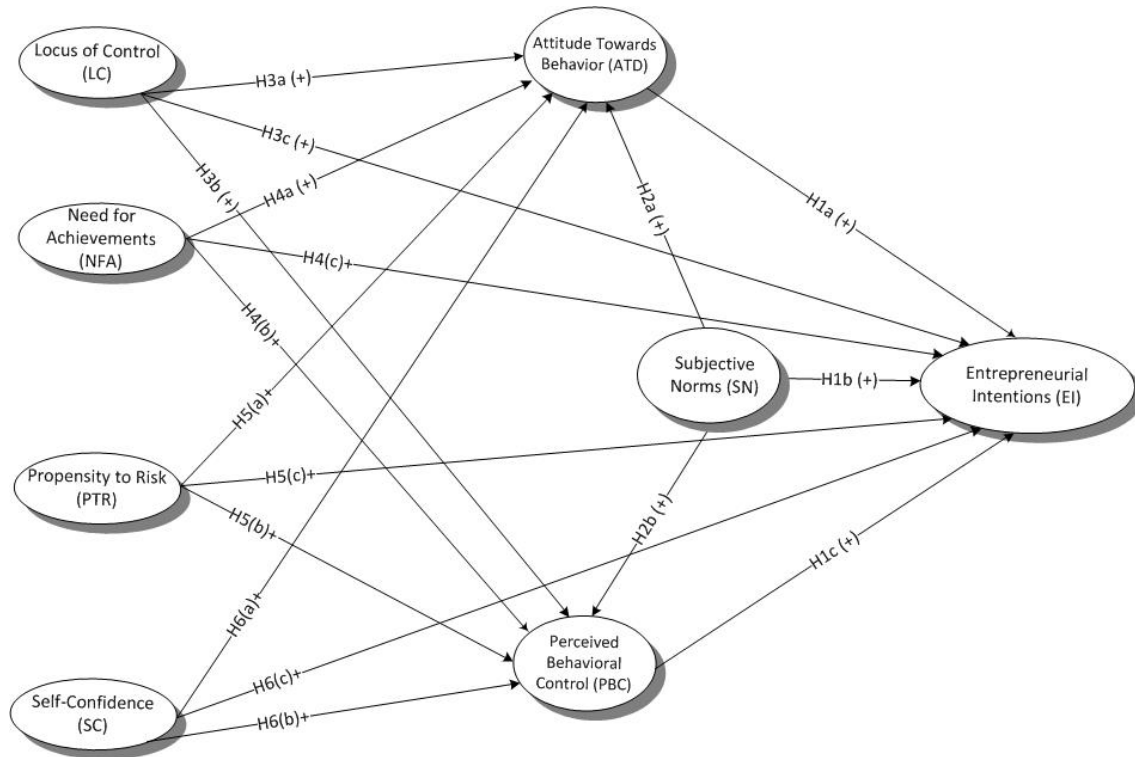


Fig.1. Proposed Model

Data for the study was collocated through a self-administered questionnaire. The questionnaire consisted of three sections. Section one solicited information about the demographic variables, section two consisted items pertained to EI variables (conceived from Linen Liñán and Chen (2009)); and section three was personality related variables (conceived from Koh (1996) and Zhao et al. (2005)). The items adopted from Liñán and Chen (2009) were on a seven point likert scale, while personality related items taken from Koh (1996) and Zhao et al. (2005) were on a 5 point likert scale where higher value indicate “Agree Strongly” and lower value “Disagree Strongly”. A total of 600 questionnaires translated into Arabic language were distributed over a period of four months. 550 questionnaires were received duly filled in, making an overall response rate of 92 per cent. Data screening, cleaning and analysis were conducted with the help of IBM SPSS software. Missing value analysis were performed and values with greater than five per cent ($n > 5\%$) were eradicated, and rest were replaced with a series median. The seven point likert scale items were downscaled to five point to resemble the whole data. The outliers were detected are removed. Subsequent to the above processes the data set consisted of 315, which were ideal for Partial Least Square (PLS) or path coefficient analysis. Data sufficiency for path coefficient analysis was verified, and it was found to be sufficient by GPower software (Ringle et al., 2014). SmartPLS software was used for path coefficient analysis. The Table below presents the characteristics of the sample used in the study.

Table 1. Sample Characteristics

Data Type	Questionnaire administered data
Population	Level 5 and above Business Undergraduate Students
Sample Size	550
Response Rate	92 percent
Final Data for Analysis	315
Male Respondents	243
Female Respondents	72

Source: Research's compilation

4. Results and Discussions:

Descriptive Analysis

The descriptive statistics are presented in Table 2. The results suggest that students are inclined towards the entrepreneurial behavior, with higher mean for EI (M= 4.416, SD=0.837). In contrary to EI, Self Confidence has the lowest mean (M=3.148, SD=0.560) indicating that students are not confident enough to be an entrepreneur. One more interesting fact that emerges from the descriptive statistics is that the EI and its antecedents has higher mean with low variance relatively to the personality variables of entrepreneur (see table-2).

Table 2. Descriptive Statistics of Summated Scales

	Min	Max	Range	Mean	Mdn	SD	Kurtosis	Skewness
EI	1.000	5.000	4.000	4.416	4.750	0.837	3.160	-1.802
ATD	1.400	5.000	3.600	4.371	4.600	0.711	2.297	-1.519
SN	1.000	5.000	4.000	3.923	4.000	0.914	-0.020	-0.714
PBC	1.000	5.000	4.000	3.788	4.000	1.035	-0.218	-0.769
LC	1.429	5.000	3.571	3.515	3.429	0.605	0.521	0.202
NFA	2.000	4.333	2.333	3.403	3.333	0.465	-0.253	-0.043
PTR	1.833	4.833	3.000	3.391	3.333	0.496	0.096	0.137
SC	1.833	5.000	3.167	3.148	3.000	0.560	0.114	0.432

Source: Research's compilation

The Measurement Model

The measuring model evaluation or outer model assessment is based on the confirmation of three important measurements namely, convergent validity, internal consistency reliability and discriminant validity (Ringle et al., 2014). The convergent validities are obtained by the observations of the Average Variance Extracted (AVEs). According to (Henseler et al., 2009) the AVEs values for all measurements should exceed the threshold limit of 0.50. Those having values below 0.50 were dropped from the measurement model. Figure 2 presents the measurement model of the present study in SmartPLS. The values of AVEs greater are than 0.50. Thus the model can be considered to have convergent validities.

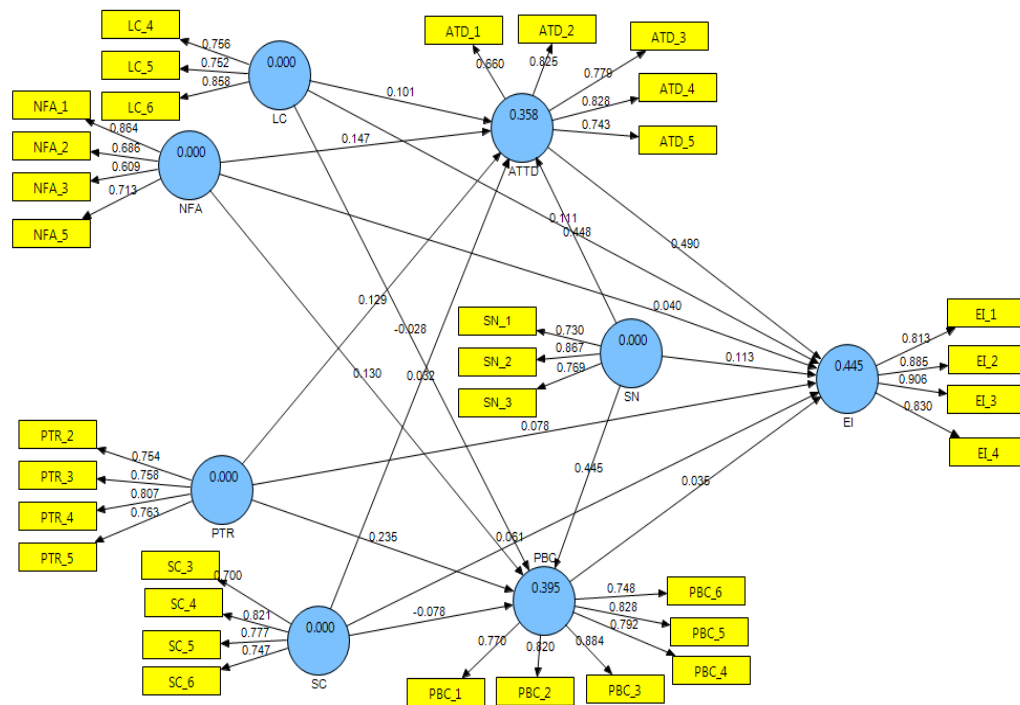


Fig.2. Measurement Model

Source: Research's compilation

The internal consistency values predicted by the Croanbach's Alpha (CA) and Composite Reliability (CR) are used to evaluate the un-biasness of the samples, or reliability of the answers in the groups. In the given cases, the CA values for various cases range from 0.70 to 0.89 (Table-3), which fits into the threshold limit of Cronbach's Alpha (CA > 0.7). The CR values above 0.70 are considered satisfactory, as proposed by (Hair et al., 2010). The composite reliabilities of different measures were found to range from 0.81 to 0.92, which satisfactorily meets the threshold. Table 3 thus demonstrates that the CA and CR values are adequate.

Table 3. Descriptive Statistics of Summated Scales

	Composite Reliability	R Square	Cronbach's Alpha
ATTD	0.878	0.358	0.825
EI	0.919	0.417	0.881
LC	0.833	0.000	0.704
NFA	0.812	0.000	0.693
PBC	0.919	0.396	0.893
PTR	0.854	0.000	0.774
SC	0.848	0.000	0.769
SN	0.833	0.000	0.699

Source: Research's compilation

Table 4 and 5 reports the results of discriminant validity of the measure scale. The results indicate that the constructs are the independent from one another (Hair et al., 2016). Table 4 demonstrates that the square root of AVEs for all the latent variables (values in the matrix diagonals). It can be seen that all the values are greater than the inter-constructs correlations. Thus it can be construed that the results supports the discriminant validity of the scales as proposed by Fornell and Larcker (1981). The extracted factors and cross loadings of all indicator items to their concerned latent construct are presented in Table 5. These results indicate that all items loaded on their respective construct from a lower bound of 0.70 to an upper bound of 0.90 on their respective construct than on any other. This provides an additional support to confirm the discriminant validity.

Table 4. Inter-correlations of Variable Construct as per Fornell and Larcker (1981) Criterion

	ATTD	EI	LC	NFA	PBC	PTR	SC	SN
ATTD	0.770							
EI	0.635	0.859						
LC	0.320	0.345	0.790					
NFA	0.370	0.341	0.527	0.723				
PBC	0.558	0.425	0.243	0.368	0.808			
PTR	0.324	0.322	0.444	0.486	0.399	0.771		
SC	-0.158	-0.102	-0.145	-0.258	-0.279	-0.316	0.764	
SN	0.525	0.423	0.195	0.260	0.537	0.198	-0.219	0.791

Source: Research's compilation

Table 5. Outer Model Loadings and Cross Loadings

	ATTD	EI	LC	NFA	PBC	PTR	SC	SN
ATD_1	0.660	0.390	0.211	0.293	0.414	0.262	-0.184	0.419
ATD_2	0.825	0.542	0.264	0.322	0.485	0.289	-0.160	0.404
ATD_3	0.779	0.508	0.256	0.308	0.358	0.208	-0.043	0.368
ATD_4	0.828	0.517	0.228	0.239	0.469	0.252	-0.140	0.408
ATD_5	0.743	0.473	0.268	0.259	0.419	0.233	-0.081	0.421
EI_1	0.527	0.811	0.304	0.249	0.290	0.268	-0.065	0.312
EI_2	0.581	0.886	0.303	0.273	0.329	0.266	-0.076	0.335
EI_3	0.550	0.906	0.303	0.310	0.423	0.294	-0.094	0.409
EI_4	0.523	0.830	0.274	0.341	0.418	0.278	-0.115	0.394
LC_4	0.187	0.238	0.748	0.430	0.176	0.433	-0.099	0.096
LC_5	0.258	0.220	0.763	0.362	0.137	0.277	-0.106	0.162
LC_6	0.298	0.340	0.855	0.457	0.249	0.360	-0.134	0.190
NFA_1	0.340	0.341	0.506	0.857	0.332	0.423	-0.205	0.245
NFA_2	0.263	0.184	0.355	0.710	0.297	0.365	-0.294	0.183
NFA_3	0.171	0.174	0.202	0.615	0.254	0.303	-0.220	0.181
NFA_5	0.272	0.271	0.427	0.689	0.153	0.295	0.005	0.124
PBC_1	0.425	0.271	0.195	0.312	0.770	0.339	-0.233	0.459
PBC_2	0.477	0.332	0.181	0.296	0.820	0.296	-0.142	0.452
PBC_3	0.479	0.329	0.200	0.306	0.884	0.328	-0.235	0.487
PBC_4	0.335	0.265	0.166	0.263	0.793	0.260	-0.275	0.405
PBC_5	0.417	0.353	0.184	0.284	0.828	0.317	-0.267	0.383
PBC_6	0.541	0.481	0.243	0.314	0.747	0.375	-0.204	0.408

PTR_2	0.270	0.255	0.341	0.431	0.344	0.759	-0.278	0.174
PTR_3	0.196	0.212	0.249	0.340	0.256	0.756	-0.274	0.050
PTR_4	0.279	0.259	0.387	0.358	0.342	0.810	-0.192	0.181
PTR_5	0.237	0.261	0.377	0.361	0.270	0.756	-0.240	0.182
SC_3	-0.049	-0.042	-0.052	-0.190	-0.152	-0.150	0.705	-0.111
SC_4	-0.103	-0.059	-0.066	-0.141	-0.205	-0.185	0.825	-0.197
SC_5	-0.093	-0.055	-0.068	-0.118	-0.223	-0.214	0.783	-0.199
SC_6	-0.191	-0.128	-0.209	-0.306	-0.242	-0.355	0.738	-0.150
SN_1	0.413	0.291	0.205	0.200	0.339	0.121	-0.098	0.730
SN_2	0.501	0.429	0.147	0.228	0.457	0.216	-0.167	0.867
SN_3	0.310	0.260	0.118	0.184	0.476	0.115	-0.259	0.769

Source: Research's compilation

Structural Model Assessment

Once the reliability and validity of latent variables are established in a structural model, the next step is the assessment of structural or inner model. To run the final model bootstrapping technique has been used on 315 data points with 5,000 valid sub-samples. The results of initial bootstrapping are given in Table 6. The paths LC -> ATTD, LC -> PBC, NFA -> EI, PBC -> EI, PTR -> EI, SC -> ATTD and SC ->EI are found to be not significant ($p > .10$), and subsequently excluded from the original model. Upon exclusions the remaining significant paths are maintained, where level of significance is considered on different levels ($p \leq 0.01$, $p \leq 0.05$ and $p \leq 0.10$). The Final bootstrapping results are reported in Table 7.

Table 6. Initial Bootstrapping Results

	Original Sample	Sample Mean	SD	SE	t
ATTD -> EI	0.490	0.493	0.069	0.069	7.118***
LC -> ATTD	0.101	0.106	0.065	0.065	1.539ns
LC -> EI	0.112	0.112	0.051	0.051	2.194**
LC -> PBC	-0.028	-0.026	0.059	0.059	0.469ns
NFA -> ATTD	0.147	0.147	0.067	0.067	2.198**
NFA -> EI	0.040	0.039	0.072	0.072	0.555ns
NFA -> PBC	0.131	0.131	0.061	0.061	2.130**
PBC -> EI	0.035	0.035	0.055	0.055	0.646ns
PTR -> ATTD	0.129	0.127	0.060	0.060	2.151**
PTR -> EI	0.078	0.075	0.051	0.051	1.528ns
PTR -> PBC	0.235	0.232	0.061	0.061	3.877***
SC -> ATTD	0.032	0.027	0.047	0.047	0.680ns
SC -> EI	0.061	0.058	0.044	0.044	1.395ns
SC -> PBC	-0.078	-0.084	0.043	0.043	1.831*
SN -> ATTD	0.448	0.446	0.057	0.057	7.834***
SN -> EI	0.113	0.114	0.052	0.052	2.155**
SN -> PBC	0.445	0.445	0.049	0.049	9.006***
Notes: n=315. Significant at ***0.01 level ($p < 0.01$), **0.05 level ($p < 0.05$) and *0.10 level. ns= not significant.					

Table 7. Final bootstrapping results

	Original Sample	Sample Mean	SD	SE	t
ATTD -> EI	0.524	0.526	0.065	0.065	8.090***
LC -> EI	0.157	0.159	0.046	0.046	3.397***
NFA -> ATTD	0.182	0.186	0.066	0.066	2.762***
NFA -> PBC	0.123	0.125	0.056	0.056	2.182**
PTR -> ATTD	0.147	0.148	0.058	0.058	2.532**
PTR -> PBC	0.225	0.225	0.057	0.057	3.930***
SC -> PBC	-0.078	-0.085	0.042	0.042	1.885*
SN -> ATTD	0.448	0.446	0.058	0.058	7.757***
SN -> EI	0.117	0.118	0.048	0.048	2.469**
SN -> PBC	0.444	0.443	0.050	0.050	8.966***
Notes: n=315. Significant at ***0.01 level (p< 0.01), **0.05 level (p<0.05) and *0.10 level.					

Source: Research's compilation

The relationship between the constructs and the coefficients obtained from structural model will be considered as robust if coefficients are bigger than 0.2 (Chin, 1998). Notably, the total effects of an independent variable over the dependent variable are always bigger because of interacting indirect effect. The direct, indirect and total effects are reported in Table 8. Only two constructs namely, SN and NFA had indirect effect on EI of the population in the study. As per the criteria of Chin (1998), attitude and subjective norms has robust effects on EI ($\beta > 0.2$). Among the psychological variables, only Locus of control and need for achievement has direct medium and indirect small effects on EI. Among psychological variables only propensity to risk has the big effect on PBC. Other variables have medium and small effects on attitude and perceived behavioural control. More importantly SN has a robust effect on the other antecedents of PTB (Table 8).

Table 8. Direct and Indirect effect Table

	Direct effect	Indirect effect	Total effect
ATTD -> EI	0.524	-	0.524
LC -> EI	0.157	-	0.157
NFA -> ATTD	0.182	-	0.182
NFA -> EI	Ns	0.072	0.072
NFA -> PBC	0.131	-	0.131
PTR -> EI	Ns	0.068	0.068
PTR -> ATTD	0.129	-	0.129
PTR -> PBC	0.235	-	0.235
SC -> PBC	-0.078	-	-0.078
SN -> ATTD	0.448	-	0.448
SN -> EI	0.113	0.220	0.332
SN -> PBC	0.445	-	0.445

Source: Research's compilation

The Assessment of the structural model is incomplete without discussing the goodness of fit (GOF) statistics. The model discussed explains overall variation of 43.6 percent based on SN, ATR and PBC. The significance of structural coefficients and the size of effects provide the guidelines for research hypothesis results. The results of hypothesis can be presented as follows:

- H1a:** ATTD -> EI
- H1b:** SN -> EI
- H1c:** PBC -> EI
- H2a:** SN -> ATTD
- H2b:** SN -> PBC
- H3a:** LC -> ATTD
- H3b:** LC -> PBC
- H3c:** LC -> EI
- H4a:** NFA -> ATTD
- H4b:** NFA -> PBC
- H4c:** NFA -> EI
- H5a:** PTR -> ATTD
- H5b:** PTR -> PBC
- H5c:** PTR -> EI
- H6a:** SC -> ATTD
- H6b:** SC -> PBC
- H6c:** SC -> EI

Figure 3 presents the final model, with the effects and explained variances in the endogenous constructs.

Discussions

The study confirms the congruence of psychological characteristics with TPB and its' antecedents. Moreover it also affirms the applicability, generalizability and acceptance of TPB as a predictor of entrepreneurial intentions by extending it to one more country and culture. This has been confirmed with the help of a second generation quantitative tool.

The results revealed significant relationships between EI and its three motivational constructs. When taken together it explains the notably high per cent (43.6 per cent) of variation than other studies in the Saudi context (Ali, 2016; Almobaireek & Manolova, 2012; Aloulou, 2016). In the present study attitude and SN are identified as the significant predictors of EI which indicate that students have a positive approach towards the entrepreneurship and are more likely to take inspiration from peers, friends, relatives, teachers and in total from society to become the entrepreneur in future. Thus social pressures also act like a trigger to the students for becoming future entrepreneurs (Morianio et al., 2012). The results of the study indicate attitude towards entrepreneurship as the strongest predictor of EI are in line with the other studies (Liñán & Chen, 2009; Nabi et al., 2011; Schlaegel & Koenig, 2014) conducted in different culture and context. Moreover the findings in the present study do not cite any significant relationship between PBC and EI. This seems to be in contrast to the findings of other studies, e.g. Liñán and Chen (2009), Engle et al. (2010), Iakovleva et al. (2011). However the results are not tend to be totally different studies like, Do Paço et al. (2011), Ferreira et al. (2012), Engle et al. (2010) found significantly minimal or no influence of PBC on EI. The other studies were conducted in the developed countries which conclude that people seems to be more certain about their success and their work (Karimi et al., 2015).

Out of four personality factors, considered for the present study, only two namely NFA and PTR relates to the attitude. It indicates that need for achievement contribute to form a positive attitude which leads to the intention to be involved in entrepreneurial behavior. PTR specify that the students are having a high propensity of positive

attitude towards the risk which signify that they are willing to take risk. On the other hand, the NFA to PBC is in a same line of NFA to attitude, which indicates that high NFA could be translated into a perception of perceived easiness to start an enterprise. Further, more risk taking propensity will make it easier for them to start the business in future. The results provide a strong support to the earlier thoughts that emphasize that personality factors should be indeed incorporated into social-cognitive models of intentions and behavior (Ferreira et al., 2012; Karimi et al., 2015; Lüthje & Franke, 2003). The results of the study are also in line with those showing the effects of psychological variables on EI (Dinis et al., 2013; Do Paço et al., 2011; Gürol & Atsan, 2006; Koh, 1996; Nasip et al., 2017; Rauch & Frese, 2007; Sesen, 2013) etc. The Study has several practical and policy implications. Based on the findings of the present study the educational and Training programs must be designed to develop, nurture and enhance the personality and behavioral antecedents of students emerged from the current study.

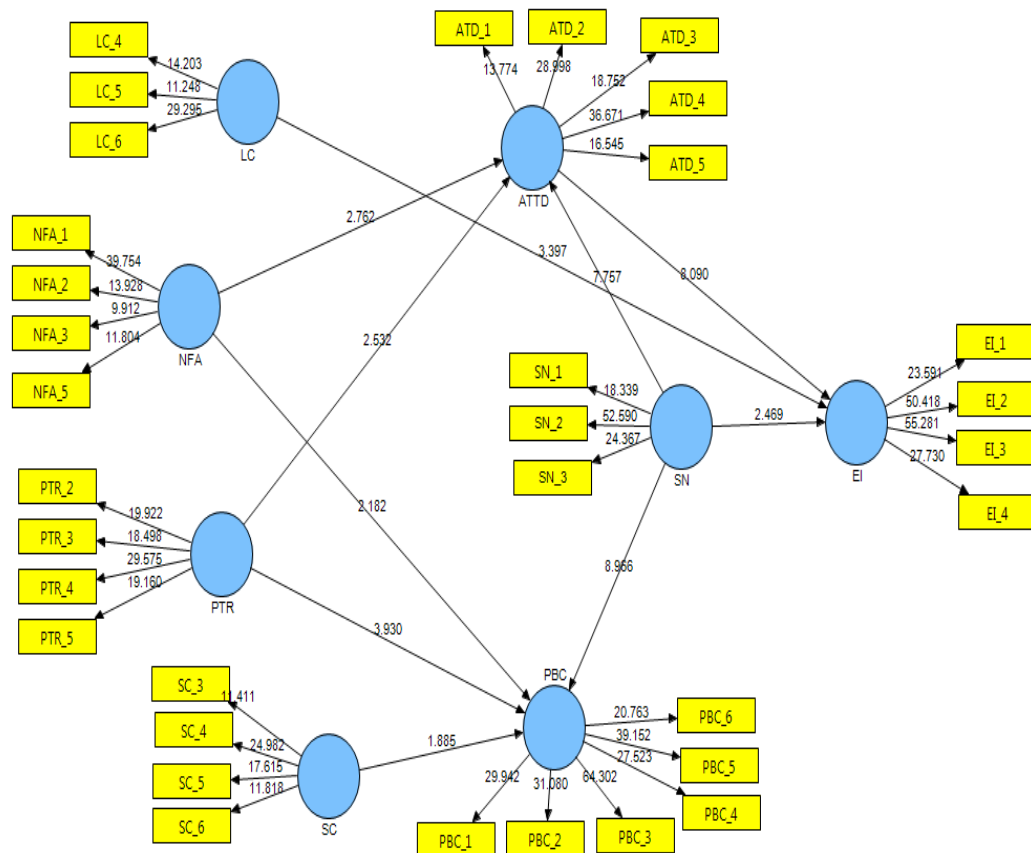


Fig.3. Final model

Source: Research's compilation

The study add one more argument to the literature that only personality factors are also equally important in identifying the intentions of students. Notably, the study was conducted on a sample that did not received any entrepreneurial training program. Therefore the new and introductory programs must focus on individual variables to develop further like subjective norm can be improved by means of developing an ecosystem which conjoint the networks of entrepreneurs at the regional and national level. At the institutional level opportunities

must be developed for networking with entrepreneurs, students entrepreneurial clubs, guest lectures from renowned entrepreneurs, case study dissemination etc. Similarly a positive attitude towards entrepreneurship must be molded in the educational institutions. In this way the “VISION 2030” of KSA will be considered as a game changing initiative but the transformation of vision into action require a thorough thinking and work from the side of academicians and researchers.

5. Conclusion, Suggestions, Limitations and Future Scope for the Study

The present study aimed to investigate the antecedents of entrepreneurial intents of Saudi undergraduate business students by incorporating the personality characteristics (Internal Locus of Control (ILC), Self Confidence (SC), Need for Achievement (NFA) and Propensity to take risk (PTR)) into the TPB. A model (by combining the behavioral and psychological variables) was prepared and tested in this study through PLS (SEM). The Study explored whether and if so, the extent to which these distal factors relate to the motivational factors of EI of students in Saudi Arabian context. The Motivation for the study emerges from the fact that the Behavioral factors are relatively less stable than personality traits and can be changed both across time and situations in virtue of the individual's interaction with the environment (Robinson et al., 1991). The study finds that subjective norm and attitude are the significant predictors of EI among the students in KSA. On the other hand perceived behavioral control did not show any impact over the intentions. Among the personality antecedents only internal locus of control has a direct impact over the intention. The other personality related constructs namely NFA and PTR relates to the attitude and perceived behavioral control.

There are certain limitations to the study. The data collected for the study is a cross sectional data, a longitudinal data is preferred more to draw the firm conclusions. Moreover the data has been collected from a sample of undergraduate business students of a public university in KSA, which suffer from the insufficiency of the samples to make the findings generally applicable.

Some possible directions for future research may be highlighted. The replication of the study using the methodological aspects in other public and private universities of KSA will generate more generalized results. The theoretical model used in the study can be tested and replicated in other context and culture.

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MODEL BASED ON QUALITATIVE CRITERIA FOR INTERNET MARKETING DEVELOPMENT

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Abstract. Purpose of this paper is to propose a model for assessment of internet marketing efficacy, based on qualitative criteria and building on the theoretical and empirical investigation of various qualitative criteria applicable to internet marketing. The methodological framework used in the investigation is based on theoretical descriptive, comparative, analytical methods. Qualitative empirical study based on expert interviews was also employed. Nine experts of internet marketing and related fields were involved in the study. The aim of qualitative study is to explore the expert opinions on the qualitative criteria for internet marketing assessment. This feedback helps to identify problems faced by business developing internet marketing campaigns, the steps to be taken further to solve them and advance campaign efficacy. The model integrating the qualitative criteria into the internet marketing assessment is proposed. The paper analyses the creation and application of qualitative criteria of internet marketing, discusses the problems of internet marketing development, proposes the ways how to deal with the emerging problems and presents the qualitative criteria based model for internet marketing assessment. The qualitative study is the main novelty of the research and is intended to scrutinise the concept of internet marketing quality and distinguish the qualitative criteria for internet marketing development. The conclusions and recommendations of the research have practical value, which will help in the process of internet marketing quality implementation.

Keywords: internet marketing, qualitative criteria of internet marketing, qualitative study.

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1. Introduction

XXI century is regarded as the most important global information technology revolution in the world. Modern people live in the world of technologies that are rapidly improving and expanding into different areas. This phenomenon leads to the growing needs of people and competition. Constantly changing environment of new business models, organizational forms, and the migration of business into the electronic environment is nothing strange, it becomes mandatory part of everyday life.

The Internet and other digital media tools have transformed marketing. Smart growth have contributed to expansion of service sector (Tvaronavičienė, 2017). The customers have much broader choice of goods and services, they can choose between wide number of suppliers and prices. New internet marketing opportunities provide new challenges to organizations too. They might to expand, provide new services; in short, organizations have great opportunities to win competitive advantages (Chaffey et al., 2009). Revolution of internet marketing creates a necessity to a radical rethinking of marketing practice (Balmer, Yen, 2017).

Scientific issue - after the Internet transformed marketing, the business opportunities are increasing and internet marketing for business becomes one of the most important tools to reach competitive advantage. In order to reach it there is a need to determine the qualitative criteria of internet marketing that influence business and consumers. Thus, the problem is that the concept of internet marketing quality and the qualitative criteria are not determined by scientific literature as well as the practice, which makes difficulty to determine the effectiveness of internet marketing.

The **goal of the research** is to propose a model for assessment of internet marketing efficacy, based on qualitative criteria and building on the theoretical and empirical investigation of various qualitative criteria applicable to internet marketing.

The goal will be achieved through the following set of **tasks**:

1. To analyse theoretical aspects of internet marketing qualitative criteria.
2. To perform the qualitative study based on expert interviews regarding consumers' and business' approach of emerging qualitative criteria for internet marketing.
3. Based on theoretical part and qualitative study results, to design the internet marketing qualitative criteria based model.

Methodology – the paper relies on scientific literature analysis, the qualitative research method and the method of dynamic modeling are applied as well. The work carried out theoretical narrative, systematic, comparative analysis. A qualitative expert opinion survey was carried out interviewing e-marketing experts. The experts' opinion was sought to analyze by a standardized interview or questionnaire form. After analysis there was created a model.

The Internet provides tremendous opportunities to reduce the cost of information distribution to global audience. Internet marketing is a key element of developing successful electronic business marketing strategies for large and small companies. Internet marketing allows Lithuania and any other countrys' businesses to compete in international markets, saving money for traditional advertising. Moreover, internet marketing is orientated to individuals and the target users according to their hobbies or activities (Išoraitė, 2013). New tendencies are based on data-driven marketing communications and customer management (Deighton, 2017). Internet marketing

adoption in emerging industrial markets are based on internet technologies such as social media platforms, static and transactional websites (Shaltoni, 2017). Social networks becomes especially important in in B2B and B2C Communication (Davidavičienė et al., 2017; Davidavičienė, Davidavičius, 2014).

Moving the business to e. environment is one of the steps, but in order to become a successful business it has to attract the costumers and within a website to build strong and good relationship with consumer (Fisher et al., 2003), it must have one of the most important tools – strong marketing team. One of the most important internal barriers impacting internationalization of SMEs is limited management skills, communication issues and lack of marketing knowledge (Tvaronavičienė, Korsakienė, 2012). XXI century has become a very significant to marketing professionals. Collision with a number of innovations, challenges and opportunities caused by traditional marketing to the electronic transition. In the literature, this marketing direction is also called internet marketing, web – marketing, hyper - marketing.

2. The concept and evaluation of internet marketing

The concept of marketing is widespread in the world. On the one hand it has a significant value in terms of successful organizations' life. On the other hand in recent decade business strategy has changed and in order to satisfy more customers' needs it has moved to e. business. As a result, marketing has also moved from traditional to internet marketing. Although the concept of internet marketing is analysed much, but still there is no concept of internet marketing quality and qualitative criteria of internet marketing determination. Overall, there is a wide choice of internet marketing concepts such as (Juozapavičiūtė, 2015):

- To the advertising industry it is about Internet advertising and its impact on driving Web traffic and brand building (Breakenridge, 2001).
- The application of the Internet and related digital technologies conjunction with traditional communications to achieve marketing objectives (Chaffey et al., 2009).
- Internet marketing is linked to as the marketing (generally promotion) of products and services over the Internet (Chaffey, 2014).

However, a core, unifying concept of internet marketing has not emerged.

Internet marketing is becoming one of the most effective way to satisfy growing consumers' expectations and to develop business. There are many forms of internet marketing, which enables companies to attract more users and affect their opinion. The functions of internet marketing are as follows (Išoraitė, 2013):

- Improvement of a company image;
- Increase of audience volume;
- Possibility to choose the audience;
- An interactive relationship with costumers;
- Effective trade;
- Marketing dynamics.

In order marketing objectives would be achieved, managers and academics apply Jeromy McCarthy's marketing mix called 4 Ps marketing mix. 4 Ps marketing mix is a combination of many factors which can be measured to meet the market needs and to simplify managerial activities (Kalyanam, McIntyre, 2002). According to McCarthy's 4 Ps marketing mix consist of: product, price, place and promotion. Every Ps cover a number of twelve managerial policies which are described by Borden in the early 1964, but adopted in marketing strategy till nowadays.

In terms of twelve managerial policies, Borden (1964) explains that it is important to create: 1) a list of the important elements or ingredients that make up marketing programs; 2) a list of the forces that bear on the marketing operation of a firm and to which the marketing manager must adjust in his search for a mix or program that can be successful.

The 4 Ps marketing mix was proposed for traditional marketing. Since the business environment has changed, two different approaches - the revisionists' and the conservatives' views originated. The conservatives claim that 4 Ps model might be adopted to new context of marketing (Möller, 2006). Contrary to conservatives, the revisionists state that 4 Ps marketing mix model is internally oriented and Schultz (2001) claims that today's market place needs externally oriented model. Internet marketing strategy must be customer oriented and pay strong attention to the relationship with the customer, which is not according to internally oriented model (Propovic, 2006; Möller, 2006). A common view of all revisionists is that the most important focus must go to customer orientation and according to this view the 4 Ps marketing mix model is applied.

Authors offered some corrections to 4 Ps marketing mix. For instance, Lawrence et al. (2000) offered to add two more Ps: *people and packaging*; and include this mix to the concept of 5 Ps marketing model, which includes *paradox, perspective, paradigm, persuasion and passion*. Prandelli and Verona (2006) proposed 3 Cs model: *content* (website and platform), *community* (interaction platform and relational capability) and *commerce* (including the 4 Ps: product, price, place and promotion). Even more 4 Ps were proposed to add (*Precision, Payment system, Personalization, Push and Pull*) to already existing 4 Ps marketing mix. Dominici (2009) describes additional 4 Ps in the 8 Ps' model (Juozapavičiūtė, 2015):

- Database management systems provide the opportunity to increase accuracy of target segments determination and market positioning in digital context;
- Security and friendly-user environment – the components that must be ensured in payment systems;
- Personalization supports the adaption and determination to customers' needs and expectations;
- Push and Pull regards the choice of trade-off among active communication policies (push) and communication on users' demand (pull).

In summary, internet marketing is a rapidly growing area and has many benefits to customers and organizations. Customers might find easily and fast the product or service they need on the Internet and the business has the opportunity to attract more target groups and to maintain close relationship with already existing clients. However, the needs and expectations of customers growing every day, they want to buy fast, easily, anytime, anywhere. Thus, it is a challenge for companies to determine efficient internet marketing strategy and to apply it in the practice.

3. Qualitative criteria of internet marketing development

Neither internet marketing quality nor qualitative criteria of internet marketing are defined in the literature. The novelty of internet marketing forcing the professionals of this area to look for new opportunities and to meet current and future customers' needs and expectations, which are often related intangible features such as trade mark, its' image and design, interaction with company's image and reputation (Limba, Jurkutė, 2013).

Forbes (2012) announce that any business must admit the power of a great design for customers' experience. Design-oriented business has the advantage, because the first thing what customer pays attention to – is an image, design of graphic, brand, product, interior, web and service design. For instance, the customer knows quickly if he likes the design or not, if the Web site is good or bad. Design-oriented companies put design at the heart of their

company to build innovation and to constantly improve products, service and marketing trends. They recognize that a great design guarantees the differentiation, customer loyalty and higher profits (Swann, 2012).

Internet market orientation covers generation of information: collecting customers' information, development of customers' databases and responding to customers' demand. Since the Internet has changed the customers' behaviour, business had to adapt to the changes and focus on individualized and convenient services such as search function development in order to preserve the customers' loyalty and to stay competitive (Srini et al., 2002). Besides, the authors claim that Internet users assess the convenience and design of the website. Moreover, Lee and Kozar (2006) submit that companies which invest to flexibility of its' website can achieve corporate financial and performance of the website. The website must recognise the features of customers in order to make the enjoyable browsing on the website. Website design has important and positive influence to customers' satisfaction (Szymanski, Hise, 2000). Internet marketing is inseparable process, which helps to determine the target groups and provide information about products and services through the Internet to increase the sales.

Some authors emphasize importance of information quality, but include system and service quality as well (Sun, 2010). Based on Wixom and Todd's (2005) prepared model of technology use, the 3Q model was proposed, which includes three main aspects of information quality, system quality and service quality. The model separates the beliefs and attitudes about the system from the beliefs and attitudes about the using system. The model interprets that system quality explains the structural attributes of e. commerce system: availability, adaptability, response time. Information quality captures the content, which includes factors such as completeness, accuracy, format, currency. Step back to qualitative criteria of design, the literature of website quality says that system and information quality are important elements in the perception of website quality (Liu, Arnett, 2000).

Customer satisfaction is an important element in marketing practice and most companies admit that customer satisfaction is necessary "strategic imperative" (Mittal et al., 2010). On the one hand Hauman et al. (2014) confirm that customer satisfaction has a positive influence for customer loyalty and customer willingness to pay. On the other hand, customer satisfaction affects customers for a short time period because business operates in a very competitive environment. Because of that, companies must build long-term relationship with customers and pay attention to customer-company identification, which is described as the feeling of belongingness to an organization. The customer-company identification positively affects customers' in-role and extra-role behaviours, loyalty and willingness to pay (spending). Moreover, the customer-company identification is an active, selective and volitional psychological process in which customer selects the company by its' own desire, the competitors meet the problem to attract identified customers (Sen, 2003).

The topic of loyalty has been widely analysed for decades. E-loyalty is the continuation of the traditional loyalty to e. commerce. E-loyalty is the customers' loyalty to electronic retailer (Turban et al., 2002). From this view of point, there is no important difference between customer loyalty and customer e-loyalty. Xiaojuan, Ling Sia (2003) connected four factors, which are described as four staged perceptual elements, which form the customers' loyalty: confirmation of expectations, satisfaction, trust, sense of belonging. The authors combined the e-loyalty wheel of those four factors. Gong, Nam (2016) defines creative customers behaviors as positive outcomes for organizations because such behaviors lead to the improvement in customer satisfaction and loyalty. Companies' social responsibility can also increase customers' loyalty (Eteokleous et al., 2016; Hadjikhani et al., 2016).

Expectation is the first step when customer is in the process of decision making to purchase or not. The Internet provides more convenient to customers – they can easily reach the vendors' information about brand, reputation, and product or service evaluation. The Internet provides wide option opportunities for customers so their expectations are increasing more and more. In order to satisfy costumers' expectations companies need to

improve their offerings. However, it is important to mention that companies must promise only as much as they really can implement, otherwise customers will get the dissatisfaction. In terms of online transactions, satisfaction is measured according to customers' behaviour on the website. The customer stays longer on the website and search for information. As a result, the chance of repeated buying is growing (Juozapavičiūtė, 2015).

Trust is an important element in e-loyalty wheel (Gefen, 2002). When the customers are satisfied about online purchase, the products or services, they are more willing to trust the vendor later (Davidavičienė, Sabaitytė, 2014). The chance of sharing the information with the vendor, the decision of using the service again and accepting further offers of the vendor is increasing. Sense of belonging is the continuation of trust. This emotional connection is treated as high solidarity. If the customer comes to this stage, the possibility of re-purchase is increasing much more and the loyalty is formed exactly in the stage of sense of belonging. Moreover, if the vendor builds the online community, the customers will be more willing to attend it and makes them feel committed to online vendor. The positive feedback from the online communities will increase the chance of re-purchasing; moreover, the members will be less afraid of sharing the personal information with the vendor. Getting the personal information is very important to the company, because it is the best way to build an effective loyalty programs and maintain the relationship with customer (Xiaojuan, Ling Sia, 2003).

Haumann et al. (2014) also highlight the importance of effectiveness of loyalty programs. They state that competitive actions such as competitive advertising influence the success of loyalty programs to maintain customer loyalty over time. Carrington, Neville (2016) state, that customers play very important role in producing goods, so their loyalty is even more important.

To sum up different aspects, which influence the success of internet marketing, are analysed: brand, website design, level of reputation, accessible, accuracy, flexible information, secure information and data protection, customer satisfaction, expectations, trust, loyalty. In order to abridge the aspects, the four main criteria have been determined: design, information distribution channels, customer satisfaction and customers' e-loyalty.

4. Investigation of Qualitative Criteria for Internet Marketing Development

Research methodology. The qualitative research method was chosen - experts opinion survey by structured interview or questionnaire form. This method was chosen in order to dig deeper into the problem, while the quantitative research is focused on the extent and spread of the phenomenon (Baley, 1995). Qualitative research allows obtaining various information, broadening the issue and analysing it in a broader context. Interview is considered as one of the most effective qualitative research methods, which provides detailed answers, especially to open questions (Tidikis, 2003). Of all the types of interviews the expert interview was selected. The interview was carried out according to pre-formulated questions and respondents were asked by the same procedure.

The questionnaire was made in accordance with the principles of drawing up the questionnaire. The objective of the research was introduced; respondents were familiar with the issue of the research. Moreover, it was noted that the questionnaire is aimed to find the experts' insights about qualitative criteria of internet marketing determination and application. The answers are submitted as the personal opinion and evaluation. The questionnaire indicates major explanations and instructions on how to fill in a certain part of the questionnaire.

The problem of a sample size in quantitative research has been analysed sufficiently. However it is hard to determine what sample size should be held in qualitative research. The sample size depends on phenomenon details of the research, strategy of the research, informativeness of collected data and method of data collection. Applying interview, the proposed sample size is from five to thirty people, in this case nine respondents have been chosen. Qualitative research findings are more closely related to the investigators' analytical capacity and

testing of selected cases informativeness, than the sample size of the problem (Bitinas et al., 2008). As a result, the sample size problem is not that much important by applying qualitative research method.

The experts have been chosen according to the activity areas, it was important that experts would be related to internet marketing. The information has been looking on the Internet. After selecting the experts, it was contacted personally. The researcher was proposed to the experts, as well as the problem of the research and the goal: according to the experts, to figure out the concept of internet marketing quality; to determine the qualitative criteria, which could be adapted by evaluating internet marketing; mark out the internet marketing development problems, solutions. Most of the experts wanted to stay anonymous, but agreed to specify the occupied functions. In order to keep the anonymity the experts are named anonymously, such as Expert A, Expert B etc. and activities specified. Nine experts' opinions are analysed. Moreover, the accuracy of decision and evaluation is sufficiently high when the number of experts reach nine, so this number of experts is enough to obtain accurate information. Those methodological assumptions set out in classical test theory. It says that aggregate decision reliability and decision-makers number connects fast fading nonlinear connection. In the modules of aggregated experts' evaluation which are connected with equal weights, small groups of experts' decisions and evaluations accuracy do not descend to large group of experts' accuracy of decisions and evaluation (Baležentis, Žalimaitė, 2011).

From the experts who were performing in the survey, nine experts have been chosen:

- Expert A – e. marketing project manager. Field of activity – retailer of domestic appliances and electronics leader in Lithuania.
- Expert B – e. marketing department director. Field of activity – Bank.
- Expert C – marketing Project manager. Field of activity –Insurance.
- Expert D – Co and Director. Field of activity – information and communication. Lector of e. marketing.
- Expert E – Trade Marketing Project Manager. Field of activity - a mobile communications company operating in the Baltic countries.
- Expert F – Head of Marketing and Communications. Field of activity - advisory services.
- Expert G – Brand Manager. Field of activity - trade and service company with a well-developed e. marketing network in Lithuania.
- Expert H – The leader of electronic channel management group. Field of activity - a mobile communications company operating in the Baltic countries.
- Expert I –Online marketing manager. Field of activity - trade and service company with a well-developed e. marketing network in Lithuania.

Since the goal of the research is to figure out the concept of internet marketing quality and to determine the qualitative criteria, which could be adapted by evaluating internet marketing, the experts above have been chosen from different activity areas. However, all of the organizations they are working for, developing internet marketing or even provide the internet marketing services to other companies. By formulating questions of the survey, the aim was to find out the opinions of experts about internet marketing development, its' problems and solutions as well.

Research Data Analysis. In the beginning of the first questions' analysis, it was noted that the criteria will be accepted as the applicable qualitative criteria in order to measure the internet marketing quality, if more than a half experts agree or totally agree with the statement. With the first statement that the literature clearly determines the concept of *internet marketing quality*, two out of nine experts disagree or totally disagree. However, four experts are not sure, so the statement cannot be evaluated properly. Overall, it should be noted that this question must be discussed, because there is no clear point of view neither between the authors nor the experts. In terms of suggested criteria *design*, it could be applied as qualitative criteria, because five out of nine experts agree or

totally agree with the statement, which is more than a half. *Online distribution channels* could be also applied as the qualitative criteria, because five out of nine experts agree or totally agree with the statement. The survey results demonstrate that eight experts agree or totally agree with the *customer satisfaction* as a criteria and six out of nine experts agree or totally agree with the statement that *e-loyalty* could be applied as the qualitative criteria. Overall, all four qualitative criteria should be analysed in terms of internet marketing quality development and measurement.

According to second questions' answers, experts provide their insights about internet marketing quality. According to the experts internet marketing is qualitative if following aspects are achieved:

- Customer satisfaction (Experts A, B, D);
- ROI (Return on Investments) generation (Experts A, H, I);
- Accessibility anytime (24/7) and anywhere (via different online distribution channels) (Experts B, E, G);
- Target audience extension; customer involvement (Experts B, E, G).

To sum up the factors above internet marketing quality is: in accordance with the basics of marketing concepts, quality can be defined as reaching the consumers' satisfaction level, efficient use of cyberspace for potential users' involvement and target audience extension, and ROI generation for the company.

Respondents also were asked which of the following mentioned qualitative criteria is central according to the development of internet marketing quality. By this question, experts have been asked to distinguish the most important criteria or to propose the additional one, which, according to them, could be applied in the process of internet marketing quality evaluation. The experts' opinions diverged in Figure 1.



Fig.1. Central qualitative criteria for internet marketing

Source: authors

The Figure 2 shows that experts have different opinions about the central criteria. The experts were asked to exclude one of the following criteria or to provide the additional one. However, most of the experts provide few of most important criteria and additional as well. Experts A and B exclude *online distribution channel* as one of the most important criteria, but Expert B also thinks that *design* should be included between central criteria and provides additional criteria *Google keywords – content optimization*. Experts agree or totally agree with those criteria in the first question as well. The variety of opinions can be perceived. The experts do not provide one evolved criteria, but also it should be noted that all criteria have been chosen at least once. The online distribution

channels and customer satisfaction are criteria, which have been chosen twice, but it could not be said that according to the survey they are the central ones, because two out of nine choices would be no lens. On the other hand, the answers to this question bring us to the result that the importance of this issue is really deep and important, because it is hard to determine common criteria. Overall, two of the experts note that it cannot be distinguished one criterion, the complex of measures should be applied and they should be adopted all together, not one by one. In addition, consideration should be given to the purpose of the company and marketing strategy, what company is going to achieve. Overall, online distribution channels and customer satisfaction have been chosen twice, design and e-loyalty once. Additional criteria could be such as Google keywords – content optimization; consistent and long-term strategy; new customers' number; conversions; CPA, CPM and ROI.

Further the experts provide significant criteria, which could be used in order to evaluate the website design. Interesting fact is that some of criteria repeats by experts. *Attractiveness* is repeated by Experts C and E; *Usability* – by Expert C and D; *Clarity of display* – Experts B and E. It could not be said that one or another criteria is the most important, because some users focus on one and other users to totally other subjects. Overall, criteria such as attractiveness, usability and clarity of display have been mentioned the most by the experts. Some other mentioned criteria are as follows: *time spend reading the content*; *an opened page number*; *friendliness*; *SEO*; *the mutual link with social networks and the related external websites*; *adaption to specific product/service (visualization)*; *working links and functions of the website*; *user involvement*; *CES indicator*; *implemented goals of website developer*.

According to the answers of experts, the website design decision could be added with the elements, which could help evaluating the website design (see Figure 2).

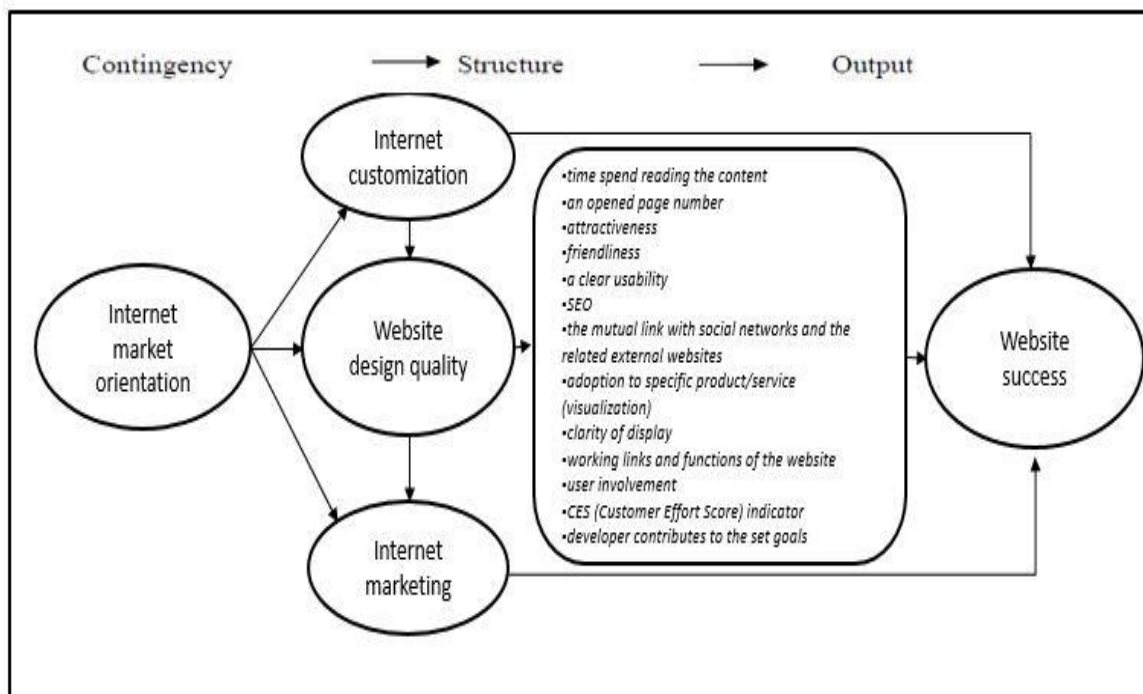


Fig.2. Completed website design decision

Source: authors

Overall, it can be said that internet marketing faces variety of questions. It should not be highlighted one main e-marketing qualitative criteria, because it depends on the goals of the company, marketing campaign and other aspects, which creates different issues. It is very important that experts suggest different opinions, because it only proves that organizations face different problems and they need to be solved in variety of ways.

5. Designing the Internet Marketing Qualitative Criteria Application Model

Designing methodology. Since the qualitative criteria are proposed and approved by the experts during the qualitative data analysis, it is beneficial to create the application model of internet marketing qualitative criteria, which could explain the value of the criteria and explain future applications. Scientific modeling is the creation of abstract or conceptual models. The science offers a wide range of methods and theories about the various kinds of scientific modeling. The main theory about scientific modeling is based on theories of philosophy, systems and knowledge visualization. Modeling is an essential and integral part in scientific activity.

Model analysis. The application model of internet marketing qualitative criteria (see Figure 3) is developed on the basis of:

- Analysis of qualitative criteria of internet marketing development and the issues setting;
- Analysis of qualitative criteria of internet marketing integration to e. business strategic development;
- Qualitative data analysis.

The model of internet marketing qualitative criteria starts with the input object of a short term goals, where the qualitative criteria are included: *design, online distribution channels, customer satisfaction and e-loyalty*.

Design. Forbes (2012) announce that any business must admit the power of a great design for customers' experience. Design-oriented companies put design at the heart of their company to build innovation and to constantly improve products, service and marketing trends. They recognize that a great design guarantees the differentiation, customer loyalty and higher profits. A well-designed website grants the customer to find the company whenever they trying to do it. A great content of the website helps customer to find it through search engines. Moreover, the website most of the times is one of the first touchpoints though which the potential customer will start building the trust with the company (Greenberg, Kates, 2014). Furthermore, the qualitative study determines that design should be adapted in the process of internet marketing quality development.

Online distribution channels. The literature (Greenberg, Kates, 2014) pays attention to digital media channels in order to reach the customers. On the one hand, the customers want to reach the information through the most convenient ways to them. On the other hand, information quality and distribution is also important from the business perspective. The variety of distribution channels help business collecting more requisite information about the customers and build the personalization. Business sites such as aheadWorks (2015), e. commerce platform (2015), eMarketer (2014) pays especially strong attention to online distribution channels as one of the most important trends for e. marketing. Moreover, the qualitative studies' results reveale that online distribution channels should be applied as the qualitative criteria for internet marketing.

Customer satisfaction. Chaffey (2009) declares that the most successful internet marketing factor to meet the needs of customers is satisfaction. According to analysed literature the customer satisfaction has been proposed as a qualitative criteria to internet marketing development. Even more the experts of qualitative study agree that customer satisfaction is an important criteria in internet marketing evaluation.

E-loyalty. E. business is based on customer orientation, so it is important to recognize customers' needs and expectations in order to maintain the competitiveness and customers' loyalty (Turban et al., 2002). E-loyalty is also accepted as the qualitative criteria for internet marketing in the qualitative survey.

In order to create or improve the internet marketing quality the development process should be started from the qualitative criteria (mentioned above) adaption in a short time of period. Important aspect is that the efficiency will be reached if the complex of measures will be adapted. One of criterion adaption is not adequate, because successful business has to follow the internet marketing trends, set the objective goals and adapt to fast changes in the market.

After the complex of measures is adapted and internet marketing meets the requirements of the qualitative criteria set, the following stage is **solutions**. Solutions should be implemented in a mid term of period in order to solve the rising problems in the process of internet marketing quality building. Variety of problems have been determined during the qualitative survey. Experts agree that the most common problems are goals setting; lack of resources and budgets; opportunity to measure; perception problems; huge flow of information; customer interest; mobile friendliness; standing out from the others; customer loyalty. The internet marketing quality development will be more successful if at least the most common problems will have determined solutions. However, the stage of solutions implementation might bring benefit to organizations in order to prevent at least the most common rising problems.

The last stage of successful internet marketing quality development is positive **ROI** generation, which according to the modeling theory is based on output object. In the long perspective every business needs to generate positive ROI. If there are no profit for the company, none of internet marketing goals will bring the benefit to organization. After the complex of qualitative criteria is adapted and solutions implemented in order to reach the internet marketing quality, the result should be reached: objective determination of internet marketing goals and strategy; sufficient resources (such as programming resources, competent marketing professionals; internet marketing knowledges (know-how) in the organization); elements for internet marketing measurement and evaluation; customer involvement; customer trust and loyalty building. The results above would bring the organization to successful ROI generation.

Overall, the point of the application model is to achieve the positive ROI through the qualitative criteria and solutions adaption in the process of internet marketing quality development. Moreover, the model might be adapted in the process of creating internet marketing quality or in the process of improving the already existing internet marketing quality. In addition, the application model is based on two perspectives: to implement customer oriented internet marketing (adaption of qualitative criteria) and business perspective, which aims to generate positive ROI.

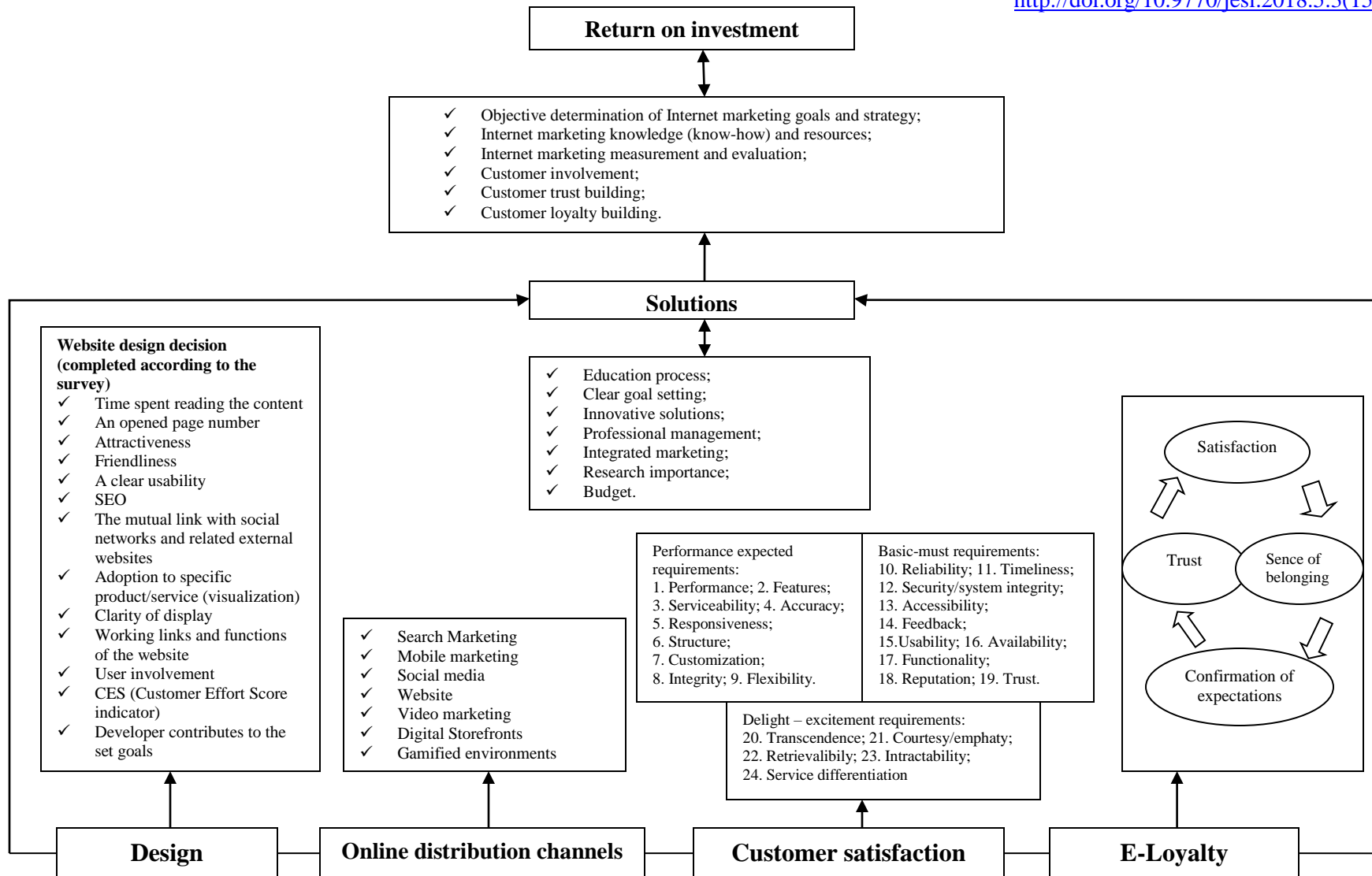


Fig.3. Internet marketing qualitative criteria application model
 Source: authors

Conclusions

1. Universal concept of internet marketing is not defined, however it has multiple quantitative and qualitative aspects. Qualitative aspects have been the focus of this paper. Principal emerging qualitative criteria for internet marketing assessment are design, online distribution channels, customer satisfaction and e-loyalty. Similarly to other e. business phenomena, internet marketing may be approached from two perspectives – customers’ and businesses’. In order to increase the efficacy of the internet marketing, as well as reach the positive performance measure ROI, it is very important to ascertain the customers. The qualitative criteria from customer experience shall be included in the assesment of the internet marketing quality.
2. Based on qualitative expert interview data analysis, it was determined that design, online distribution channels, customer satisfaction and e-loyalty are most important criteria of internet marketing assessment. Since the weight of individual criteria cannot be foretold by this one study, the complex of measures should be adopted in order to achieve the internet marketing quality. Also, the website design decision framework shall be developed according to experts’ suggested criteria. The main problems facing the internet marketing campaign development are goal setting; lack of resources and budgets; opportunity to measure; perception problems; huge quantities and flows of information; customer interest; mobile usability and user-friendliness; differentiating from the others; as well as customer loyalty.
3. Based on the identified qualitative criteria pertinent for internet marketing, the qualitative model of internet marketing design and assessment is proposed. The initial input of the model is short term goal determination, where the complex of qualitative criteria are assumend. The next stage of the model is solutions’ adaption in a mid term in order to solve the rising problems in the process of internet marketing quality building. Finally, the output of the model in a long perspective is a positive ROI generation, which is the final goal of any business and internet marketing campaign. Moreover, the model may be adapted in the process of creating new internet marketing campaigns or in the process of improving the already existing internet marketing campaign quality. In addition, the aplication model is based on two perspectives: to implement customer oriented internet marketing (adaption of qualitative criteria) and business perspective, which aims to generate a positive ROI.

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PECULIARITIES OF ILLEGAL IMMIGRANT'S INTRUSIONS INTO ROAD FREIGHT TRANSPORT UNITS IN THE FRANCE - UK CORRIDOR

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Abstract. The World Economic Crisis has increased such processes as poverty, discrimination and war. As a consequence, many people from Africa, Middle East and Asia started to immigrate to Europe. There were over one million unauthorized immigrants entering Europe in 2015. However, not all countries want and can accept refugees. A long-time frame for assessing asylum applications or frequent rejections encourages refugees to migrate illegally by intruding freight transport units to cross the border of their chosen European country. The intrusion of illegal immigrants into road freight units to cross borders without being noticed has caused a great deal of damage to the international freight transportation companies. This article presents results of the study aimed at investigation of peculiarities of illegal immigrant's intrusions into road freight transport units moving along the corridor France – United Kingdom.

Keywords: refugees, illegal immigrants, European migrant crisis, road freight transport, road freight transport risks, human factor.

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JEL Classifications: R11, R41, 019

Additional disciplines (besides field of economics reflected in JEL classifications): transport engineering; environmental engineering.

1. Introduction

The World Economic Crisis has increased such processes as poverty, discrimination and war. As a consequence, many people from Africa, Middle East and Asia started to immigrate to Europe. There were over one million

unauthorized immigrants entering Europe in 2015. However, not all EU countries want and can accept refugees. A long-time frame for assessing asylum applications or frequent rejections encourages refugees to migrate illegally, by intruding freight transport units, to cross the border of their chosen European country.

Illegal migration is noticed all over the world in all transport modes. Meanwhile European migrant crisis mainly touch land transportation by road and rail freight transport, ignoring the rest. The intrusion of illegal immigrants into road freight vehicles to cross borders without being noticed has caused a great deal of damage to road freight transportation companies, involving property and cargo damage, physical and psychological violence against drivers, etc. Currently, the debates over the problems caused by illegal immigrants to European road freight transport companies are not widely addressed.

This article presents results of the study aimed at investigation of peculiarities of illegal immigrant's intrusions into road freight transport units moving along the corridor France – United Kingdom (through the Port of Calais).

The purpose of the research described in this paper is to highlight the tendencies of intrusions to the road freight transport unit and identify riskiest spots, where such incidents take place.

The first chapter of this article analyses current state and reasons behind the European migrant crisis. Conclusion is made that part of immigrants do not intend to stay in the first country of the EU they had arrived to, but rather are trying to get to these, which offer better social conditions and living standards. As a consequence, part of these immigrants tries to get to a “promised land” illegally. Next chapter discusses importance of road freight transport in the process of relocation of migrants and identifies types of risks that might occur during the process of transportation. Third chapter starts with a brief description of methodology that was applied to investigate situation on the route France – UK, and then continues with presentation of obtained results pointing out peculiarities of illegal immigrant's intrusions into road freight transport units. The article ends with presentation of risk map and summarizing conclusions.

2. State of the art and reasons behind the European migrant crisis

The European migrant crisis, or the European refugee crisis, is a term given to a period beginning in 2015 when rising numbers of people arrived in the European Union (EU).

Human migration - is the movement of people from one place to another with the intention of settling in a new place. Migration is a constant feature of evolving mankind history – homo-migrants are described since the homo sapiens times (Bade & Münz, 2000; King & Lulle, 2016; Tumalavičius, Nikolayevskyy, & Endziņš, 2017).

According to P. J. Oiarzabal and U. D. Reips (2012), migration can be conducted individually, in families or large groups. Harzig, Hoerder, and Gabaccia (2009) claim that modern human mobility enables both – micro and macro migration.

As suggested by U. D. Reips and L. Buffardi (2012), it is possible to distinguish types of migration based on psychology: voluntary and forced. D. Courgeau–Andevalelievre (2016) states that voluntary migration is based on an internal self-help system and depends on how strongly an individual convinces himself/herself that migration will improve his/her life quality.

Meanwhile, forced migration is caused by an individual's psychological fears due to certain factors surrounding the environment that threaten his well-being or life (Banaite & Tamošiūnienė, 2016; King & Lulle, 2016; (Banaite

& Tamošiūnienė, 2016; King & Lulle, 2016; Shuaibu & Oladayo, 2016; Świerczyńska, 2017; Tvaronavičienė & Černevičiūtė, 2015; Kot & Pigoń, 2014, Androniceanu, 2017). People who have experienced psychological or physical abuse feel forced to migrate, which is why the psyche of such people is often impaired. These individuals are difficult to predict and can lead to various difficulties, which can cause much damage to both political and administrative units (Courgeau & Lelièvre, 2006; Masood & Nijkamp, 2017; Carra et al., 2016).

When the discussion comes to the EU migrant crisis, rather than referring to economic migrants, who are looking for better lives, it discusses people, who try to save their lives (such as refugees and asylum seekers). The root reasons for forced migration, were hidden in 2007 world-wide financial crisis, civil wars in the South-East (Syria, Iraque, Iran, Afghanistan, Pakistan, etc.), and natural disasters (droughts, floods, earthquakes, hurricanes, etc.) in Africa (Lake Chad Basin, South Sudan, Somalia, etc.). All these factors brought hunger, poverty, discrimination, persecution and wars. By the UN Refugee agency 65,3 million people, or 1 person in 113 were displaced from their homes by conflict and persecution in 2015 (King & Lulle, 2016). This number of people movement is the highest level since World War II.

Most of the migrants came from the Muslim-majority countries of regions in the South and East of Europe, as well as Western Asia, South Asia and Africa.

According to the United Nations High Commission for Refugees, the main countries from which refugees comes to the EU are Syria, Afganistan, Somalia, Sudan, South-Sudan, Congo Dem.Rep., Centrl African republic, Iraque, Eritrea, Pakistan and etc. European countries, which are mainly reached by refugees first, are Italy and Greece. It is due to a comfortable geographic position, between South-East Europe and Africa (see figure 1).



Fig. 1. Main migrant's paths to the EU

Source: Kobler, 2017

It is important to note, that Italy and Greece are just the first stop, as the purpose is to move to countries with better social benefits, and familiar languages.

According to Eurostat (2016) EU member states received over 1.39 million first-time asylum applications in 2015, more than double that of the previous year. Five states Germany, Hungary, Sweden, Austria, Great Britain) received around two-thirds of the EU's asylum applications in 2015 (UNHCR - The UN Refugee Agency, 2017).

Assessing the number of registered asylum applications and the number of registered refugees arriving to Europe from 2008 to 2015, it can be noted that not all arrivals submit applications for asylum. This leads to the conclusion that those, who did not submit asylum applications, will settle in and stay in the country illegally or hide from the law migrating between European countries, using illegal methods. Routes which illegal immigrants use in order to reach their final destination in the EU are presented in figure 2.

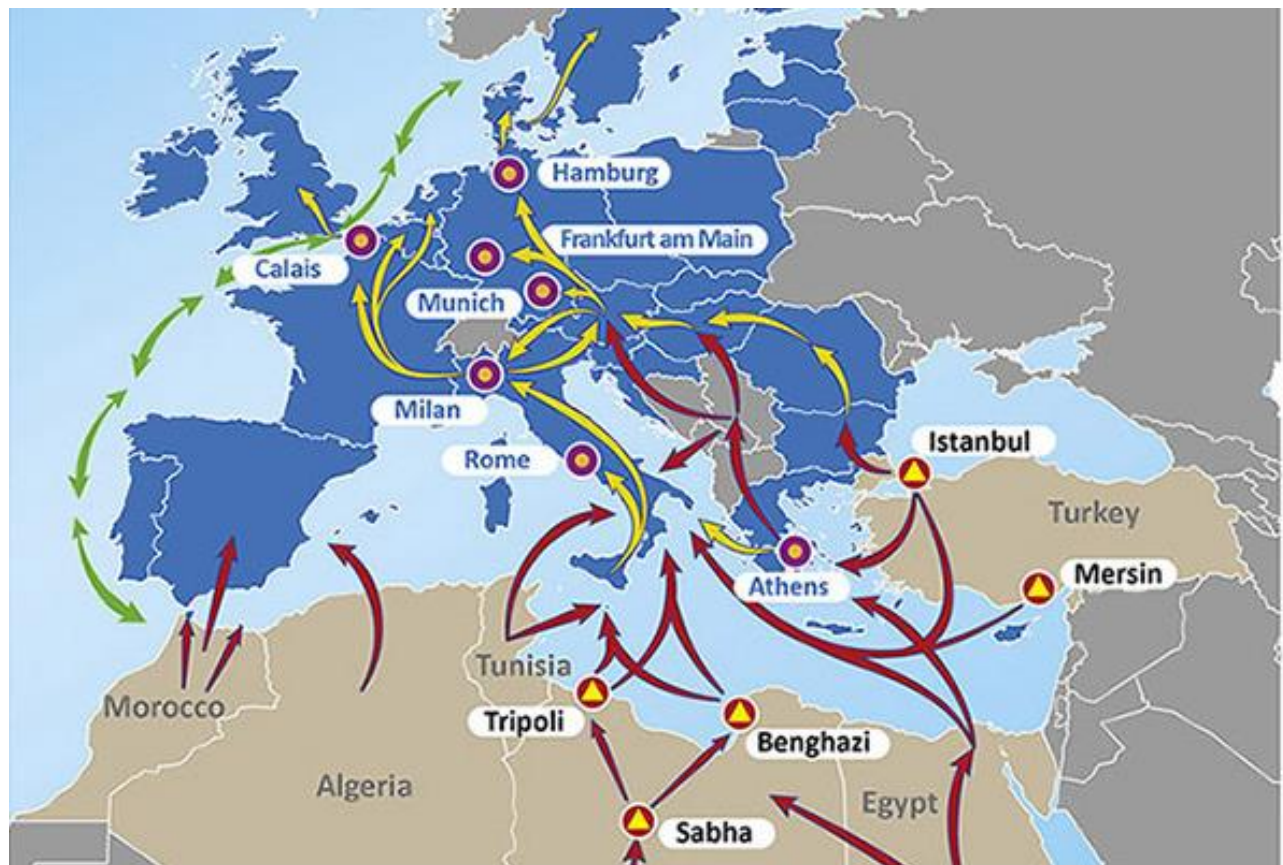


Fig. 2. Migration routes to the primary country of arrival, and subsequent refugee movements inside Europe

Source: Katehon think tank. Geopolitics & Tradition (2017)

There are two types of people's migration: illegal migration (taking risk by themselves, with various options) and people smuggling (paying somebody to get to the target destination). Illegal immigrants are the people who have come to another country without a visa, temporary or permanent residence permit. The migration of people becomes illegal when they cross national borders without the permission from the national authorities. Refugees who try to enter another country in illegal ways by risking their own well-being, health and

life are usually those whose basic physical and security needs are not satisfied, but they are not necessarily persecuted people. Individuals suffering from hunger or financial deprivation may also fall under this category.

The EU's position is to provide refugees with an asylum only if these illegal immigrants–refugees will officially submit application documents and further on will be considered as eligible candidates for asylum.

There are distinguished two groups of illegal immigrants:

1. Refugees who were given a legal asylum. Supported by the EU or other countries, these refugees are transported by passenger transport to their destination points.
2. Refugees who do not come from the world's current "hot spots" and war zones. These refugees are not persecuted and unlikely to receive an asylum status or will not even apply for it and finally will be sent to their own country. As well as persons who are suspicious, offended the laws of their "original country", deliberately destroyed their identification documents, or simply out of great fear or distrust, attempt to find carriers offering "human trafficking", or secretly and illegally break into vehicles with a hope to reach their country of destination. Refugees of this type are the ones that cause the greatest damage to companies providing transportation services.

3. Role of human factor in transportation process

Even if migrants use different first paths of migration to the EU (Mediterranean sea or South Eastern), once they reach Europe, everyone travels using land transport, as it is essential and connective movement unit between EU countries.

Transportation is one of the most important factors in the global economy as it is a tool for moving product from less useful place to more useful place, creating added value, changing the product's location as needed. The same is truth about the passenger transportation. Transportation assures necessary level of mobility and opens broad prospects for particular human being.

The transportation is the part of logistics and it is the main link between all of the stages of the supply chain. Transportation is the base of efficiency and economy in business logistics and expands other functions of logistics system. In addition, a good transport system performing in logistics activities brings benefits not only to service quality, but also to the company's competitiveness.

Land logistics is a very important link for logistics activities. It extends the delivery services for air and maritime transport from airports and seaports. The most positive characteristic of land logistics is the high accessibility level in land areas.

Road freight transport is the only transport mode, which ensures transportation from door to door. Compared to other transportation modes (sea, rail, air), road transport used worldwide has less limits of path restrictions. It is much more flexible, and is the best solution for meeting price and speed ratio.

However, road freight transportation is one of the most unsafe methods for moving goods. It faces a lot of dynamic risks.

Risk typologies are analysed by S. Tang and M. Nurmaya Musa (2011) and P. Kouvelis, Ch. Chambers and H. Wang (2009). The authors point out that the overall external risk consists of the following: environmental, industrial and organizational factors. According to S. Rao and T. J. Goldsby (2009), these factors have effects on risk proneness in a supply chain.

Environmental risk variables are the ones that have a direct impact on the overall business context over all industries (Ritchie & Marshall, 1993). Although this effect may be different and may be affected by different process areas, the underlying assumption is that the uncertainty created in the environment can give rise to some degree of insecurity (Kouvelis et al., 2009). According to K. Miller (1992), general environmental variables include political instability, government policy instability, macroeconomic uncertainties, social uncertainties, and natural uncertainties.

Such supply chain processes as transportation are not fully protected against different types of risks that may affect such negative consequences as delays, additional costs, and pollution. According to B. E. Asbjørnslett et al. (2008), threats in a supply chain can be divided into accidental and deliberate. Also, supply chain risks can be classified into operational risks and disruption risks.

Operational risk is associated with inherent uncertainty, such as unclear customer needs, vague supply planning, fluctuations in costs and demands.

Disruption risk is linked to major disruptions due to natural or man-made disturbances, disasters or catastrophes (Tang & Nurmaya Musa, 2011). Nowadays one of the most topical, but yet not fully covered disruption risk that may have an impact on separate processes of the supply chain (transportation in particular) is associated with human factor and his activities.

Authors (Helander, 2006; Hollnagel, 2014; Karwowski, 2006) refer to the human factor as an area of ergonomics examining human relationships, opportunities and drawbacks in a workplace, but not as a separate factor impacting other than workplace process results.

In accordance with the above-mentioned authors, it is possible to provide a definition to a human factor: human factor – is a factor that determines human judgement, limited by his psychophysiological capabilities and is expressed through his/her behaviour and attitude.

A human may become unpredictable and incapable of controlling due to his/her ability to reason and rely not only on instincts.

Environmental conditions are one of the most important aspects defining human reasoning. A human does not only reside in the environment, interacts with it, but also changes it by participating and creating diverse processes. Certain changes in turn relate to physical and mental personality traits, stress, satisfaction, illnesses, pleasure, etc. (Dul et al., 2012). The accumulated complex of certain environmental factors may encourage a person to make certain decisions and take up actions. People, who are most likely to commit a crime, usually are the ones, who do not possess any assets and, therefore, often feel like they have nothing to lose. Such people are usually confused, not aware of what behaviour is socially acceptable, and are psychologically unstable. If a person is hungry, does not have a shelter, or if he feels threatened, he is ready for anything, without taking into consideration whether his actions are right or wrong, legal or not.

Illegal actions made by human factor in transportation process might lead to the disruptions of entire supply chain, which may prevent economic growth of business entities, and, therefore, must be evaluated as source of risk.

4. Description of applied methodology and key results of conducted research

In order to illustrate risks associated with human factor and might occur during the transportation process, well known problem case dealing with illegal immigrants along the route France – UK, was chosen. The main aim of conducted research was to highlight the tendencies of intrusions to the road freight transport unit and identify riskiest spots, where such incidents take place.

A questionnaire-survey method was applied. Managers and specialists of European international freight companies that were transporting cargo to the United Kingdom were presented with questionnaires.

A research questionnaire consisted of 2 blocks to determine the specifics of certain phenomena.

The first block of questions was aimed at defining the tendencies of illegal immigrant's intrusions into road freight transport units moving in the direction of the UK through the port of Calais.

The second block of questions was aimed at identifying the most risky locations and creation of the risk-map representing the most risky hotspots, where the level of intrusions is the highest.

The research was conducted verbally and in written. The questionnaire was sent to 41 representatives; however, due to only 17 fully completed and returned questionnaires, a verbal interview was carried-out to receive additional 19 questionnaires. Overall, 36 respondents took part in the research.

First, the tendencies of illegal immigrant's intrusions into road freight transport units were investigated.

One of the first questions was whether transport companies have faced with intrusions of illegal immigrants. The results have shown that this problem is particularly relevant. 92% of companies noted that they had encountered with the problem of intrusions into road freight transport units.

Analysis of data obtained during the survey proved that 72% of accesses into the road freight transport unit on its route to UK happened secretly (unit was intruded). Other 11% of accesses happened because the driver of road freight transport unit accepted certain reward for the assistance to immigrants to get to UK in his transport unit without being noticed. 6% of accesses took place because drivers were threatened. The remaining 11% of all events happened because of unknown reasons. This situation is presented in the figure below (see figure 3).

Results of research also proved that majority of illegal migrants tend to form smaller or larger groups rather than try to access road freight transport unit alone. In 89 % of all access cases there were detected more than 1 illegal intruder. This is because "team-work" facilitate process of intrusion.

More deep analysis of this phenomenon revealed that:

- only in 17% of all access cases only one illegal intruder was detected;
- in 42% of all access cases number of detected intruders varied from 2 to 5;
- in 22% of all access cases number of detected intruders varied from 6 to 10;

- -in 6% of all access cases number of detected intruders varied from 11 to 20;
- -in 3% of all access cases number of detected intruders exceed 20 (see figure 4).

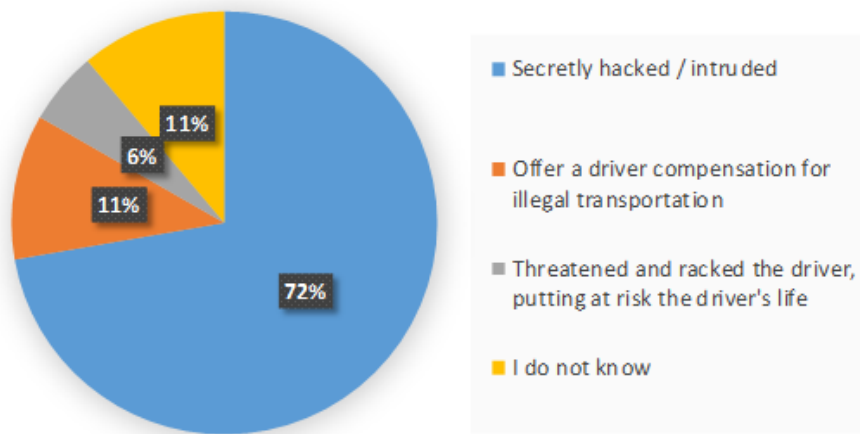


Fig. 3. The illegal migrant access to the road freight transport unit (compiled by the authors)

Source: compiled by authors

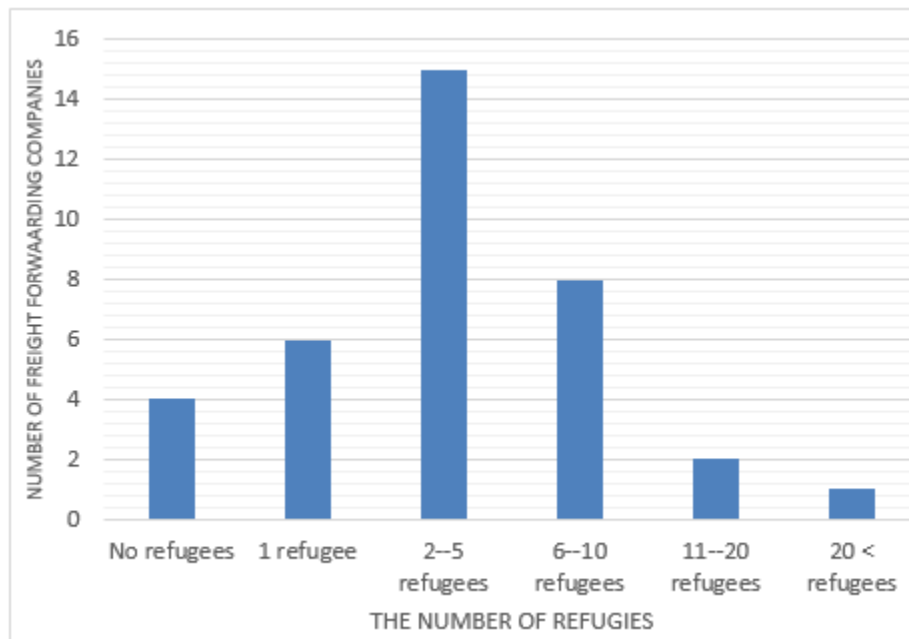


Fig. 4. Number of illegal immigrants intruded into a freight transport unit at the same time

Source: compiled by the authors

Conducted research also revealed the main parts of road freight transport unit, where intruders were detected:

- in 79% of all cases illegal intruders were detected in semitrailers;
- in 11% of all cases illegal intruders were detected in driver's cab;
- in 10% of all cases illegal intruders were detected in different parts of towing vehicle.

Results of the provided analysis also allowed identify time of the day, when frequency of intrusions is at its highest. Results are provided in figure 5. It is clear that majority of intrusions happens during the night time.

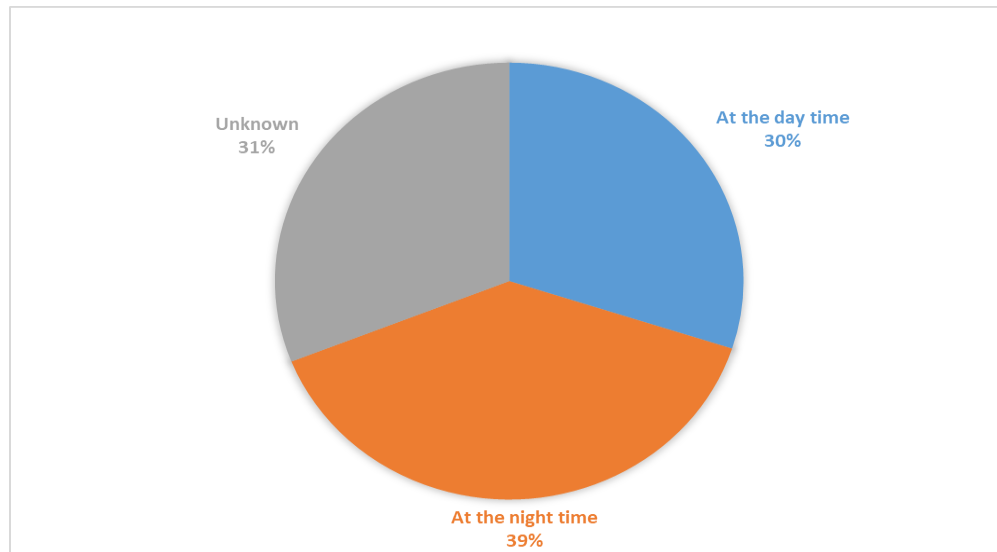


Fig. 5. The time of the day, when the intrusions of illegal immigrants occurs the most

Source: compiled by the authors

Next part of the research was dedicated to reveal the riskiest locations where intrusions might take place. Answers of the respondents allowed concluding that:

- 45% of intrusions happen when transport unit stays at insecure parking area;
- 25% of intrusions happen when transport unit slowly passes border area;
- 8% of intrusions happen at gas stations;
- 8% of intrusions happen at secure parking area;
- 14% of intrusions happen at unknown places.

Figure 6 presents the most frequent locations where fact of intrusion had happen. It is obvious, that illegal migrants most likely will enter the road freight transport unit during the border check (33% of all incidents), during the transportation process (31% of all incidents) and during the driver's break stop (17% of all incidents).

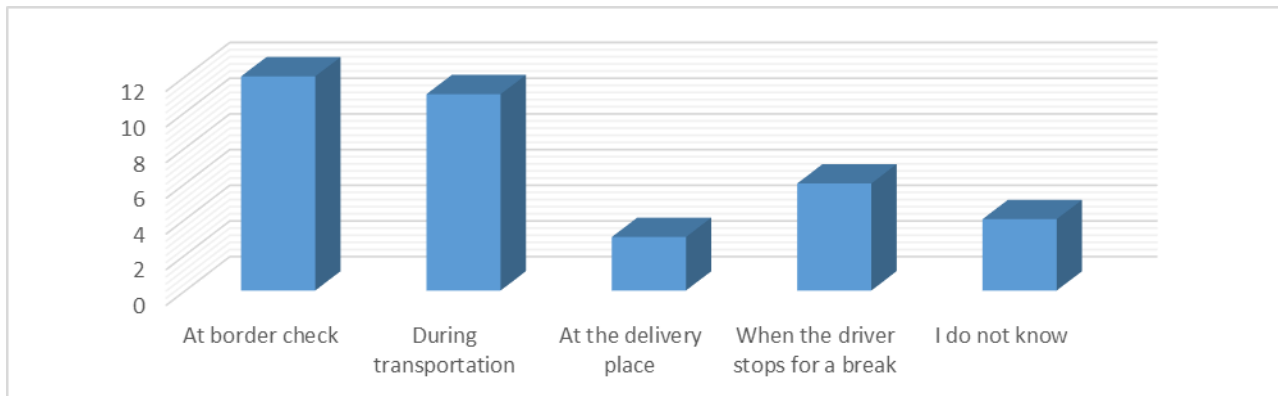


Fig. 6. The location of refugee intrusion to the truck

Source: compiled by the authors

Also questionnaire allowed identification of countries, where intruders invaded to vehicle (see figure 7). In this case the leading countries are France (47% of incidents), Germany (18% of incidents) and Spain (12% of incidents).

At last, respondents identified the most dangerous cities and regions, where intrusions had happened more frequently (see table 1). Results provided in the table confirm that the most risky regions are in France, Germany, Spain, Belgium and the Netherlands.

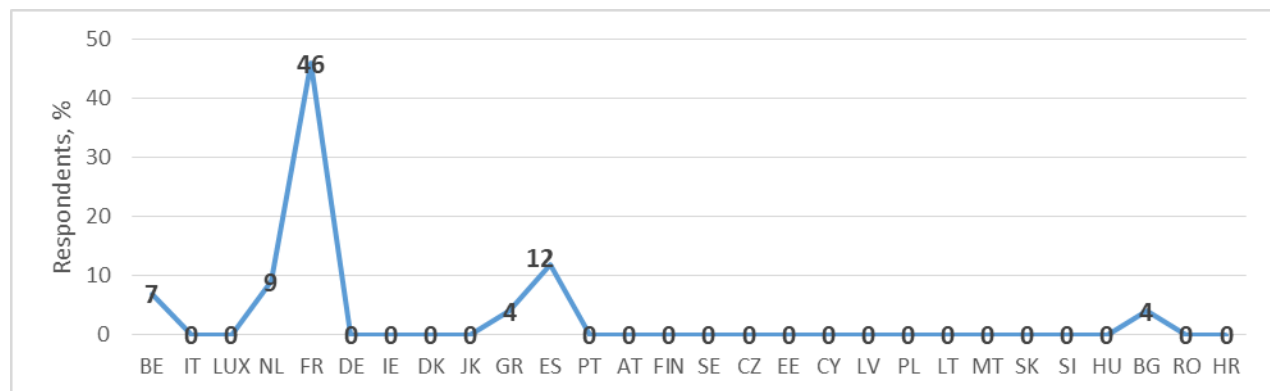


Fig. 7. Countries, where illegal immigrants have invaded to vehicle

Source: compiled by the authors

These findings formed the base for the development of risk –map (“crime hotspot”) – the map which represents geographical areas associated with certain crimes. Such map is presented in figure 8 and is based on the data of identified locations of intrusions and frequency of intrusions at these locations. Conclusions can be made that concentration of these risky locations is higher on the northern part of France, Germany Belgium and the Netherlands, since there are much more hotspots, e.g. ports, which are gates to the UK. The most risky location and worst situation is in France, since here we have camp of immigrants situated next to Calais seaport. This is the most important hotspot, where immigrants form smaller or bigger groups and try to break into road freight transport units.

Table 1. Cities, regions where refugees invaded into vehicle

City or region	Country	The frequency of refugee intrusion
Calais	France	62
Coquelles eurotunnel	France	32
Dunkerque	France	41
Rotterdam	Netherlands	21
Antwerp	Belgium	12
Le Havre	France	12
Lille	France	8
Stuttgart	Germany	5
Koln	Germany	4
Bilbo	Spain	3
Mannheim	Germany	3
Vlissingen	Netherlands	2
Terneuzen	Netherlands	1
Oostende	Belgium	1
Donostia	Spain	1

Source: compiled by authors

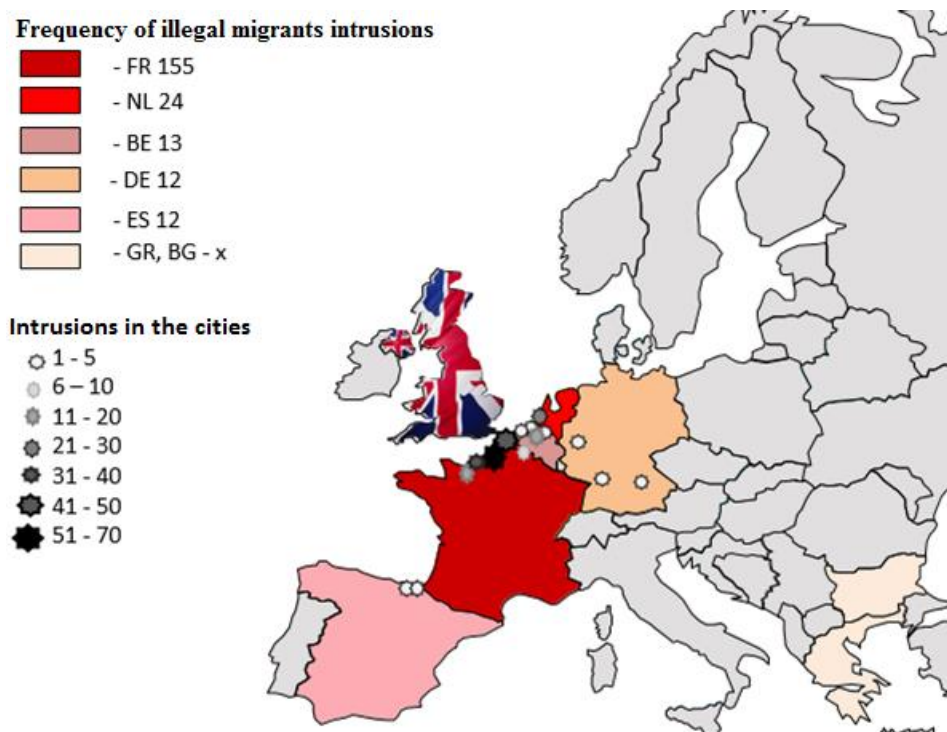


Fig. 8. The risk-map of illegal migrant's intrusions

Source: compiled by the authors

Conclusions

Migration is one of the daily processes in people's lives. Transport and migration are inseparable from one another; however, the transfer of a person to another place, disobeying the law, is a criminal act. That's why refugees and illegal immigrants are elements of disruption risks and deliberate threat. Due to their unpredictable actions they are classified as an economic-political risk group. It is an environmental risk factor affecting transport in certain geographic sectors.

The World Economic Crisis has increased such processes as poverty, discrimination and war, and, as a consequence, many refugees from Africa, Middle East, Asia started to immigrate to Europe. A long-time frame for assessing asylum applications or frequent rejections encourages refugees to migrate illegally, by intruding road freight transport units, to cross the border of their chosen European country.

The intrusion of illegal immigrants into road freight vehicles to cross borders of EU countries without being noticed has caused a great deal of damage to road freight transportation companies, involving property and cargo damage, physical and psychological violence against drivers, etc. Disturbances that happen because of illegal immigrant's intrusions have even more serious consequences: the disposal of cargo due to illegal immigrant intrusions into freight vehicles, termination of factory operations, dropping of sales, delays in the production, or product delivery into the market.

Results of conducted study prove that intrusions into the road freight transport units along the route France – UK became better organized and planned. European road freight companies are taking preventive measures in order to reduce or avoid such incidences; however, they are unlikely to be effective enough. Private sector is not able to control the risks of illegal immigrants through its preventive measures alone. Risk map, developed on the basis of results of conducted investigation, identifies main hot spots where majority of incidents happens, as well as key peculiarities of such incidents. This might serve as initial background for the cooperation between private and public sector and joining their efforts towards elaboration of common plans and actions necessary for solving this problem in the nearest future.

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RELATIONSHIP BETWEEN ADMISSION GRADES AND ACADEMIC ACHIEVEMENT

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Abstract. The predictive validity of standardized eligibility test for college admissions is a matter of debate and controversy. Standardized admission test came into vogue in the later part of the previous century. It gained traction due to various reasons. The main reason for this is the heterogeneity of high school GPA and the inherent drawbacks of teacher made tests. Often teacher-made tests fail to follow the basic rules of test construction, and are hence considered to be of poor quality. Standardized admission tests came to be widely accepted due to its presumed scientific predictive validity. Though number of studies has examined the predictive validity of standardized admission tests with respect to various health courses, there is a gap in literature with respect to business students. This study examined the relationship between the admission grades (high school GPA and GAT) of Saudi college students and their academic achievement. The result of the study points towards a strong relationship between the two variables.

Keywords: Admission grades, Standardized admission test, Academic achievement

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JEL Classifications: A2, A29

Additional disciplines: educology; management education

1. Introduction

Most graduate programmes stipulate that students meet certain basic academic requirements, to be considered for admission. It is an accepted notion the world over that, due to the marked variance in the quality and system of grading in the high schools, it would be grossly unfair if admission decisions are based solely on high school

grades. As such, it is now a common practice in many countries to have standardized tests for admission to universities (Curtis, Lind, Plesh & Finzen, 2007; Kuncel et. al., 2005; Shulruf et al., 2010). This could take the form of either aptitude or achievement tests, or both. While aptitude tests focus on assessing the verbal and mathematical abilities and are usually “general” in nature (Koljatic, Silva, and Cofré, 2012); achievement tests are meant to measure accomplishments of the candidates, and are mostly based on certain guidelines and concepts that the students are likely to learn in future (Atkinson, 2001).

Till the recent past, the GPA of the high school examinations were the sole basis on which college admission decisions were taken. This made the chances of admissions to universities and colleges varying from school to school. Admissions used to mostly depend on the quality of education at the school, its location, type, and so on. These differences of individual schools used to yield inconsistent criterion for admissions to universities and colleges. Further, the high school examinations contained several subjects like English, Mathematics, science subjects like physics, chemistry, etc. It is this heterogeneity that prompted educational administrators to design a standardized admission test. According to Beatty, Greenwood & Linn (1999) there are three benefits standardized admission tests – standardization, efficiency and opportunity. Standardization; because the difference in high school curricula, course content and differing standards in grading standards can be eliminated due to such tests. Efficiency is possible because standardized admission tests can be conducted a relatively low cost to students and are economical and efficient for the institutions as they have the possibility of comparing vast numbers of applicants within a short period of time. Opportunity is possible since students can showcase their talents, even though their academic grades may not be strong or did not have the advantage of attending prestigious schools.

Further, the notion that students with high scores in standardized aptitude and achievement tests are most likely to succeed academically; due to its predictive validity, universities and colleges accord considerable importance to it (Evans, 2012; O’Connor & Paunonen, 2007). As such better grades in standardized eligibility tests are considered a basic requirement for admission to university programs. This is based on the thought pattern that, learning being an accumulative process, student admitted with higher entry qualification is expected to be well prepared for the course content than those with lower qualifications. A number of studies have been conducted in various parts of the globe to find out the relationship between excellence in eligibility tests and academic performances (AlQataee, 2014; Feldman, 2005; Gropper, 2007; Hughes, 1983; McIntosh and Munk, 2007; Rigney, 2003; Sulphey, 2010; Winter and Dodou, 2011).

As in other parts of the world, students of KSA are provided admission to business programmes based cognitive assessment and non-cognitive assessment. While cognitive assessment is made based on their grades in the qualifying school examinations, the non-cognitive assessment is made based on the standardized eligibility test.

The eligibility test conducted in KSA is the General Aptitude Test (GAT) – also known as “*Qiyas*”, and the standard achievement admission test (SAAT) for science and health colleges. The test is conducted by National Centre for Assessment in Higher Education (NCAHE), which is under the Ministry of Education. The purpose of the standardized testing among other things is “to engage in fair assessment at all levels of education and guide the use of data to promote effective education” (NCAHE, 2010). The format of the test is of multiple choice questions (MCQ) in nature, and each student has a maximum of three attempts while studying in the final year of high school. The best score of all the three attempts is considered for admissions. Normally a student achieving a minimum of 50 per cent score in the test and the eligibility examination is only considered for admission to the graduate programmes conducted by Universities.

The proposed study intends to examine the extent to which the entry qualifications and eligibility tests can be used to predict students’ overall academic performance in KSA. Determining the predictive validity of GAT is important as it is the sole basis for screening prospective students entering the University system. It is also the

basis of identifying applicants for the academic scholarships offered by the Government, regardless of their place of residence, social standing or ethnicity.

2. Research Problem and objectives

The world over many studies has been conducted to assess the relationship between the eligibility test scores and academic performance (Evans, 2012; Feldman, 2005; Gropper, 2007; McIntosh and Munk, 2007; Rigney, 2003; Sulphrey, 2010; Winter and Dodou, 2011). The results have provided valuable and interesting insights into this area. A few studies in this area have also been undertaken in KSA (Abu Zaid, Khunaizi, and Garni, 2014; Al-Alwan, 2009; Alnahdi, 2015; Hitchcock, Onwuegbuzie, and Khoshaim, 2014). However, most of these studies examined either medical or related disciplines like dental, nursing, etc. A fair review of literature could not identify studies that examine the relationship between standardized eligibility tests and academic performance among business students in Saudi Arabia.

The study focuses on and explores the relationship between the scores earned in the eligible tests and the academic scores earned by the students. The insights of the study would be of great interests to academicians and academic administrators as it would provide valuable suggestions to improve the intake quality of the students. It will also be of wider importance in the interests of the Saudi academic circles, the organisations who employ them and the society in general. Based on this, the research objectives identified for the present study are:

1. To investigate into the predictive validity of standardized eligibility tests on:
 - a. Students' performance in preparatory course
 - b. Students' future academic achievements
2. To find out the relationship between the family background and academic achievement of students.

3. Literature review

The world over there exist wide heterogeneity in the admission process of various graduate and masters academic programs, though most of them are based on the scorings of standardized eligibility tests. Some such prominent standardized tests include SAT (Scholastic Aptitude Test), CAT (Common Aptitude Test), the GMAT (Graduate Management Admission Test), etc. Most of these eligibility examinations test the students about their verbal and mathematical ability.

In KSA the eligibility test conducted for graduate admission is GAT. All Saudi students desirous of gaining admission to any university are required to take GAT. The test measures the analytical and deductive abilities of students. The test is so designed that it examines the student's general capacity for learning, without focusing on any specific subject or topic. The abilities/skills that are tested in GAT include reading comprehension, recognizing of logical relations, problem solving using mathematics, inference and measuring capacity (www.qiyas.sa). It also considers the potential of the student to learn, in addition to the proficiency in a particular area of study. Universities in Saudi Arabia generally consider both GA and the high school GPA. Some institutions also consider the scores earned in and achievement assessment test known as National Achievement Test (NAT). Different universities and colleges uses varying formula for weighing the three scores for generating a single score for admission decisions.

The school GPA is often found to be independent of GAT performance. There are ample instances wherein students who perform considerably well at high school examinations fail to do so in GAT. This is often a matter of grave concern among parents and education administrators. This variance in student performance has also raised many unanswered questions. Some academicians attribute this variance to the school curricula, which lays emphasis more on memorization than application of knowledge as well as critical thinking. Many educators are

now of the opinion that GAT has provided a level playing field with respect to college admissions (Hitchcock, et al, 2014). It is also opined that the family connections, which previously might have determined access to college is now waned due to the emphasis on standardized test.

Standardized tests have gained traction all over the globe, due to its presumed scientific predictive validity, and the inherent drawbacks of teacher made tests. It is often found that the teacher made tests seldom follow the basic rules of test construction, and are hence of poor quality. Other drawbacks of such tests include lack of representation for examining cognitive abilities, non-checking of difficulty and discrimination power, etc. (Carter, 1984; Jandaghi, 2010; Reynolds and Menard, 1980; Stiggins and Bridgeford, 1985; Stiggins, Griswold and Wikelund, 1989). Teacher made testes are also found to heavily rely (at times around 90%) on “recall items” (Carter, 1984). This could be attributed to the lack of experience of teachers in developing questions that help measure cognitive levels of the students (AlQataee, 2014). MacCuish (1986), after surveying over 100 teachers about classroom test design, found that most of them failed to design their tests properly and even evaluate the test responses scientifically. All these point to the definite need and requirement of having scientifically prepared and tested standardised testing tools for college admissions.

Relationship between high school GPA and future academic performance

There are quite a few evidences to show that high school GPA is a significant predictor or performance at the graduation level. While Platt, Turocy and McGlumphy (2001) found positive association among US students; Wharrad, Chapple and Price (2003) found the same association in UK. A similar positive relation was also found in KSA among nursing students by Ayyaf and Magzoub (2014). The same results were found by many researchers (Ali, 2008; Downey, Collins & Browning, 2002 Shulruf et al., 2010; Smithers, Catano and Cunningham, 2004). All these studies were however conducted among medical students.

Relationship between standardized tests and academic performance

There is substantial literature regarding the relationship between standardized entrance examinations and college performance (Alnahdi, 2015; Feldman, 2005; Gropper, 2007; Hitchcock, Onwuegbuzie, and Khoshaim, 2014; Hughes, 1983; McIntosh and Munk, 2007; Rigney, 2003; Sulphey, 2010; Winter and Dodou, 2011). The results these studies are, however, inconclusive and are often conflicting. For instance, Ringney (2003) found that students with high scores in the standardized eligibility scores performed better. An earlier study by Astin (1993) observed that the high school GPA and standardized test scores are predictors of success in university GPA. Another noteworthy study was by Ferguson, James and Madeley (2002). They conducted a detailed review of literature regarding the factors that are associated with academic success. The review, which was limited to medical students, examined the productive validity of selection tests. The study focused on eight criteria under two factors – cognitive and non-cognitive. The cognitive factor analyzed by them was previous academic achievement. The non-cognitive factors were demographics, personality, learning styles, interviews, references, and personal statements. The study observed that there is fairly good correlation between previous academic performance and undergraduate medical training.

A comprehensive study by Bean and Metzner (1985) found that the decision of students’ to drop out of college is based on four variables. This included background factors, academic performance, intend to leave, and external factors. The first variable included the demographics of the students, earlier performance, and their goals and expectations. Academic performance variable included certain aspects like their grades in individual courses, study habits and the major opted by the student at college. “Intend to leave” is a psychological variable, which included commitment of the student to his/her goal, the perceived utility they place of the degree and satisfaction

with the institution. The external factor includes aspects like financial background of the student, family commitments, etc.

As mentioned earlier, inconsistent results have been found in the relationship between standardized admission tests and future academic performance. A number of studies have found the opposite (Feldman, 2005; McIntosh and Munk, 2007; Wright and Palmer, 1997). For instance Feldman (2005) and Gropper (2007) observed only a weak link between eligibility scores and the overall academic performance. Wright and Palmer (1997) found no relationship between the standardized eligibility test scores and academic success of business graduates. McIntosh and Munk (2007) have also opined in the same lines. In a study on Indian population Sulphery (2010) found that there is no relationship between the eligibility test scores and the overall academic performance among business students. Smithers, et al., (2004), on a population of Canadian dental students, found that the effectiveness of the standardized admission test to predict future performance diminishes beyond the second year of study.

Relationship between academic performance and a combination of high school GPA and standardized test performance

Many studies have empirically verified the relationship between future academic performance and the combination of both standardized test scores and high school GPA. Results show that the combination even outperformed either of the one in a consistent manner (Wiley, 2014). A few studies which demonstrated this include Burton and Ramist (2001), Julian (2005), Kobrin, Patterson, Shaw, Mattern and Barbuti (2008), Kuncel, Crede and Thomas (2007), Noble (2003), Stilwell, Dalessandro and Reese (2007). For instance, the study by Kobrin et al., (2008) found an incremental increase in the predictive validity by .08 when the two were taken together. An extensive review was conducted by Burton and Ramist (2001) to evaluate the ability of standardized test and high school GPA to predict future performance. They concluded that a combination of both the scores were capable of making significant and accurate contributions to predict first year GPA, cumulative college GPA, as well as graduation. It was also found that the prediction accuracy was more with the combination of the two either of them. The two are even capable of predicting even certain academic behaviours at college like distinction and other departmental honors.

Significant contribution was made by Kuncel and Hezlett (2007) to this area of research in the form of a meta-analysis. They examined the ability to predict academic performance in both graduate as well as professional college programs. Four key results were found by them. Standardized admission tests were found to effectively predict performance in graduate colleges. A combination of the two was found to predict academic outcomes; over and above the graduate grades at college. The standardized tests predicted were capable of predicting successful performance than college GPA. Another significant finding was that a combination of college GPA and standardized test scores was capable of providing the best accurate prediction. However, these findings were observed for graduate students.

Mattern and Patterson (2011) examined the ability of high school GPA and standardized eligibility tests to predict the retention in the second and third years of college study. The study found that students who, in addition to having standardized test scores, had high school GPA reported correspondingly higher retention rates in the second and third years of their study. However, this study was limited to examining the retention rates and not the academic performance per se.

Saudi studies

A few studies have been conducted in KSA to find out the relationship between standardized test scores and academic performance. Al-Alwan (2009), in a study among health sciences students sample, found that the cognitive components of Saudi GAT exhibited significant correlation with the progress and future academic performance. AlQataee (2014), on a sample of over 5000 students, conducted a study to found out the predictive validity of GAT. Results of the study suggested the predictive validity of the test. However, the sample did not include business students and results of only the first two years of study were considered. The predictive validity of GAT and high school GPA in KSA was examined by Alshumrani (2007). It was found that they both predictors approximately 11 per cent of first-semester college GPA. While GPA explained 10 per cent of GPA variation, GAT could explain only one per cent.

Thus the efficacies of standardized admission tests are still a matter of controversy and debate. Evans (2012) of Stanford University made a prophetic comment when he stated that despite heated discussion over the utility and efficacy of standardized tests for admission to universities, such tests “will continue to play an important role in college admission for the foreseeable future”. This statement seems to be correct, without exception, the world over.

A fair review of literature has found that studies about the relationship between standardized eligibility tests and future academic performance and achievement; especially in business studies are scarce. There is a definite need for such a study. The present study attempts to fill this gap in literature. The result of the study will be of great significance to the academia and educational administrators alike, and will be of interests to professionals in the industry.

4. Research methodology

Data was collected from a sample of 1368 undergraduate business students pertaining to nine academic years of a University in Saudi Arabia. All the students were either graduated or have completed/exhausted the maximum number of attempts/years provided for graduation. Their basic high school qualifications of the sample included specialisations in science, arts and commerce. Details pertaining to high school GPA, standardized eligibility scores and final GPA of the graduated students were used for analysis. They belonged to varied socio-economic status and both genders. The demographics of the sample are presented in Table 1.

Table 1. Demographics of the sample

Particulars		Number	Per cent
High school specialization	Science	1102	80.56
	Arts	248	18.12
	Commerce	18	1.32
	Total	1368	100
Status at the end of the study period	Graduated	181	13.23
	Dismissed/Found incapable	235	17.18
	Withdrawn/Discontinued	952	69.59
	Total	1368	100

It can be seen from Table 1 that the maximum number of students with science (1102 – 80.56 per cent) as major in their high schools has joined the university business program. Students with commerce at high schools were only 18 (1.32 per cent) in number. This shift in majors while moving to college education presents a rather perplexing scenario. Further, Table 1 also presents another disturbing trend. The numbers of students who

graduate are just above 10 percent, with majority either withdrawing or discontinuing their studies in between. While some are dismissed or found to be not fit to continue studies, a large majority of them drop out on their own volition. High dropout rate in Saudi Arabia is definitely a malady that faces the Saudi higher education scenario, which need to be addressed in a war footing (Sulphey, 2017; Sulphey and Alkahtani, 2018). This should not happen given the fact that a large chunk of students join public universities and are often granted scholarships for carrying on their studies. High dropout rates are definitely a serious the world over. It is estimated that in the US though around two-thirds of students who pass out of the high school join colleges, only around 30 per cent go on to graduate after the four-year period. This phenomenon of falling graduation rates is reported to have been occurring since the 1970s (Geisinger, 2014; Hauptman and Kim, 2009; Kamenetz, 2010). Definitely this is an area that needs to be explored to find out the causative factors, so that remedial actions can be taken.

5. Analysis

The descriptive statistics has presented some interesting findings. The mean University GPA of students who studied science at high school was found to be higher ($M = 1.18$ and $SD = 1.346$) than those who studied arts ($M = .90$ and $SD = 1.164$) or commerce ($M = .60$ and $SD = 1.039$). The choice of optional courses by students at high schools need be studied; as to whether they are considering optional based on their own interests, volition and motivation, or are they being impressed upon by family and friends circles.

An attempt was also made to find out if there existed any differences in final outcome of university studies and the standardized admission tests. Towards this ANOVA was done, and there was found to be significant difference ($F = 17.551$) at 0.01 level between those graduated students and those who could not do this due to some reason (dismissed or discontinued) based on the standardized admission test. The Post hoc (Scheffe) also revealed significant difference in the standardized admission test of those who have graduated and the other groups who could not. This shows the discriminating capability of the standardized admission test. The same pattern was also found in the case of high school GPA. The ANOVA results ($F = 61.760$) showed significant difference between the graduated students and those who failed to do so. The pattern with respect to Post hoc was also the same as in the earlier case. This presents that those students who had better high school GPA maintained the same trend with respect to college GPA too.

With a view to find out the relationship between the variables (High school GPA, standardized admission tests and University GPA), and in tune with a number of earlier studies, correlation analyses were done. The analyses have presented some significant results. It was found that significant correlation existed at 0.01 level ($r = .236$ between high school GPA and standardized admission test). These also existed significant correlation ($r = .194$) between the standardized admission test and the overall university GPA. This denotes that there is significant positive relationship between the standardized admission tests score and the overall university GPA. The high school GPA was also found to be significantly correlated at 0.01 level ($r = .237$) with the overall university GPA. These findings are in consistency with the findings of an earlier study by Platt et al., (2001) and another by Al-Alwan (2009) with a Saudi sample. Both these studies, however, were conducted among students undergoing health education. The finding is also in consistency with the findings Ringney (2003), Ferguson, James and Madeley (2002) and Wharrad et al., (2003). Both these findings found that scores of standardized eligibility tests is a definite predictor of success in university GPA. However, all these studies were conducted among health sciences students. Since no other studies have been found to be conducted among business students, this finding is of definite significance and importance.

To understand the predictor power of the individual variables regression analysis was done and the results are presented in the following sections. Table 2 presents the simple and hierarchical multiple regressions.

Table 2. Regression Analysis of Admission Criteria as Predictors of Student Grade Point Average (GPA) at College level

	B	95% CI	P-value
Univariate analysis			
High school GPA	.045	.035 to .056	.000
GAT	.035	.026 to .044	.000
Multivariate analysis			
High school GPA	.039	.029 to .049	.000
GAT	.026	.017 to .036	.000

This model denotes that HS GPA predicts that University GPA increases by .045. Similarly the Generalized admission test predicts University GPA by .035. Multiple regression was done to find out the possible interaction between both the predictor variables and the University GPA. It can be seen that the final model also predicts that the High school GPA and Generalized Admission Test scores are predictors of the University GPA. The ANOVA values in both instances were also significant at 0.01 level, thereby denoting that the regression model is adequate. The above findings are in consistency with the findings of AlQataee (2014), and Ayyaf and Magzoub (2014). However, as stated earlier the present work seems to be the only work which has been done to find out the predictive validity of the HS GPA and standardized admission scores among business students.

Conclusion

Admissions based on standardized eligibility tests have always been a matter of controversy. This has been so in both developed and developing parts of the world. For instance, in the US it is a practice to conduct standardized tests in almost all levels of university education. This system has been criticized for long by academicians and researchers, teacher unions and other civil rights organizations in the US (de Lange, 2007; Hitchcock, et al., 2014), and the public attitude are split about this matter (Bushaw and Lopez, 2012). In the US quite a few civil and grass root organizations see such tests as unfair and discriminatory (Blair, 1999), and have even filed civil suits. Further, students are often pressurised to prepare for the Standardized Admissions tests, whereby they spend hours towards this. Due to this, there are many academic experts who argue that such over emphasis on tests are a compromising and distorting the overall educational system. However, in the absence of a viable alternative, such standardized eligibility tests will continue to be used widely the world over.

Though a number of studies about the efficacy of standardized admission tests have been conducted in the developed world, and quite a few in certain developing countries, only few studies are found conducted in KSA. The study has brought out the complex relationship between performances in eligibility tests and future academic achievement of business students. The present study has also bridged the gap in literature in this regard. It has succeeded in establishing the predictive power of HS GPA and standardized admission scores among business undergraduate students. A combination of HS GPA standardized test scores seems to be the best option for considering students for admission to colleges. Timely modifications of both the examinations based on the changing trends in the education sector will go a long way in making it ideal for selecting students for college admission – at least till another more scientific way of screening students is established. The results of the study have provided inputs for devising strategies to make the eligibility tests and the process of admissions more scientific and professional. The study has also provided educational administrators with valuable insights in this regard. It is expected that further studies, with a higher sample with a wider geographic spread will furthering the results of the study.

Further, a potential area of research is the re-enrolment of dropped out students. The idea stems from the fact that the dropout rate of Saudi students seems to be on the higher side. The aspect of re-enrolment of dropped out students was a matter of study by a number of social scientists and researchers. Studies by Aragon & Johnson (2008); Boston, et al, (2011); Morris & Finnegan (2009) dedicated variables like student characteristics, grades

earned in the courses, number of credits that could be transferred, competency with respect to e-learning environments and course load as predicting the possible re-enrolment of the dropped out students on a later stage. It would be ideal if universities devised appropriate regulations for the transfer of earlier credits, create e-learning environments, blended learning, etc. There seems to be vast potential for e-learning and blended learning platforms in Saudi Arabia in particular and the Middle East and North African region in general. It is hoped that educational administrators do take the required and appropriate steps in this direction. It is also expected and hoped that the present study will act as a trigger for further studies in this line and bring in worthwhile suggestions that would help in better the educational scenario in the region.

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SECURITY OF THE BUSINESS ORGANIZATIONS AS A RESULT OF THE ECONOMIC CRISIS*

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Abstract. Global economic crisis is one of the most significant environmental changes influencing all managerial functions – including entrepreneurs and organization. In this paper, we study how entrepreneurs used organization to deal with the security and sustainability issues stemming from the global economic crisis. Crisis forced managers to undertake various organizational changes that led to a sharp reduction in the number of employees and thus flat organizational structure are the trend among structures. Organization is focused more on designing. One of the newest and fastest growing business trends is the creation of networks and clusters. We conducted research on a sample of 115 foreign and domestic companies running their business in Slovak Republic. We were interested in the perception of lean management, project management and strategic alliances creation during the crisis and in nowadays. We provided an analysis of changes in span of management and managerial level reduction. To analyse the companies, we used descriptive and inductive statistical methods on the lowest possible significance level. Based on our research we found that the optimization of the organizational structure can be the way for helping business companies to overcome economic insecurity in the times of the crisis.

Keywords: organization, entrepreneurship, economic crisis, security, organizational structure, sustainability, lean management, Slovakia

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Additional disciplines (besides field of economics reflected in JEL classifications): leadership, human resource management

1. Introduction

Theory and practice are currently based on years of proven and widely used system framework that divides the structure of management into several basic functions. In the theory of modern management, the division into functions are following – planning, organization, decision making, personnel management, leadership and control. This basic or detailed breakdown is very useful because it offers a solid structure in which new insights can easily be incorporated. The content of features is constantly evolving and responding to changing environmental conditions. One of them is also the crisis which is a milestone, the sudden disruption of the way the business operates. Economic crisis, recession, stagnation, decline - these are the concepts that are still discussed in the mass media, while at the same time they are raising the reflections, concerns over the future. The economic crisis has brought a large number of businesses into difficult situations which have resulted in their fundamental or existing changes in their current functioning. Changes made can also be seen in management functions. The misconception of overcoming the economic crisis lies not only in reducing costs, increasing efficiency and productivity. It is necessary to focus on the future, to better estimate the situation, not to stay in the "wait-and-see strategy", to predict ahead of schedule, to make more effective and more targeted decisions, to provide motivating incentives to employees, to more persistently influence the attitudes of the subordinates, to change the way of managing the company in the long- new management methods that require multiple forms of knowledge acquisition, educational activities, and so on.

In addition to the negative consequences, the economic crisis also presents new challenges, impulses, the need for new solutions and changes in the functions themselves (Abrham et al., 2015). After studying the foreign and domestic scientific and professional literature, we have met a number of analyses and assessments of the impact of the global economic crisis on various macroeconomic indicators. To a very limited extent, these studies addressed issues related to impacts on the management process. This research is largely absent. That is why we have focused on the research of changes in managerial functions that were caused by crisis. In our paper we present the research results in the field of changes in organization that were caused by crisis. We aimed the research on following specific concepts – perception of lean management from the perspective of companies operating in Slovakia. Another concept we paid attention to in the survey was the usage of project management. The third concept we were focused on was the strategic partnerships creation. As a result of personnel effect conditioned by the crisis, the organizational area has seen changes in organizational structure. Organizational structures tended to be slimmed due to letting go of work force. This trend is visible in delayering and other changes in organizational structure that were done to increase the efficiency of business operation.

2. Literature review

Organization during the crisis as well as post-crisis period is an inseparable part of managerial work. According to Hamel, building an organization that is as flexible as much as it is effective is probably one of the most fundamental challenges facing businesses today. Hamel (2006) is of the opinion that the majority of current systems and approaches to management are based on an outdated management principle. For the companies to prosper again in a business environment marked by the consequences of the economic crisis, changes made, and new situations, they must organize less and free the level of management, structuring, hierarchy, and routines. Organizations based on an ideology that preventively and structurally gives power to the minority and takes it away from the majority will have no chance of success in the future. (Grant, 2008)

The economic crisis underlined in specific managerial positions the importance of human resources in the sense of greater engagement in planning, decision-making, creating organizational values, and also in the decentralization of powers (Holagh et al., 2014).

During the economic recession, many managers were forced to undertake various organizational changes that led to a sharp reduction in the number of work forces. Due to decreasing number of employees, organizational structures have been optimized (slimming or flattening) in a natural way. Today, companies are operating with fewer management levels and by delegating greater powers to individual workers. The condition of success of each company is adequate and flexibly corresponding organizational structure. Traditional forms of organizational structures are abandoned with more modern structures coming to the foreground that are marked with strong employee engagement and power authority is transforming into authority based on expertise and knowledge. New organizational structures are linked to new responsibilities, competences, actual work, and systems for measuring system and employee performance (Simionescu et al., 2016). Flat organizational structures are a trend among structures (Morgan, 2015; Kastle, 2013; Janda et al., 2013). A benefit of these structures is especially the adoption of quicker decisions, improving quality and speed of information sharing, strengthening of horizontal communication between employees and a small number of management levels (Nigro et al., 2006; Qi et al., 2014). Organization is focused more on designing (Zálezlková, 2012). It is important for the companies to be able to design projects, because current business environment is characterized by greater uncertainty, frequent changes, post-crisis development that reflected in the emergence of new, thus far unresolved issues and tasks. As a reaction to difficult conditions and new challenges, new projects are emerging and, understandable, the importance of project management (Pinto and Winch, 2016), project organizational structures, and structures based on teamwork is growing. Zagorsek et al. (2017) identified a positive impact of project management and project orientation on competitiveness of a modern company. They also found a relationship between success and companies focused on low financial and material demands. Tarišková (2015) describes the need for the application of balanced scorecards in project management. Mišún and Mišúnová (2017) identified the relationship between organizational structure and control.

Reducing hierarchical structures and redundant management levels prompted interest in the concept of lean - Lean management. Lean management is nothing new in our conditions and it helped many companies to improve performance almost to the world level (Trend, 2016). According to several experts (Burton – Boeder, 2003) (Charron et al., 2015) (Košturiak, 2012) (Georgescu, 2011; Sabic-Lipovaca et al., 2016) the era of worldwide slimming has arrived (for example) in the area of manufacturing (Vilkas et al., 2015), logistics (Jirsák and Holman, 2012; Krejčí et al., 2015), development (Košturiak, 2012), administration (Košturiak, 2012), thinking (So and Sun, 2015), processes (Tenera and Pinto, 2014), or job satisfaction (Čábelková et al. 2015a; Čábelková et al. 2015b). The implementation of lean management requires an interdisciplinary approach, but also a lot of patience (based on Trend analyses (2016) 70% of attempts fails according to conducted global analyses) – it is a long-term culture of constant self-improvement. During the economic recession, companies became more aware of the fact that they cannot afford unnecessary costs in the form of surplus stock, surplus production, or various manufacturing deficiencies, e.g. reduced quality or possible complaints. Because of these and other reasons, companies sought optimization, rationalization and slimming of oversized processes and activities, i.e. eliminating everything that did not bring value to the company with the goal of streamlining processes and reducing costs to the minimum level. We are also witnesses of the creation of Lean Six Sigma (Pamfilie et al., 2012), which is the synthesis of Lean Management and Six Sigma (Dekier, 2012; Tenera and Pinto, 2014). Both methodologies complement each other in order to improve quality, performance, and satisfaction of customers under reducing costs.

Various strategic partnerships are becoming a trend today. The main themes of strategic cooperation are mainly the consequences of the global economic crisis for management and changing economic environment offering

new, more complex challenges. During the economic crisis the companies were searching for new ways how to gain or maintain a competitive advantage. An alternative to addressing the negative consequences of the crisis was the support for creating networks and clusters. The creation of networks and clusters is currently one of the newest and fastest growing business trends. Business networks and clusters are tools, using which companies can resist the adverse impact of the economic crisis and to resume business based on mutual interdependence and cooperation of the clustered entities (Beňová and Szabo, 2016; Razminienė, Tvaronavičienė, 2017; Monni et al., 2017). Other options for eliminating the effects of the recession were to create fusions and acquisitions.

3. Methodology and empirical model

To obtain the desired results we have used the empirical method of observation using a questionnaire survey. The questionnaire was distributed by electronic communication at the beginning of October 2016, whereby data collection was completed in February 2017. 117 questionnaires have been included in the research sample, of which 2 did not meet the relevant completeness, due to which they were not included in the survey. The total number of distributed questionnaires was 370 and the return rate was 31%. Targeted segment of our research was randomly chosen Slovak and foreign enterprises running their business in Slovak republic whereby respondents were members of higher management. Inductively-deductive methods, descriptive methods and Pearson's correlation coefficient were used to analyze collected data. We considered a result to be statistically significant at a significance level of $p < 0.05$.

Authors of many foreign scientific articles described the crisis and post-crisis period as the world-wide slimming era. Companies sought optimization, slimming of oversized processes and activities for the purpose of minimizing surplus costs. We were interested in the perception of lean management from the perspective of companies operating in Slovakia, and therefore given concept became part of our survey.

Table 1. Organization in crisis and in nowadays

	Assessment level				Σ
	1	2	3	4	
	Number of companies				
During the crisis the lean management was applied.	29	26	36	24	115
Lean management is applied in current period.	No		Yes		
	51		64		115
During the crisis we applied more the project management.	23	15	54	23	115
Actually the concept of project management is applied.	No		Yes		
	40		75		115
During the crisis we applied various forms of strategic alliances.	69	26	15	5	115
Actually we apply various forms of strategic alliances.	No		Yes		
	85		30		115

Note: *totally disagree*, 2 – *partially disagree*, 3 – *partially agree*, 4 – *totally agree*.

Source: Own results

Of the aggregated data – see *table 1*, only 24 companies expressed their full approval that they implemented given concept during the crisis. Determined numbers do not have to necessarily suggest the actual situation. It happens that companies oftentimes do not know the management terminology and that they are using this type of management without even realizing the existence of the concept. Of the companies that inclined to lean management, large companies had the greatest share. It was ambiguous to identify in which management areas did the companies implement lean management, since these are very balanced results, see Figure 1.

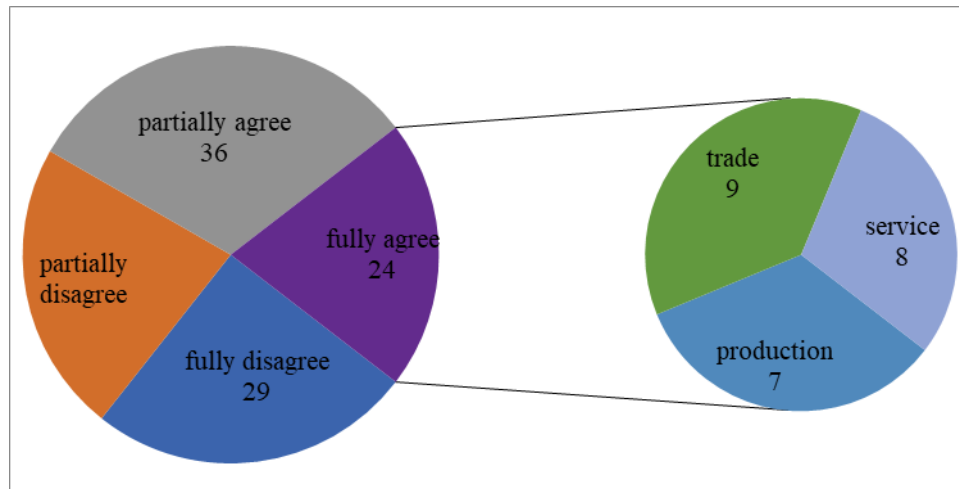


Fig. 1. Lean management in sectors

Source: Own results

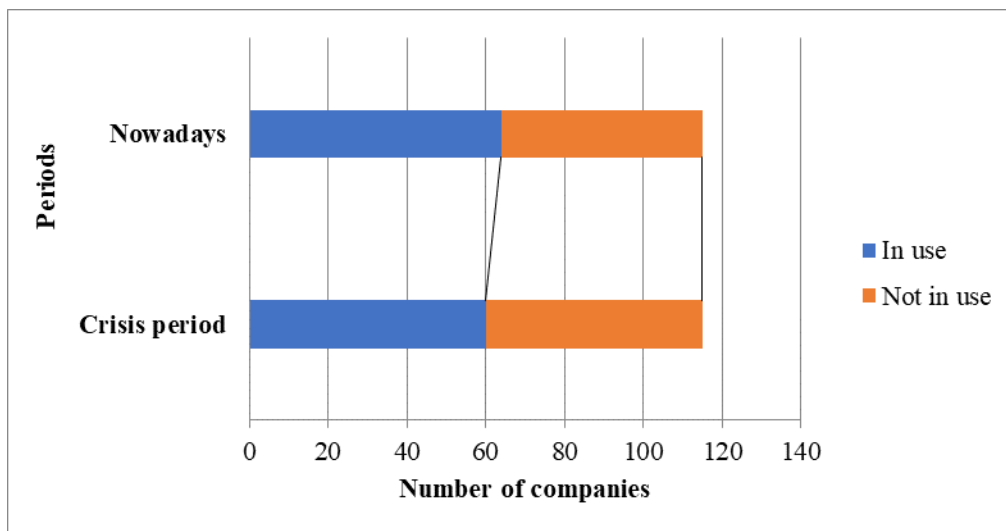


Fig 2. Interest in lean management during crisis and present

Source: Own compilation

Based on comparing the data from the crisis and post-crisis period it can be said that currently more than a half of the respondents (64/115) are using the concept and compared to the crisis period we observe a 6.67% increase (Figure 2). In order not to remain on an unconfirmed assumption that crises increase interest in lean management among companies, we decided to verify it statistically.

In the contingency *Table 2* we compare 2 classification characters A and B, where:

- a_1 , a_2 are the observed periods, in our case the crisis period and the present,
- b_1 , b_2 , b_3 and b_4 are grades, where 1 - totally disagree, 2 - partly disagree, 3 - partly agree, 4 - totally agree.

Table 2. Testing the dependencies between the periods and the level of lean management use

	b₁	b₂	b₃	b₄	Σ	Critical value	
a₁	10,70	2,07	4,01	6,96	23,74		
a₂	13,42	2,59	5,03	8,74	29,79		
Σ	24,12	4,66	9,05	15,70	53,53	>	7,815

Source: Own results

We compared the calculated testing characteristic with 95. percentile χ^2 of the division with $(r - 1) \cdot (s - 1) \cdot \chi^2_{0.95}(3) = 7.815$. Since the square contingency (53.53) exceeds the critical value, we can state that there is significant dependence between the crisis and the post-crisis period in using lean management. The intensity of eliminating any losses and waste in companies is actually affected by the economic crisis.

We used the Pearson's correlation coefficient to assess the contingency intensity rate, in the form:

$$C = \sqrt{\frac{\chi^2}{n + \chi^2}}$$

By using the Pearson's correlation coefficient, we found a moderate dependence between the analysed periods (crisis and post-crisis) and the degree of using lean management. See *Table 3*.

Table 3. Dependence in Pearson's correlation coefficient

Coefficient used	Value
Pearson's correlation coefficient	0,5636

Source: Own results

Another concept we paid attention to in the survey was project management. According to some authors, organizing becomes more designing and because of this the importance of project management is growing. Foreign scientific articles presented the claim that the importance and interest in project management is growing due to the crisis. In case of Slovak respondents there was an interesting situation. Although the theory describes growing interest in given concept, the results of our survey suggest the exact opposite. Currently we can observe a 2.60% decrease of use when compared to the previous period - see *graph 3*. Although the analysis determined a decrease in project solution rate, actually this is a negligible value, because only 2 companies represent the decrease in our case.

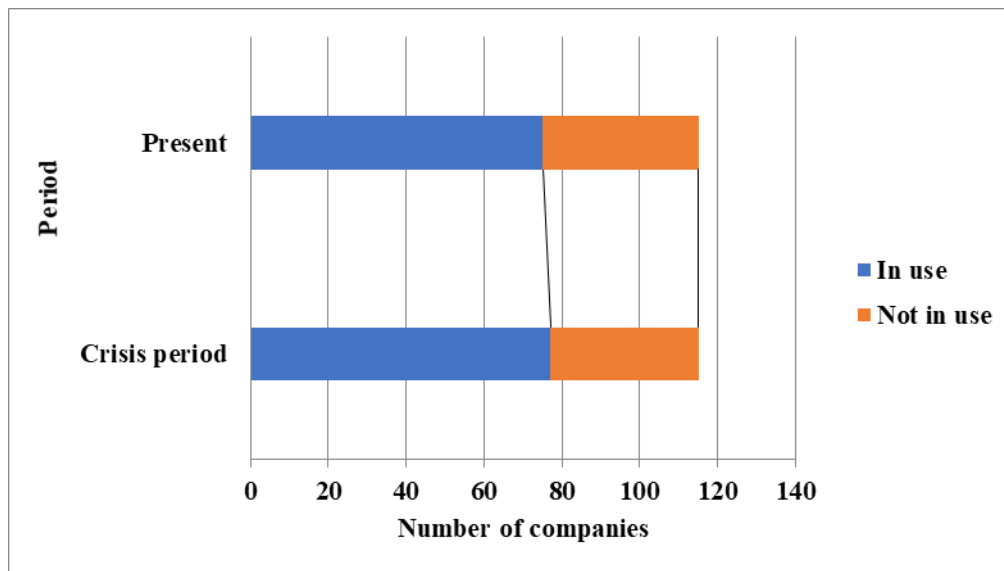


Fig. 3. Interest in project management during crisis and present
Source: Own results

The companies have more negative experience with the economic crisis than positive. Many companies found themselves in an unfavourable situation and in an effort to maintain or increase competitiveness, they began to create strategic partnerships more intensively. Companies in Slovakia do not incline to this “trend”. About 60% of the respondents in our survey confirmed that during the crisis they were not part of any strategic partnership and that only 4% of companies cooperated with other subjects. (see *table 1*) An interesting finding is that these companies have not experienced any impact of the crisis on their business activity. As a result, we postulate that the primary reason for creating these partnerships was not the impact of the economic crisis.

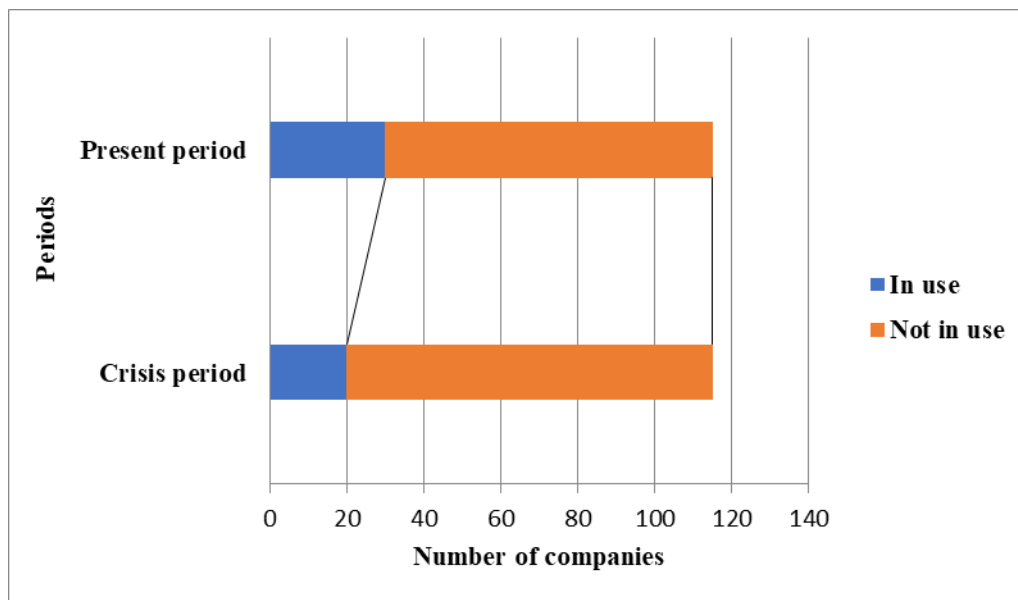


Fig. 4: Interest in strategic partnerships during crisis and present
Source: Own results

Currently, we are seeing an increased number of companies (by about 33%) over the crisis period that cooperate with other companies on achieving their business goal(s) (see Figure 4). Respondents who work in partnerships created after the economic crisis are mainly businesses that characterized the impact of the crisis as negative. In this case we can deduct that the creation of “post-crisis cooperation” was conditioned by a fading situation in the market due to the crisis. We wanted to statistically verify this claim. Our procedure was as follows:

In table 4 and 5 we compare two classification characters A and B, where:

- a_1, a_2 are monitored periods, in our case the crisis period and the present,
- b_1, b_2, b_3 and b_4 are rating levels, where 1 – totally disagree, 2 – partly disagree, 3 – partly agree, 4 – totally agree.

Table 4. Real multiplicity

Oij	b_1	b_2	b_3	b_4	Σ
a_1	6	8	13	3	30
a_2	63	18	2	2	85
Σ	69	26	15	5	115

Source: Own results

When calculating theoretical rates (see table 5), in three cases the conditions for continuing the calculation of statistical dependence or independence were not met. Because of this reason we were not able to continue and we can only state that the growing interest in creating various types of strategic partnerships is conditioned by the creation and course of the economic crisis.

Table 5. Theoretical rate

Eij	b_1	b_2	b_3	b_4	Σ
a_1	18,00	6,78	3,91	1,30	30
a_2	51,00	19,22	11,09	3,70	85
Σ	69,00	26,00	15,00	5,00	115

Source: Own results

As a result of personnel effect conditioned by the crisis, the organizational area has seen changes in organizational structures. These were naturally optimized and slimmed due to letting go of work forces. The purpose of our finding was to find out the average number of subordinates per 1 manager and the average number of management levels. There was no significant change in the number of subordinates. Currently, a manager has 1 worker less than during the crisis period. The decrease can also be observed in the number of management levels, when companies now operate with a smaller number of management levels. The average respondent included in the questionnaire has 3 management levels and the supervisor supervises and monitors the work of 14 workers, see the Table 6 below.

Table 6. Number of subordinates and number of management level

	Pre-crisis period		Present	
	Number of subordinates	Number of management level	Number of subordinates	Number of management level
Ø	15	4	14	3

Source: Own results

According to theoretical source the crisis had an impact on the level of decentralization of decision-making powers at lower levels of management. The dominating answer in the questionnaire results of all monitored organizations is that the impact of the crisis has not been reflected in the delegation of competences to lower levels, nor in centralizing the power to higher levels. Aside from the previous finding, from the results it can be noticed that centralized companies are dominating among the respondents, i.e. higher management levels decide on most issues related to insuring the operation of the business. A slight increase of concentration of competences to higher management levels was especially in finances, marketing, and purchase. It is a natural mechanism when during the crisis companies began to save more and monitor their investments more closely. 6 companies confirmed that due to the economic crisis the human resources area, i.e. for example controlling the extent of meeting the employees' goals is exclusively in the competence of top management. The most significant transfer of decision-making powers was in the area of supply and purchase, i.e. top management delegates' part of its competences to lower organizational units. More detailed results are presented in Figure 5.

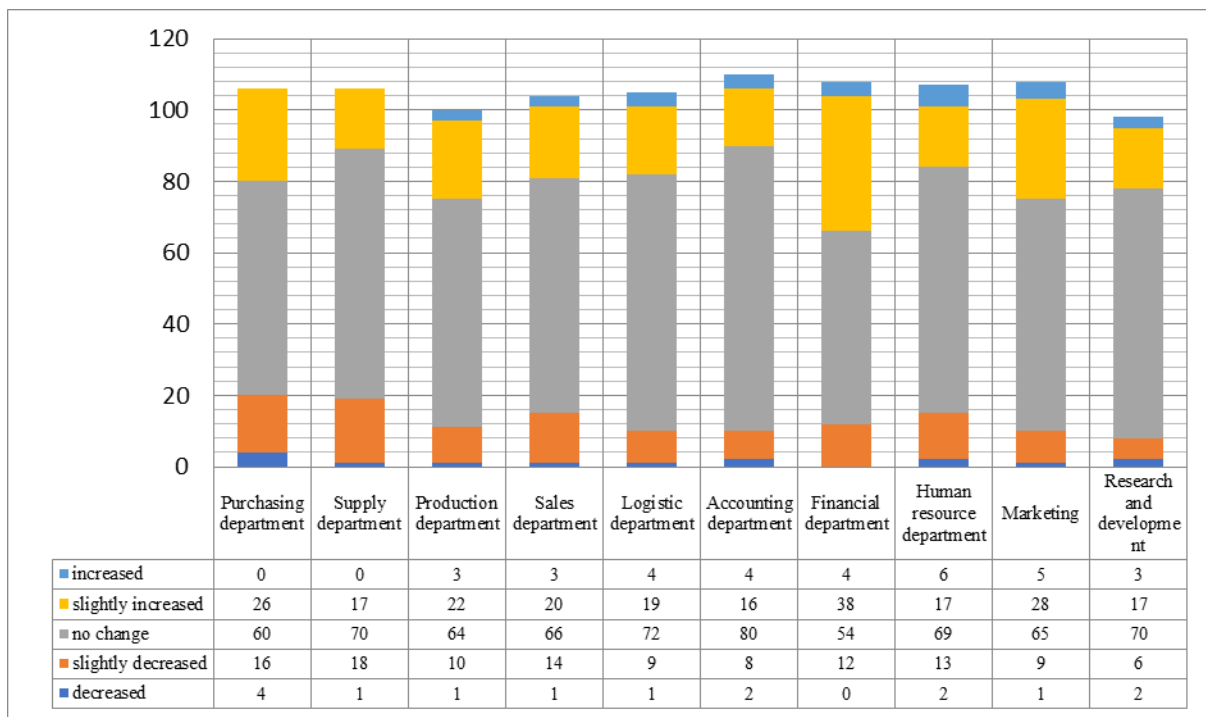


Fig. 5. Changes in centralization of authority caused by crisis
Source: Own results

Companies have expressed a negative impact of the crisis on the organization function. Closer analysis revealed that these are business companies, whose economic development was adversely affected by the crisis, i.e. during the pre-crisis period, majority of the companies were predominantly growing, during the crisis the companies were growing, but also stagnating, and currently they are showing signs of stagnation. Of all the concepts analysed above, only project management has been used and only during the post-crisis period. The number of management levels was reduced by 1, whereby in one case we have recorded a decrease by 2 levels. A more dramatic change happened in the number of subordinates per 1 supervisor. In some companies there is almost a half-drop in the number of workers compared to the period of decline. The degree of centralization was reflected by “increase or slight increase” in all departments they have.

4. Results and discussions

The content of management functions is constantly evolving and responding to the changing environmental conditions. The global economic crisis is definitely one of these conditions. It is a milestone – the sudden interruption of the way the company used to operate. The ability of an entrepreneur to survive a period of economic crisis is mainly in a quick response to a changing business environment and take advantage of the situation as an opportunity for company success.

During the economic crisis companies reduced any unnecessary costs such as surplus stocks, surplus production or various manufacturing deficiencies, reduced quality, possible complaints. For these and other reasons, businesses tended to optimize, rationalize and reduce excessive processes and activities, to eliminate everything that did not bring value to businesses in order to streamline processes and reduce costs to the minimum level. According to a number of experts (Burton – Boeder, 2003) (Charron et al, 2015) (Košturiak, 2012) (Georgescu, 2011), the era of global slimming has begun. In a more detailed analysis, we found that the intensity of eliminating excess processes and activities is affected by the economic crisis. Statistical contingency has been demonstrated. Actually, the number of companies with lean management increased by 6.67% in comparison with crisis period.

According to some economists, the increase of project management importance led to the change in the organization that becomes more designing. Based on the development of tools, the project management has become crucial in achieving business goals. The primary reason for the projects development was the response to a complex business environment and the need to respond to new situations and problems that arose as a result of the economic crisis. Project management implementation discovered many advantages - motivation and engagement of employees, building a project team, strengthening the team spirit, etc. Despite of the above-mentioned benefits of the concept, we are currently following a 2.60% drop in usage over the previous period. This is above all a minimal decline, although respondents are aware of the benefits of project management approach implementation. Theoretical sources inform that more than 65% of respondents currently use the project management in their organizations. Over the last 50 years business practice has shown itself as project management approach brings concrete results to the business. World Project Managers clearly express the increasing tendency of project management approach. Given the post-crisis business environment, pressure on efficiency, performance, cost reduction, quality improvement and risk reduction many more companies will be project-based and not process-driven. (Minárik, 2016).

Enterprises, in an attempt to survive the crisis with minimal consequences, they have been more focused on creating different strategic partnerships. Our results show a growing interest in partnership/membership with other businesses to achieve a common business goal. We have not been able to confirm statistically the increased interest in strategic cooperation, so we can only say that the growing interest in partnerships creation was conditioned by crisis. Currently 30/115 enterprises collaborate with other companies.

Organizational structures have been naturally slimmed up and optimized in times of crisis due to the dismissal, resulting in managerial level reduction. Based on our analysis, we found that companies currently have (on average) 3 levels of management, which represents a 1-point decrease in comparison with the crisis period. Optimizing the organizational structure is an appropriate tool to increase the efficiency of business operations. Our research sample consists predominantly of a centralized type of organizational structures where higher managerial level decides about the majority of all the issues related to ensuring the business operation.

Conclusions

In our paper, we have presented research results on the impact of the economic crisis on the function of organization in company. We state that the crisis had a significant impact on organization methods used by companies.

We have discovered significant dependence between the crisis and the post-crisis period in using lean management. Our study confirmed that currently more than a half of respondents use the concept of lean management and compared to the crisis period we observed a 6,67% increase. By using Pearson's correlation coefficient, we found a moderated dependence between the analysed periods (crisis and post-crisis) and the degree of using lean management.

We state that growing interest in creating various types of strategic partnership is conditioned by the creation and the course of the economic crisis. Companies confirmed more negative experiences than positive with crisis. In effort to maintain or to increase competitiveness, companies started to create more intensively strategic partnership. The increase was by about 33%.

Another concept we were interested in our research was project management. Currently we can observe a slight decrease (2,6%) in use of the concept in comparison with crisis period. As a result of personnel effect conditioned by the crisis, we discovered the changes in span of management – from 15 subordinates in pre-crisis period to 14 subordinates nowadays. We have discovered the decrease in the number of management levels – from 4 in pre-crisis period to 3 in post-crisis period.

The impact of the crisis has not been reflected in the delegation of competences to lower levels, nor in centralizing the power to higher levels for the majority of our respondents. A slight increase of concentration of competencies to higher management levels was especially in finance, marketing, and purchase. The results of our research are both interesting and practical. It opens novel questions about deeper causations of our results that should be explained by using further research.

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FINANCIAL AND ECONOMIC MECHANISMS OF PROMOTING INNOVATIVE ACTIVITY IN THE CONTEXT OF THE DIGITAL ECONOMY FORMATION

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Abstract. The paper analyzes some financial, tax, information, communication, infrastructural, technological and organizational mechanisms of innovative activity promotion in conditions of transition to a digital economy. End-to-end technologies including "Big Data", "New Production Technologies", "Quantum Technologies", "Technologies of Virtual and Augmented Realities", the possibilities of their application in various sectors of the national economy were singled out and analyzed. The role of end-to-end technologies in the development of the Russian economy and promotion of innovative activities of companies was studied. A comparative analysis of the main indicators of informatization of the society of Russia and some leading foreign countries for the period of 2005-2015 was carried out. The conclusions were made about an insufficient use of the Internet in Russia, primarily in rural areas, which hindered the social progress of Russian society. The leading role of digital (information) technologies in solving social problems, including education, social services and healthcare, was defined. The necessity of development of electronic services in the sphere of education and health was proved. Ways of cluster development based on the example of the Kaluga Region in the development of digital technologies were studied. The influence of development institutions on stimulating innovation activity in Russia was analyzed.

Keywords: digital economy; financial and economic mechanisms; end-to-end technology; innovative activity; innovative territorial cluster

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1. Introduction

A required condition for the implementation of innovative activities in the company is the availability of financial resources to ensure the implementation of innovative processes of companies, the process of commercialization of the innovations being created (Ignatavičius et al. 2015; Tvaronavičienė; Černevičiūtė 2015; Zemlickiene et al. 2017; . Innovative activity is a constantly renewed innovation process. There are several main criteria for this phenomenon: innovation activity is directly related to the implementation of research work, which is the initial stage in this process; this activity is characterized by the presence of several stages; there is a transition from scientific developments to practical activities with successful implementation of earlier stages of innovation activity, the stage of commercialization of innovations and their mass distribution; the innovation process is influenced by the processes associated with the formation of the digital economy (Rajnoha et al. 2017; Menshikov et al. 2017; Baronienė, Žirgūtis 2017). The purpose of the work is to identify some financial and economic mechanisms that promote the development of innovative activities in Russia in the conditions of the digital economy. To achieve this goal, the following tasks were identified: to study the features of the development of the digital economy in Russia; to identify the features of using financial and economic mechanisms to promote innovation; to analyze the tendencies of informatization of society, the development of education in healthcare in Russia in comparison with other countries of the world; to study the regional features of stimulating innovation in Russia.

2. Methods

The theoretical and methodological base of the research is based on the works of domestic and foreign scientists in the field of economics, corporate finance, investment and innovation management. During the research, the theoretical and methodological approaches to the development of financial and economic mechanisms for promoting innovation in a digital economy were generalized. In the process of this study, the methods of statistical, coefficient, dynamic, and comparative analysis were used.

3. Result

3.1. Features of the digital economy development and the use of financial and economic mechanisms to promote innovation in Russia

The digital economy of Russia includes the most innovative and technological segments of the market, in which the added value is created using information technology. In 2015-2017, the digital economy in our country accounted for about 3% of GDP, while the growth rate of this sector was 8.5 times higher than the average for the last five years. The ecosystem of the digital economy includes eight sectors: government and society, marketing and advertising, finance and trade, infrastructure and communications, media and entertainment, cybersecurity, education and personnel, and start-ups. Unfortunately, the influence of digital economy on the development of industry, agriculture, electric power and transport in Russia has not been sufficiently studied. The issues of interaction and interrelationship between the digital economy and science have not been worked out. Therefore, the potential of digital economy has yet to be revealed both from the point of view of science and practice. The theoretical basis for the development of the digital economy is the concept of asymmetric information and agency relations. The essence of the concept of asymmetric information is that individuals can receive benefits from owning certain information that is not available to other subjects of financial and economic activity. The concept of agency relationship is the existence of contradictions between the sales representatives of the company and its

owners and this ultimately leads to additional agency costs. In general, the development of information technology will help reduce the severity of information asymmetry due to transparency and accessibility for a wide range of stakeholders. In addition, due to the development of digital technologies, agency costs, related to the need to monitor the activities of sales representatives and the reduction the opportunities for their undesirable behavior, will be reduced.

Thus, the digital economy has turned into a real productive force of society, the driving force behind the development of the Russian economy. Given that the share of the digital economy will account for more than 35% of GDP by 2025, it is important now to provide effective financial and economic mechanisms to promote the development of digital technologies (Federal State Statistics Service; Santo 2005). Innovation activity is a continuous process of consistent work on the transformation of innovations into products and launching it to the market for commercial use. Under the conditions of the Russian reality, innovative activity is confronted with obstacles related to the search for ideas, developing solutions, finding sources of financing, bringing innovative products to potential customers, meeting current obligations, ensuring victory over key competitors and other factors. To overcome the above-mentioned problems, it is necessary to gradually and effectively solve them based on the planning of the innovation process, at each stage of its implementation (Sandu et al. 2013; Steele 1975; Schumpeter 1995; Twiss 2002; Weitzman 1998). To solve these tasks, some financial and economic mechanisms used in the digital economy can help. The most important problem in promoting innovation is providing it with sources of funding. A distinctive feature of financing innovative activity is a variety of sources of financing and the set of various directions of the innovation process in general and its separate objects. The role of credit resources in financing innovative activities of Russian companies is relatively small due to the high cost of attracting them; they are used by no more than 5% of companies. One of effective methods of financing is leasing, which allows obtaining equipment for production without heavy expenses; at the end of the term, the leasing contract can provide for the transfer of equipment rights to the lessee and it usually does not provide for advance payments. It is also possible to single out franchising as a form of indirect financing of innovation processes, which allows cutting costs for the development of production technology, market conquest, advertising, etc.

The sources of funding of innovative processes should be attracted taking into account the following factors:

- cost of attracting the source – the lower the cost of attracting a particular source of financing, the lower the weighted average cost of the company's capital;
- availability of the specific source – a company cannot always take a bank loan to implement its certain innovative projects because of the complexity of its receipt;
- reimbursable or unrecoverable type of financing;
- possible impact of this source of financing on the financial stability and financial condition of the company.

In market economy and in the conditions of the uncertainty of the market environment, it is necessary to look for new sources of financing innovative processes, to select the optimal combination of all available resources for effective implementation of innovative activities.

The classification and characteristics of financial and economic mechanisms to promote innovative activities that are appropriate for use in the regions of Russia taking into account the formation of the digital economy are presented in Table 1.

Table 1. Financial and economic mechanisms of innovative activity promotion while formation of digital economy

No.	Types of mechanisms	Characteristic
1	Financial	Grants' extension from the regional budget; budget investments.
2	Tax	Extension of investment tax credit, tax benefits in terms of amounts to be credited to the regional budget.
3	Information	Information support of the innovation project; electronic services to the public and entrepreneurs; creation of databases, which can be addressed by firms looking for partners in their field of activity.
4	Communication	Consultative support of the innovative project before its payback.
5	Infrastructural	Creation of centers for collective use of scientific equipment for small and medium-sized organizations and research centers.
6	Technological	Creation of network of digital platforms for research in the field of digital economy, the main end-to-end technologies ("Big Data", "New Production Technologies", "Quantum Technologies", "Virtual and Augmented Realities Technologies").
7	Organizational	Determination of the needs of the economic sectors in information technologies, monitoring of research and development, creation of competence centers for expert support of research and development conducted in the country; formation of innovative territorial clusters.

Source: developed by authors

Thus, financial and economic mechanisms for promoting innovation activity include seven sectors – financial, tax, information, communication, infrastructure, technology and organizational ones. All blocks of financial and economic mechanisms are interrelated and represent a complex and multilevel system. The basis for innovation in the digital economy will be the creation of end-to-end technologies, which are key scientific and technical areas that have the greatest impact on the development of new markets and improving existing ones. In the Russian Federation, the most common technologies are manufacturing end-to-end technologies including "Big Data", "New Production Technologies", "Quantum Technologies" and "Technologies of Virtual and Augmented Realities".

The "Big Data" technology is designed to store large amounts of data using domestic media and communication equipment. This technology will contribute to the improvement of information and communication between the subjects of financial and economic activity. The "New production technologies" end-to-end technology includes some groups of technologies for creating products in the digital space, managing the life cycle of complex engineering facilities, managing a scientific and industrial enterprise, digital production, logistics, requirements and quality management, single information space and others. The "Quantum technology" includes quantum computing and modeling, quantum communications and cryptography, quantum frequency standards and quantum sensors.

"New production technologies" and "Quantum technologies" will be most effectively used in the production sector of the national economy (industry, electric power, etc.).

"Virtual and Augmented Realities Technologies" are aimed at software development, hardware creation, information interaction within the digital platform network and electronic trading platform (Program "Digital Economy of the Russian Federation" 2017; Adler 2003; Van den Ban & Hawkins 1996). The use of this end-to-end technology will be most effective in the financial markets and in the financial sector of the Russian economy.

3. 2. Use of information technologies in solving social problems of the Russian society development

However, the transition to the digital economy will allow solving not only economic (increasing the competitiveness of the national economy ensuring sustainable economic growth), but also some social tasks (improving the quality of life of the population, reducing differentiation in the standard of living of rural and urban populations, improving the quality and accessibility of services). It is necessary to give pride of place to the development of the informatization of society, the education and health system (Table 2).

Table 2. The main indicators of the informatization of society, the development of education in healthcare in Russia and other countries in the world for the period of 2005-2015

Indicators	2005	2010	2011	2012	2013	2014	2015
1. Russia							
1.1. Online population, per 100 people	15	43	49	64	68	71	...
1.2. The share of households with the Internet, %	9	48	57	64	69	73	75
1.3. Number of students enrolled in higher education programs, per 1000 people	68	65	61	58	54	51	48
1.4. Population size per 1 physician	...	200	...	...	...	206	218
1.5. Population size per 1 hospital bed	...	107	...	...	...	115	120
1.6. Number of newly reported cases of HIV infection	32,704	57,214	59,592	59,713	63,560	73,538	...
2. Germany							
2.1. Number of Internet users, per 100 people	68	82	81	82	84	86	...
2.2. Share of households with the Internet, %	62	82	83	85	88	89	90
2.3. Number of students enrolled in higher education programs, per 1000 people	...	...	...	...	35	36	...
2.4. Population size per 1 physician	...	269	...	...	...	243	...
2.5. Population size per 1 hospital bed	...	121	...	...	...	122	...
2.6. Number of newly reported cases of HIV infection	2,492	2,714	2,699	2,978	3,288	3,525	...
3. USA							
3.1. Online population, per 100 people	68	72	70	79	84	87	...
3.2. Share of households with Internet, %	...	71	72	75	...	80	...
3.3. Number of students enrolled in higher education programs, per 1000 people	58	66	67	67	63	62	...
3.4. Population size per 1 physician	...	412	...	...	...	392	...
3.5. Population size per 1 hospital bed	...	333	...	...	...	...	...
3.6. Number of newly reported cases of HIV infection	41,129	36,000	35,000	35,000	35,000	...	...

Source: Rosstat: www.gks.ru

Thus, in Russia, the number of Internet users per 100 people, the share of households with access to the Internet compared to Germany and the United States is somewhat lower. The rapid increase in the number of newly reported cases of HIV infection in Russia in 2005-2015 is a matter of great concern – by 2.25 times, up to 73,538 people. At the same time in Germany, these figures are more than 20 times lower, in the US – 2 times lower. In addition, there is an increase in diseases of the population in Russia associated with high blood pressure and malignant diseases. Unlike Germany and the United States, there is a negative dynamics of population growth per hospital bed and one doctor in Russia, a decrease in the number of students enrolled in higher education programs per 1000 population (Twiss 2002; Gokhberg 2017; Association of Innovative Regions of Russia). None above information contributes to the social progress of Russian society, condemning it to degradation and the growth of social inequality.

To improve the situation in the social sphere, some innovative approaches, financial and economic mechanisms are needed. In particular, it is necessary to develop e-services in the field of education and healthcare (online registration for a kindergarten, doctor's appointment, taking information, online consultation, doing homework via electronic media, preventive assistance to the population using the Internet, etc.). This is especially true for rural areas, where there are significant problems in ensuring the accessibility and quality of services in the field of education and health.

When considering the features of innovation processes in Russia, it should be noted that in recent years, companies have become increasingly focused on developing their innovative activity. This is mainly because company executives are fully aware that it is innovation activity in a new market economy that will help companies to develop most effectively. However, there are a lot of unsolved problems in the development of the economy in general and the innovative activity of companies in particular, such as the absence of large innovative companies that are able to give the experience of practical innovation activities to others; the difficulty in attracting financial resources at the stage of introduction of innovative developments due to high cost of commercializing the innovation and the length of the payback period; lack of the necessary regulatory and legal acts that could regulate the conduct of innovation in companies. In addition, many Russian companies lack modern technological base for research. Problems arise in the implementation of commercialization of innovations. They are manifested in the fact that many studies simply do not reach the process of commercialization and remain incomplete, and just a small number of innovative ideas reach production and distribution.

Regional features of stimulating innovation in Russia

Currently, depending on the adopted strategy for the development of the region and the degree of its development, the use of the cluster mechanism can become a priority area of regional innovation policy. It is possible to create either one innovative territorial cluster or a network of clusters. There are some innovative territorial authorities in Russia in the field of information technologies such as "Fiztek XXI" (Central Federal District), "Development of Information Technologies, Radio Electronics, Instrumentation, Communications and Information Telecommunications" (North-West Federal District), Innovative Cluster of Information and biopharmaceutical technologies (Siberian Federal District). Regions that succeeded in creating and developing innovative territorial clusters include the Republics of Tatarstan, Bashkortostan, and the Moscow, Samara and Kaluga Regions (Gokhberg 2017). The second direction (creation of a network of clusters) is a priority for the Kaluga Region, which successfully applies the cluster approach for the development of investment and innovation processes (Weitzman 1998; Association of Innovative Regions of Russia; Porter 1993; Veselovsky et al. 2015).

In 2013, the State Program of the Kaluga Region called "Development of Entrepreneurship and Innovations in the Kaluga Region" was developed, the implementation of which is envisaged in the period from 2014 to 2020 in one stage at the expense of budgetary sources of financing (Table 3).

Table 3. Volumes and structure of sources of financing of the state program of the Kaluga Region called "Development of entrepreneurship and innovation in the Kaluga Region" from all sources of financing

Indicator name	Unit of measurement	Including by years						
		2014	2015	2016	2017	2018	2019	2020
Public funds	thousand roubles	301,632	245,128	173,528	131,095	142,575	144,057	145,528
	%	37.5	51.8	43.2	36.2	38.2	38.4	38.7
Federal money	thousand roubles	502,272	228,000	228,000	230,800	230,800	230,800	230,800
	%	62.5	48.2	56.8	63.8	61.8	61.6	61.3

Source: developed by authors

Thus, more than 60 percent of the funds are allocated from the federal budget. The program provides for the development and approval of a number of regulatory and legal acts of the region that regulate innovation activities.

In 2012, an agreement on cooperation was signed between the Government of the Kaluga Region and OAO Russian Venture Company, which provided for joint work concerning the development of innovative activities, the creation of a venture and 'sowing' investment system in the Kaluga region, and the interaction with other regions of the country. Because of the implementation of the agreement, it is planned to form venture funds in the region, including in the format of public-private partnership.

Thus, the development of innovative activities in the Kaluga region is carried out on a phased basis, in accordance with the developed development strategy. Because of the second stage of the development of this Strategy, clusters should be formed, in which innovative developments will be carried out. The innovative infrastructure of the region, in particular, the development institutions that promote the implementation of innovative activity at all stages of the company's development taking into account the priority development of information technologies in the digital economy should help to form these clusters.

4. Discussion

The problem of financial support of innovative activity is most acute in the development of innovative processes. At the same time, the successful finding of sources of financing innovative processes and their optimal combination can promote the development of innovative processes. The presence of a high degree of uncertainty in the results of research and development, long payback time of investments determine the need to invest a large amount of funds in innovative activities (Federal State Statistics Service; Adler 2003; Köhne 1996).

Developing open innovation, clusters contribute to the accumulation of various participants in innovation, such as federal and regional authorities, development institutions, venture investors, lending institutions, resident companies of clusters and research institutes. These participants, due to their sources, contribute to the financial support of innovative activities of companies within the territorial clusters. Due to the multiple sources of financing within the clusters, the process of diversifying the risks of financing innovative processes of companies is ensured. Because of the gradual reduction of these financing risks, the clusters will become more attractive as

organizational structures that contribute to the most effective organization and financial support for innovation activities (Van den Ban 1999; Buermann 2000; Pogodina et al. 2015).

The need to ensure a successful process of commercialization of companies' innovation is because only this way helps return of money invested in research, development and production of innovation funds. In addition, the complexity of implementing the process of commercialization of companies' innovation in a modern economy is determined by high risks of innovative processes of companies, that is, a long time lag between the development of innovation and its delivery to the consumer, the complexity of implementing the innovation marketing process due to lack of demand for innovative development and inability to find consumers (Santo 2005; Van den Ban & Hawkins 1996; The World Bank 2013, 2012).

Additional difficulties in the commercialization of innovations can arise due to inefficient planning of the innovation process and the lack of a clear system of commercialization of innovations, the development of which should begin at the early stages of the innovation process, namely the stages of the idea of innovation and the development of the concept of an innovative product (service). At present, the resident companies of innovation clusters are assisted in the implementation of the commercialization process by development institutions. The role of these institutions is not only to give financial provision of scientific and technical developments; they also find consumers of innovative developments.

Conclusion

Thus, in the conditions of transition to the digital economy, financial and economic mechanisms are modernized in terms of using end-to-end technologies that will promote innovation in the Russian regions and will improve the quality of life of the population. The impact of the information technology in the development of education and healthcare, social security of the population with quality services is especially significant. In general, the resource and advantages of the digital economy will help solve many of the current problems associated with lowering unemployment, creating an effective public sector, improving the environment, creating innovative companies and increasing the competitiveness of the national economy.

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ENTREPRENEURSHIP AND INFORMATION TECHNOLOGY BUSINESSES IN ECONOMIC CRISIS

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Abstract. This paper aims to identify the importance of Information Technology businesses and youth's interest in entrepreneurial initiatives in connection with IT based businesses. The data was collected using questionnaire from final year students of entrepreneurship and computer sciences enrolled in Bachelors, so as to get a profound picture of their intention, motivation and ability to enter in IT related entrepreneurial ventures. As descriptive statistics was used to analyze the findings, the study depicts great motivation among final year graduates to enter in entrepreneurial ventures. They are found to be motivated to establish ventures of their own even at small level. Therefore, SMEs can play vital role in assisting and fostering entrepreneurial activity with special focus on Information Technology businesses. In addition, the research limitation could be the fact that data has been collected from top universities/ institutes in which intellect level of students is competitively high, thus their liking to entre and understanding regarding SMEs and entrepreneurial initiatives is better than students of ordinary institutes. Also, the results could have been deviated if same research was applied in countries with varying demographics. As for practical implementations, the research may be vital for SMEs officials to foresee the entrepreneurial spirit among youth and to design policies accordingly. Also, it opens horizons for information Technology students to consider entrepreneurial careers other than simply applying for jobs in software houses/ organizations. Also, no prior research has been carried out in analyzing the mutual relation of Entrepreneurship and Information Technology businesses, neither the outcome/ joint effect of both has been studied together

Keywords: entrepreneurship; information technology; innovation, economic crisis; Global Entrepreneurship Monitor

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JEL Classifications: A13, A20, D22, L26, M12, M14

1. Introduction

In the era of worsen economic crisis worldwide where financial institution are merging, industries are being downsized, productions are being minimized, as a response to which inflation is rising at a high pace, unemployment is becoming a world's dilemma, money is losing worth, and in total giant economies are collapsing, there still exists a field/sector or an industry which is ever increasing since the time of its existence and even proving out to be a support to falling economies in this time of economic recession, i.e. Information Technology. Look at one of the biggest business growths in the past two decades and names like Facebook, Twitter, Linked In, Free Lancing, etc. are pretty prominent as far as success is concerned. There was a time when chain stores like Wall Mart, Car manufacturers like Benz and Oil producers like Shell used to be a source of inspiration and still they are but in the recent scenario the shift has been magnificently moved towards the I.T giants, mentioned above. The reason for the very fact is the diversification and advancement in the I.T field as these things point out to an immense research topic I.e. "Entrepreneurial Activity in I.T business is a roadmap to success In Economic Crisis", which is the question raised in this research. Chain stores like Wall Mart and brands like Fiat and shell need great investments and involvement of high risks to be established, which in this vulnerable economic recession could be little undesirable to be taken in to consideration by shareholders (especially the mediocre), that's why this tough era needs to be focused on safe play which is possible in the field of Information Technology, as this appears to be one of the solutions of all the modern economic crisis. To support the argument, take an example of an unemployed person who has the opportunity to do free lancing by sitting at home, where his/ her investment could be less as compared to opening a grocery store in which the risk of losing money is high. Surprisingly, in the situation on hand, even if the loss occurs, it won't be devastating as such if the same failure occurs in home based IT startup. Similarly, if two investors want to have a chain of retail outlets, then their investment is secure if they opt to have business like e-bay, rather than opening giant sopping mart which involves high risk and chances of losing money is more than in e bay, as Wall Mart struggled in Germany and had to shut down its operations (Clark, 2006). Same goes with other comparative businesses as well as I.T related business leaves behind the centuries old established brands listed in NYSE/ NASDAQ (Ausick, 2015).

Having said this all, this research paper focuses on analyzing the point, if modern day youth values entrepreneurship, and what is its perception about IT based businesses as a profitable business ventures, especially to counter worsening economic scenarios worldwide.

2. Literature Review

"Entrepreneurship is the most powerful economic force to mankind" (Kuratko & Hodgetts, 2002). Entrepreneurs are individuals who recognize opportunities where others see chaos or confusion. They are aggressive catalysts for change within the market place. They have been compared to Olympic athletes challenges themselves to break new barriers, to long distance runners dealing with the agony of the mile" (Timmons, 1999).

"Entrepreneurship is more than the mere creation of business and the characteristics of seeking opportunities, taking risks beyond security, and having the tenacity to push an idea through reality" (Kuratko & Hodgetts, 2002).

"Entrepreneurship is the symbol of business tenacity and achievements". The entrepreneur is the aggressive catalyst for change in the world of business. He or she is an independent thinker who dares to be different in a background of common events. The single definition of entrepreneurship doesn't exist considering the openness and depth of entrepreneurship as a concept. Yet, there are some similarities in its literature review which includes personal initiative, the ability to consolidate resources, management skills, a desire for autonomy and risk taking. Other characteristics include competitiveness, goal-oriented behavior, confidence, opportunistic behavior, intuitiveness, reality-based actions, the ability to learn from mistakes and the ability to employ human relations

skills, ability to undertake certain risk and make decisions in conditions of uncertainty (Kuratko & Hodgetts, 2002; Michailova et al., 2017).

As (Rossmiller et al., 2017) describe the failure of conventional SMEs potentially due to lack of usage of technology aided systems rather stressing more on business operations, there must be emphasis on entrepreneurial intellect in the field of technology as well. Also, as per (Johannesson & Jorgensen, 2017) findings, there is a positive and significant impact of firm's intellectual resources (in terms of professional employees and skilled workers) on entrepreneurial orientation. Moreover, the size and other characteristic features of the start-ups firm is another aspect to be considered (Tvaronavičienė, 2016).

(Cockburn et al., 2000) consider the use of technology in business as one of the changing trends in the era of hyper business and commercialization. In the start of business, entrepreneurs use their technical knowledge as a vibrant resource to overcome resource shortage (Shane, 2008). Reinganum (1983) earlier states that technical innovation and hypothetical suggestion makes difference in competitive innovation. As following innovation is one of the basic characteristics of a successful entrepreneur, it could be beneficial to indulge technology in the ventures.

Shane (2008) relates the technology with three dimensions. These dimensions consist of limited technology, excess of knowledge and intellectual property which entrepreneurs have yet to practice to their full potential. Since entrepreneurs are calculated risk takers, these above mentioned dimensions may affect the risk in business, if executed accordingly. As opportunity and risk go hand in hand, and opportunity is creating or developing goods or services based on uniqueness (Shane, 2012), it's the information technology or in more simple words information-based technology that may guarantee unique products and services, and once the unique product services are developed there is a huge chance of success as compared to when conventional/ traditional product or services are developed.

Talking about historical views on entrepreneurship and economic growth Carree and Thurik (2008) have provided bases for extensive relationship between entrepreneurship and economic growth. This signifies the fact that entrepreneurship affects the economic growth by fostering innovation, creating competition which in turn raises the competitive rivalry. However, it is proven from early literature in 80's that entrepreneurship may play a pivot role in long term economic growth (Lazonick, 1991) which shows that study needs to be moved on from discussing conventional entrepreneurial initiatives to E Commerce and from E-Commerce to M-Commerce which has been stressed in this study. Earlier Wenekers and Thurik (1999) has already constructed an operational framework showing relationship between entrepreneurship and economic growth, therefore need is to focus on the new means as and an ever-increasing demand of entrepreneurial activity.

Bringing economic effects in to discussion empirically, a survey by Storey (1991) validates the unidirectional impact of unemployment on firm start up. Also, the creation of new employment opportunities by starting new ventures has been found by "Schumpeter" effect (Manser & Picot, 1999). As this study also aims to pinpoint the motivation of students starting own businesses, previous literature by Evans and Leighton (1989) and Reynolds (1999) have already discovered refugee and shopkeeper effect, according to which unemployed individuals prefer self-employment. However, as Van Stel and Storey (1994) talks about refugee push effect in which entrepreneurship may result in self-employment but may not generate any growth, therefore the effort is to find out areas where entrepreneurial growth is highly anticipated and that is the question which is raised in this study.

So, in the light of established theories I.e. neo-classical (Solow, 1956) and endogenous (Romer, 1986) models of economic growth which admit the role of technological innovation in economic growth, the literature is further expanded to discuss Global Entrepreneurship Monitor (GEM). So, continuing secondary research forming strong basis for the study, the table below is comprised of official data from Global Entrepreneurship Monitor which reveals important insights about countries' performance regarding necessary entrepreneurial factors for the respective years. These factors include TEA which accounts for "Total Early Stage Entrepreneurial Activity" and mentions the percentage of entrepreneurs for newly established ventures with their age ranging from 18-64. The

second factor “Established Business Ownership represents” owner-managers of the established business from which salaries are being paid for more than 42 months. The third factor i.e. “Perceived Opportunities” show the percentage of population who foresee business opportunities in the area they live. The next factor which is named as “Perceived Capabilities” represents the age group from 18 – 64 which believe they have the required skills to start new venture. Next in line is “Entrepreneurial Intention” which reflects intention of people to become entrepreneur in next three years. The last of the factors is titled as “Fear of Failure” which indicates the percentage of people whose fear prevents them in establishing a venture. It is also noted here that these factors represent individuals with age range from 18 to 64 (Table 1).

Table 1. Global Entrepreneurship Monitor – Country Profile

PAKISTAN – Key Indicators 2012	USA - Key Indicators 2014
TEA: 11.6% Established Business Ownership: 3.8 % Perceived Opportunities: 46% Perceived Capabilities: 49% Entrepreneurial Intention: 25% Fear of Failure: 31%	TEA: 13.8% Established Business Ownership: 6.9% Perceived Opportunities: 51% Perceived Capabilities: 53% Entrepreneurial Intention: 12% Fear of Failure: 30%
LATVIA - Key Indicators 2014	NIGERIA - Key Indicators 2012
TEA: 13.3% Established Business Ownership: 8.8% Perceived Opportunities: 35% Perceived Capabilities 23% Entrepreneurial Intention: 23% Fear of Failure: 42%	TEA: 35% Established Business Ownership: 15.7% Perceived Opportunities: 82% Perceived Capabilities 88% Entrepreneurial Intention: 44% Fear of Failure: 21%
INDIA – Key Indicators 2014	UNITED KINGDOM – Key Indicators
TEA: 6.6% Established Business Ownership: 3.7% Perceived Opportunities: 39% Perceived Capabilities 37% Entrepreneurial Intention: 8% Fear of Failure: 38%	TEA: 8.6% Established Business Ownership: 6% Perceived Opportunities: 37% Perceived Capabilities 38% Entrepreneurial Intention: 8.5% Fear of Failure: 43%

Source: Global Entrepreneurship Monitor, 2016

The table above shows immense variations and make this research an important step in proving a point that Countries though with less GDP comparatively possess vibrant lot of youth and individuals who foresee to establish their ventures depending upon the resources, if provided. Comparing USA with Pakistan, we see the fear of failure factor with 30 and 31% respectively, is the same but Entrepreneurial Intention is almost double in Pakistan than USA, whereas USA is almost doubled in established business ownership score which is why an entrepreneurial oriented economy is observed in United States. Same goes with promising scores for United Kingdom however, very high fear of failure value is a need to address for UK nationals. India looks pretty low in Entrepreneurial Intention feature which could be due to immense population it carries or it’s about people looking for provision of basic facilities in numbers. This point also entails economists to redefine countries’ prosperity or economic growth factors other than its GDP scores. Contrastingly, Latvia with low population has mature TEAs value and Entrepreneurial intention is high also but again high FOF value is a case to look at. Taking Nigeria into consideration, all the scores are on higher side with low FOF value indicates that Nigeria being denser in population has understood the importance of entrepreneurial initiatives and on provision of Government assistance it can excel following the Chinese model of economy. Considering other side of the picture, the evaluation of scores lead us also to analyse that countries with high perceived capabilities and having high fear of

failure could be for the fact that people in those countries are already enjoying basic facilities of life with no major differences in income distribution or that they lie somewhere in second or third quadrant of Maslow's Hierarchy of needs that's why going for any business adventure increases their fear for losing what they already have. Also, there can be many factors that can be linked with the analysis of this table which may include religious element as well as individuals even with little availability of resources take business plunges while leaving the outcome/ future of the initiative on fate. So, as said above this very table can be discussed with many angles. However, as the data has been collected from Pakistan youth, this study could be an important input for GEM authorities for provision of some future statistics for Pakistan, as it lacks the current data

3. Research Methodology

It is defined as a highly intellectual human activity used in the investigation of nature and matter and deals specifically with the way data is collected, analysed and interpreted (Holman, 2005)

The objective of this research is to

- Identify the importance of Information Technology businesses among business & IT graduates
- Analyse the motivation of youth in initiating entrepreneurial ventures

Questionnaire and Sample

The questionnaire has been tailored while keeping in view data in the Fig 1 below, which is based upon quantitative techniques. A sample of 50 students with proportion of 63.8 male and 36.2 % accounts for female having age group from 20 to 24 years old, was taken using Google forms. The respondents were final year Bachelor students from renowned University of Pakistan from disciplines of computer engineering, computer sciences, marketing and finance. To achieve statistical extractions, descriptive analysis has been used to overview the level of respondents' motivation and capacity to start entrepreneurial ventures in connection with Information Technology based businesses.

Excerpts from the Questionnaire

As discussed above that the questionnaire was designed to analyse the Information and importance of IT based entrepreneurial ventures, the motivation and the financial capability to start own enterprise, find below few of the questions with likert scale as an excerpt (Table 2).

Table 2. Excerpts from the questionnaire

Information and Importance of IT Based Entrepreneurial Ventures	Scale - Likert					
Information Technology can act as catalyst to economic growth	1	2	3	4	5	
Entrepreneurial ideas in the field of IT can assist declining economies	1	2	3	4	5	
Motivation to start own Enterprise	Scale -- Likert					
I aim to establish business of my own in future	1	2	3	4	5	
I would like to start a business in the field of IT	1	2	3	4	5	
Capability to Start Own Business						
I have finances to establish medium size venture	1	2	3	4	5	
I can apply for bank loans for investing in mega business projects	1	2	3	4	5	

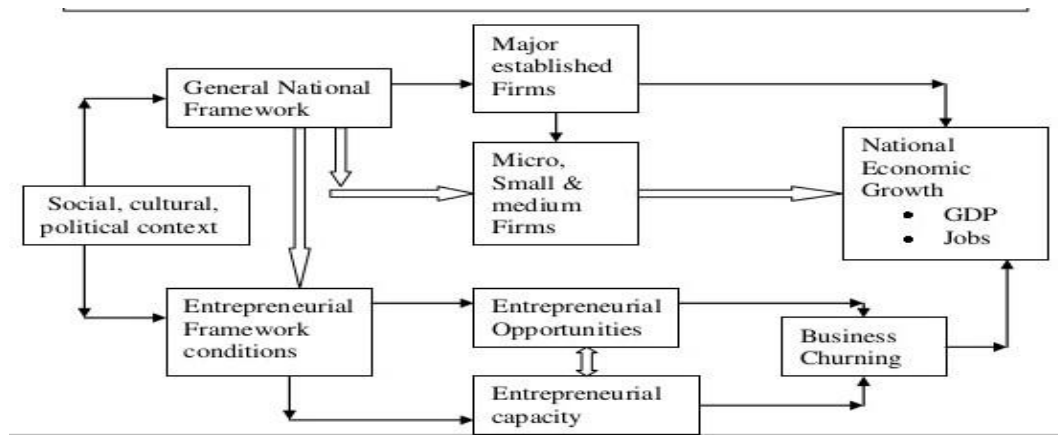


Fig.1 Gem conceptual model of economic growth
Source: Global Entrepreneurship Monitor

As Global Entrepreneurship Monitor framework of economic growth has been used as guideline to this study, it signifies the fact that it's social, cultural and political affiliations which effect entrepreneurial initiatives amongst people. These factors lead to exploit entrepreneurial opportunities which with the combination of entrepreneurial capacity lead to business churning. This is the point where this research signifies this model in terms of questions asked from respondents which are divided in following parts I.e. Entrepreneurial motivation & entrepreneurial capacity and the effect of both on economic growth. The answers from the respondent will not only show the relativity with the model but also give an insight about importance of IT business in edging GDP growth, especially in the context of economies which may show fluctuations.

4. Findings and Discussions

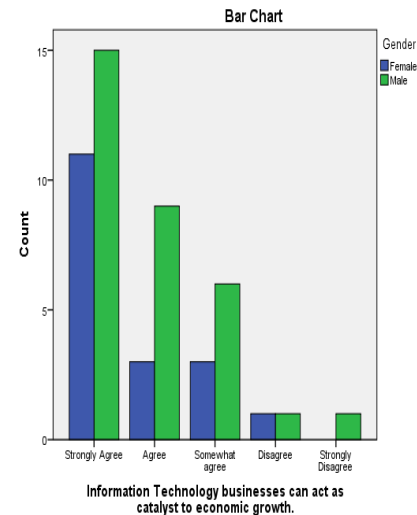
Table 3. Cronbach's Alpha Test of Reliability

	Cronbach's Alpha Based on Standardized	
Cronbach's Alpha	Items	N of Items
.738	.749	12

Since the value of Cronbach's alpha is greater than 0.7 (see Table 3), the data and score pass reliability test comprehensively.

Table. 4 Descriptives for Information and Importance of IT Based Entrepreneurial Ventures – Results

	Entrepreneurship can foster economic growth.	Information Technology businesses can act as catalyst to economic growth.	Entrepreneurial ideas in the field of I.T can assist declining economies.
Mean	1.680	1.800	2.680
Std. Deviation	.9355	1.0102	1.2526
Variance	.875	1.020	1.569



Evident from the results (Table. 4) the above portion of questions is targeted at respondent's view on entrepreneurship and IT and the results show their belief that entrepreneurial ideas, more specifically IT based ventures are a must for economic growth. The key thing to remember here is the gender mix of respondents thus verifying female's interest in entrepreneurial initiatives which could be beneficial for economies in which females have yet to take professional assignments. Their role in IT oriented business may pave a way for them to initiate home based business by just maintaining a perfect balance between family and professional life.

Table. 5 Descriptives for Motivation to start own Enterprise - Results

	Over the years, I.T based businesses have flourished interestingly	I have knowledge of both entrepreneurship and I.T.	I aim to establish a business of my own in future.	I would like to start a business in the field of I.T.	I am inspired by the successful businesses like Face book or Freelancing.	My family or relatives comprise of businessmen and entrepreneurs.
Mean	1.800	1.900	2.140	2.200	2.020	2.940
Std. Deviation	1.0880	1.1294	1.1954	1.2617	1.3323	1.2521
Variance	1.184	1.276	1.429	1.592	1.775	1.568

The above set of questions (Table. 5) shows respondents' motivation for new start-ups. Here it is obvious from the results that not only the respondents are highly motivated to establish their new businesses, despite being in their last semester and are in job hunt process, but they are also inspired by successful business ideas like Facebook or Freelancing. The results of question vowing for their liking for IT related business also meet one of the objectives of the study I.e. "importance of IT related businesses".

Table 6. Descriptives for Capability to Start Own Business

	I have finances to establish a medium size venture.	I can arrange big budget to establish a high scale business.	I can apply for bank loans for investing in mega business projects.
Mean	3.220	3.820	3.500
Std. Deviation	1.3445	1.3045	1.2817
Variance	1.808	1.702	1.643

The last few questions (Table 6) depict capacity of respondents whether if they can arrange or possess finance to establish their own setups and unfortunately the results are pretty alarming as highest percentage of respondents lie in the strongly disagree/ disagree column. Along with the shortage of funds the respondent's trust on banking sector in terms of obtaining loans is also on the lower side which is not a good sign, as banks and financial institutions are essential part of positive economic activity but these results; for whatever the reasons, are just not desirable thus opening a room for banking sector to take measures to win people's trust. Considering these findings, previous studies have discussed the impact of Entrepreneurial ventures and their impact on economic growth directly but research on initiation of IT based businesses to foster SME growth is very rare. As (Ezuma & Ismail, 2017) discuss the role of entrepreneurship and its direct effect on growth, (Coleman & Robb, 2018) also elaborates the role and effect of women entrepreneurship. So, the results in this study takes entrepreneurial research to next extent as it throws light on the role of IT oriented ventures; while further adding the phenomenon of business and IT graduates as well.

Recommendations and Suggestions

Based on the results it is therefore recommended that

- Government should foster SME growth to ensure economic development through efficient policy making to edge economies with low Per capita income.
- Entrepreneurship should be made a compulsory subject to be taught in all the disciplines wherever it may fit in e.g. engineering, medical and fine arts etc., if appropriate. This practice is common in European Countries and should be adopted by other countries as well.
- As mandatory in advanced western countries, measures should be taken to foster women entrepreneurship by Government, media and civil society as well.
- Banks should provide entrepreneurial funds/ loan to young pass outs on realistic terms. The need is to formulate the customer oriented and practical terms, so that needful be given opportunities to secure lone also.
- Universities should encourage student entrepreneurial attitude both monetarily and intellectually. Further, creating an enterprise accelerated cell by the universities/ institutes can be a worthy move.
- Information Technology orientation should be enhanced on day to day purchase transactions. As mentioned in results about increasing liking and interest of customers in IT, this move may further track their mind and opinion towards IT oriented businesses.



Conclusion

This research takes us to conclusion that the current youth has surely got a business mind and possess huge motivation to start its own ventures. A good prospect is that students are not earning degrees only as they consider entrepreneurial ventures an effective tool to increase their earnings. Their motivation is high, and they are also impressed by the recent IT giants thus considering information technology businesses an economic booster that can edge declining economies. This takes us further to conclude that establishing an IT based business based upon computer aided systems and methodologies may not only bring innovation but also guarantees more returns in contrast to less investment which otherwise would have been required in traditional businesses of same level. So, its high time for investors to bring SME sector in perfect alignment with IT based business. Since, banks' aid is important for financing the start-ups, it is mandatory for them to make policies and procedures that allow prospect enterprise to accord with the financing options. In total, it won't be wrong to comment that there is great need to focus on IT based businesses to cope with the worsening economic scenarios, especially when there is great interest and motivation among the youth to start IT based businesses as this is the same youth which is termed as future of any country.

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VISUALIZATION OF EXPRESSING CULINARY EXPERIENCE IN SOCIAL NETWORK, MEMETIC APPROACH

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Abstract. *Objectives:* The scientific aim of the study was the implementation of the assumptions of tourist experience formation model according to Quan and Wang (2004) in the context of meme theory (i.e. carriers of cultural information, Dawkins, 1976) for evaluation and visualization of the expression of regional cuisine culinary experience by social network users. The quality of culinary service influencing consumer's experience is equal to memetic transmission forming and broadcasting. Such type of transmission is acquired and decoded by consumers for further expression, i.a. through social networks. According to meme theory, the formation and expression of culinary experience is the building of memetic maps described by the frequency of the appearance of certain memes. *Data and methods:* Research included ten catering facilities, serving dishes of the regional cuisine (Polish, Belarussian, Ukrainian, Lithuanian and Tartar), located in the Podlaskie Voivodeship and having an active profile in Facebook social network. 370 comments were considered from the period between May and September 2016, referring to the contents connected only with the culinary offer of the facilities taken into account. The quantitative and qualitative content analysis was performed. The classification of emotion according to Xu et. al (2015) was used in the semantic decomposition of posted comments. Positive (enjoyment, confidence, safety, positive associations) and negative (dissatisfaction, distrust, anxiety, lack of positive associations) content of posted comments referred to the decor of the inside (mechanic factor), the quality of service (humanic factor) and served dishes (functional factor) were distinguished and analysed (Wall and Berry, 2007). *Results:* The analysis of the obtained meme maps suggests the presence of positive relationship between presence of memes of holistic enjoyment and enjoyment associated with regional dishes ($r_s=0.67$; $p<0,05$). Similar relationship was observed between sense of enjoyment as well as the formation of positive associations with regional cuisine ($r_s=0.67$; $p<0,05$). Expression of anxiety is also highly connected with the negative perception of food quality ($r_s=0.65$; $p<0,05$). *Conclusions:* Meme theory is an effective and useful framework for social media content analysis. The study had utilitarian character. Results can be used for the establishment of a system of the recommendation towards improving the quality of regional cuisine culinary services.

Keywords: social network; user generated content; memes; meme transmission; culinary experience

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JEL Classifications: D09, Z19

1. Introduction

The gastronomy and culinary base play an important role in creating the economic development of the destination (Hall, 2012; Jurigová et al., 2017). The Author argues that food consumption is integral to tourism and its economic impact can be important not only for immediate businesses that directly provide food for tourists (such as hotels, restaurants and attractions), it can also have significant economic impact throughout the food supply chain. The author claims that food tourism can be linked with other visitor products such as cultural and natural heritage attractions, thereby providing a comprehensive offer.

Regional cuisine is also the cultural expression of destination image. Baloglu i McCleary (1999), suggest that the cultural elements are next to nature and the overall experience, the fundamental factors shaping the image of the destination, it can be said that the local cuisine is one of the elements of destination expression, and thus is one of the most important distinguishing features of the image of a destination. These are also the elements that affect the emotions of the recipient.

A tourist trip is the sum of experiences, where the culinary experience is only one of the elements of a holistic tourism experience. Quan and Wang (2004) suggest that cooking - including local, site, region, or area-specific cuisines - are among the basic building blocks of experience related to a destination. Thus, they reflect on the satisfaction from the trip, directly influencing the "lasting memory about the experience." Thus an associative network is created between the meanings (knowledge), referring to the essence of the destiny (Conner et al., 2017, Erjavec et al., 2016). Berger et. al. (2004), using the approach of associative networks, define knowledge as "semantic relationships between domain-intrinsic information items". This approach is consistent with meme theory (Dawkins, 1976), i.e. replicators of cultural information. The scientific goal of the work was to implement the assumptions of the meme theory for the purpose of analysing the culinary experience externalized as the content of social networks. The utilitarian goal was to develop theoretical assumptions for the recommendation system, creating and presenting culinary products, i.e. creating descriptions and product images taking into account the perception of users.

2. Literature overview

Kaplan and Haenlein (2010) have defined social media (SM) as a tool usable for creation and sharing the User Generated Content (UGC). The typology of SM including: media sharing platforms, review sites, social networks, blogs, wikis (Gandomi, & Haider, 2015, Potkány, & Hajduková, 2015). All of these types of social media "rely on user-generated content provide their users tools to contribute data, whether through a profile, video, comment, or other means" (Silva and Panahi, 2017). UGC is perceived as content created and shared by social media users for other social media users. It is the richest source of information about experiences, behaviours, attitudes, lifestyles, opinions and feelings of their authors. Luca (2015) indicated the most popular types of UGC. It was as follows: pictures, personal updates and networking, reviews for products and services, encyclopaedia and reference sites, videos, payments, comments, etc. Such types could have different emotional character. In the case of posted comments, their semantic content could be perceived as positive, neutral or negative sets of emotions (Xu et al. 2015). Simultaneously such positive, neutral or negative expression of attitudes could be referred entirely or partly to phenomena, product or service. Wall et al. (2007) in the case of culinary service suggest that „diners use the following types of clues to judge a restaurant experience: functional—the technical quality of the food and service; mechanic—the ambience and other design and technical elements; and humane—the performance, behaviour, and appearance of the employees.” Such approach is common with systemic perception of service quality and taken into account (Urban, 2007 based on: Lehtinen and Lehtinen, 1991 and Johnson et al. 1995):

- quality of input: among others attributes concerning service personnel, interior and equipment;
- quality of process: among others, courtesy and friendliness of the staff, quality and aesthetics of the food served;

- quality of output: contains mental changes resulting from the use of the service.

The formation of changes in the mental state of the recipient justifies the memetic approach.

Memes are the replicators of cultural information (Dawkins, 1976). According to Shifman (2013), memes have a few basic attributes:

Content – part of the text, an image or a fragment, or any other form of a communication and the meaning, which it – (information transmission);

Form – nature of visualization / manifestation of a communication in the form of text, images, melodies;

Stance – concerns the relationship between the sender and the message content as well as the form and its recipient, the relation between the addresser, the information content and form, and of course the addressees.

Memes, analogous to genes, compete with each other for existence in the population. The memes having the greatest chance for dissemination and survival are the ones characterized by, inter alia, efficient duplication, faithfulness of message, copy durability (Boski, 2010). It is possible to visualize the incidence of memes by creating meme maps. A meme map is also a visualization of the mental construct, which expresses the way of perceiving a particular phenomenon (Atadli et al. 2017). Henderson (1998) suggests that simultaneously it is the expression of individual pattern of individual's reality perception manner. It was referred to all aspects of human activity, including product experience. Hekkert & Schifferstein (2008) defined the product experience as 'the awareness of the psychological effects elicited by the interaction with a product, including the degree to which all our senses are stimulated, the meanings and values we attach to the product, and the feelings and emotions that are elicited'. According to Quan and Wang (2004), tourist experience is influencing by tourist expectations and product performances and tourist satisfaction. The quality of food is decisive for tourist satisfaction as well as for holistic tourist experience, when food produces "lasting memory of experience".

3. Materials and methods

The work was carried out using quantitative and qualitative analysis methods. It has been assumed that the comments left on the regional profiles of the restaurants are a direct expression of the culinary experience. It may have a negative or a positive impact. This experience is also of a memetic nature. Memes are created (are received) at the stage of service consumption, cause mental changes in the recipients, and can be transferred and / or expressed. The expressions of mental changes are included in the comments in the form of various emotional meanings (memes) relating to a specific aspect of the service, i.e.: functional, mechanic and humanic elements of culinary experience" (Wall et al. 2007). These memes occur with different frequencies, thus creating a meme sub-pool relating to the manner of perception and expression of culinary experience. The semantic decomposition of comments allows to isolate the individual elements of experience and to visualize them. At the same time, it is possible to indicate the source of the factor to which the relevant element of experience relates (functional, mechanical and human factors of culinary experience).

The object of the study were comments left by the users of the Facebook social network, and left on the official profiles of the restaurant in the region of Podlasie, offering regional cuisine. The modified methodology according to (Marine-Roig and Clavé, 2015) was applied, which including:

1. Facebook profiles selection (analysed profiles, founded using Facebook search engine with using keywords: regionalna kuchania podlaska (regional podlaskie cuisine) referred only to restaurants; the profile were selected when possess more than 30 posted comments related to the culinary experience);
 2. data collection (founded comments were downloaded and archived);
 3. data pre-processing (including content mining which extracting based information about authors of each comment);
 4. content analysis (semantic decomposition of each comment according to criteria shown on Fig. 1).
- 370 comments were taken into account, 500 posts were gathered in the course of the study, shared by the administrators of the profiles and relating directly to the culinary service alone. The comments not related to cuisine were omitted. The details are presented in Table 1.

Table 1. Object of the study

Name of the establishment	Profile address	Number of posts analysed	Number of comments included
Babka Białystok	www.facebook.com/Babka.Bialystok	50	50
Restauracja Stoczek 1929 Białowieża	www.facebook.com/Stoczek1929	50	50
Abro Kuchnia i Bar Suwałki	www.facebook.com/abrobar	50	30
Folwark Nadawki	www.facebook.com/Folwark-Nadawki-246555872059819	50	30
Karczma Polska Suwałki	www.facebook.com/karczma.polska.11	50	40
Tatarska Jurta Kruszyniany	www.facebook.com/Tatarska-Jurta-589059724453980	50	40
Galeria Sztuki i Smaku "Opowieści z Narwi"	www.facebook.com/Galeria-Sztuki-i-Smaku-Opowieści-z-Narwi--671574376265133	50	30
Restauracja "U Ireny"	www.facebook.com/Restauracja-noclegi-U-Ireny-w-Drohiczyne-174873735905837	50	30
Wiszące Ogrody nad Narwią	www.facebook.com/wiszaceogrodynadnarwia	50	40
Karczma Litewska (lit)	www.facebook.com/karczma.litewska	50	30

Source: own elaboration

Preliminary semantic analysis of the collected research material revealed the existence of four main types of positive emotion memes, and their opposites. These were: satisfaction or lack thereof, a sense of security or lack thereof, confidence or lack thereof, and the creation of positive associations or lack thereof, referring to functional, mechanic and human factors of culinary service (Fig. 1).

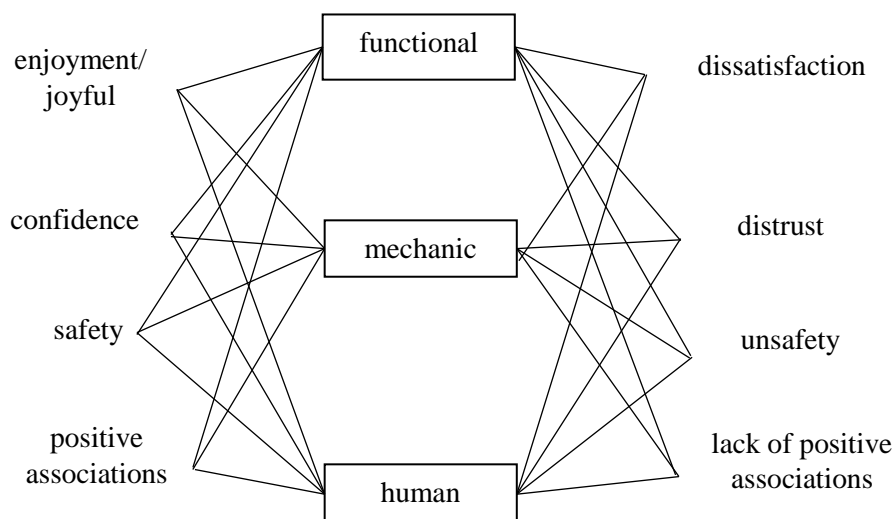


Fig. 1. Theoretical framework of the study

Source: own elaboration

With this in mind, the following sub-hypotheses were formulated:

H1: The memetic pool expressing culinary experience will most likely be dominated by the memes connected with the emotions referring to the functional factor of culinary experience, although mechanic and human factors do not have important influence on the formation and transfer of emotion memes.

H2: The analysis of meme maps, which are the expression of the memetic pool, enables the study of the way of perception and expression of culinary experiences and could be useful in management of quality of regional culinary services.

Descriptive statistics were used to present the results. The Spearmann correlation coefficient was used to analyse the relationship between the individual emotion memes and the components of the culinary experience. Statistical analysis was performed with the use of STATISTICA 12.

4. Results

The research analysed the contents of 370 comments, 198 of which were authored by women and 172 by men. Each entry was characterized by the presence of positive and / or negative emotion memes. Positive connotations in relation to culinary experience were expressed mainly in relation to dish quality (functional factor) and service quality (human factor). The elements that determine the formation of sensations associated with the specificity of an interior (mechanic factor) were expressed the least often. The externalization and further dissemination of negative emotions remained roughly at the same level with respect to each of the elements of culinary experience. For more details see on Fig. 2.

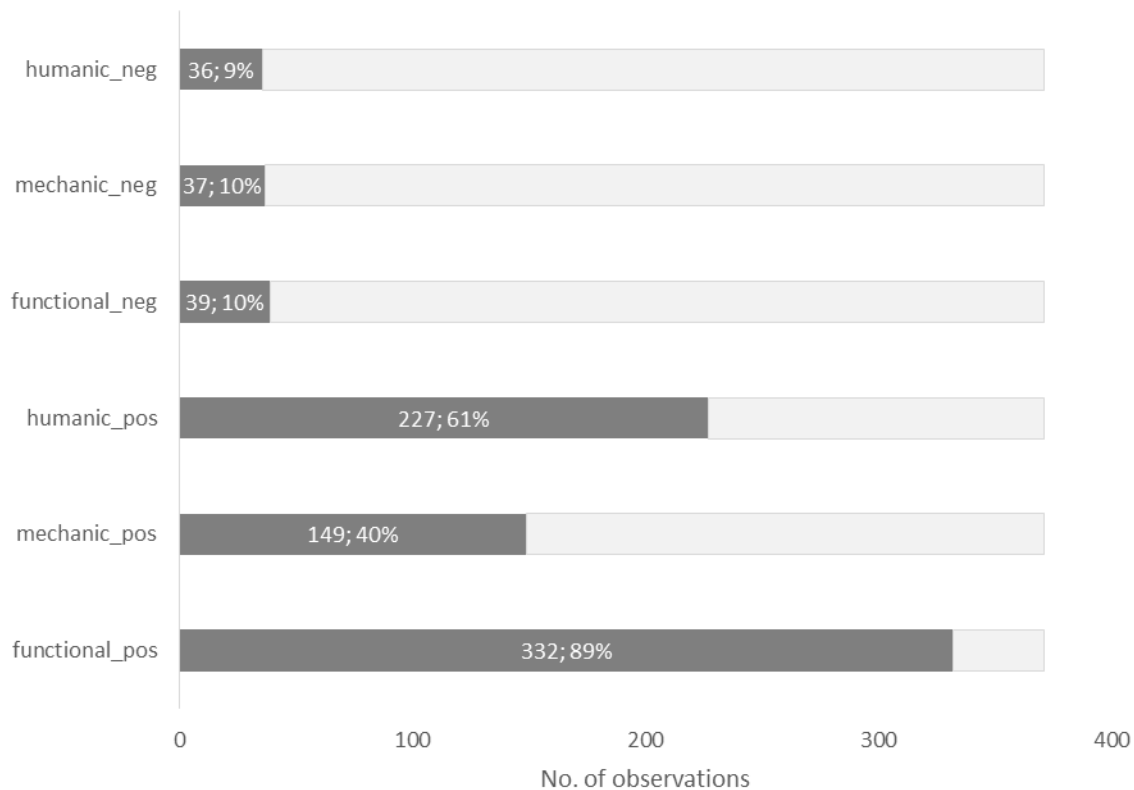


Fig. 2. The frequency of occurrence of positive and negative associations with regional culinary experience, based on semantic analysis of posted comments on regional cuisine entities from podlaskie region (n=370)

Source: Own elaboration

The most frequently, from the perspective of the total amount of analysed comments, the most commonly encountered were the expressions of satisfaction (91.9%) and positive associations with the service, for example, referring to e.g. the family home (92%). These memes are very strongly correlated with each other ($r_s = 0.98$, $p < 0.05$). The expression of confidence in the service and the sense of security occurred with a frequency of 73% and 54%. Memes related to satisfaction are also positively correlated with the expression of confidence ($R = 0.46$, $p < 0.05$) and the sense of security ($r_s = 0.98$, $p < 0.05$).

Memes with negative emotional overtones appeared with a far lower frequency. Disappointment, lack of sense of security and lack of positive associations appeared in 8% of comments. Lack of confidence occurred in 11% of opinions. More details are shown on fig. 2.

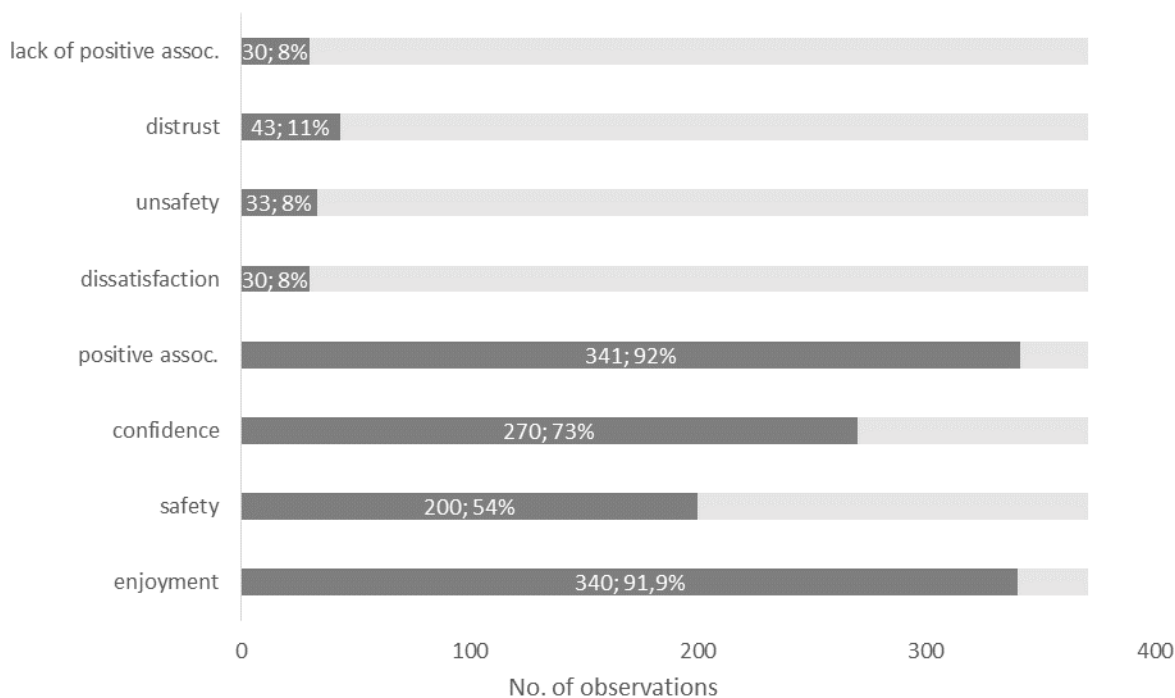


Fig. 2. Memetic map based on the frequency of occurrence of positive and negative memes of emotions on analysed comments (n=370)
 Source: Own elaborations

The analysis of Spearman correlation coefficient values indicates a significant relationship between the quality of the served dishes (functional factor of experience) and the emergence and further extension of satisfaction. A similar association was also found in the case of the meme of association of the current situation with previous memories (i.e. generation of positive associations) as well as the meme of trust. The interior design (mechanic factor) has little or no influence on the creation of positive emotions memes. Quality of service (human factor) has little significance in the case of memes of satisfaction, confidence, and positive associations. But it does not affect the formation of the meme of the sense of security. More details are shown on Table 2.

Table 2. Spearmann correlations between memes of positive emotions and elements of culinary experience ($p < 0,05$); where: < 0.2 - lack of relation; $0.2 - 0.4$ – minor relation; $0.4 - 0.7$ – moderate relation; $0.7 - 0.9$ – quite strong relation; > 0.9 – very strong relation

Memes of:	Components of culinary experience		
	humanic	functional	mechanic
Enjoyment	0,333586	0,649691	0,203526
safety	0,192646	0,277631	0,159891
Confidence	0,266848	0,415578	0,201895
Positive associations	0,326121	0,663230	0,198444

Source: own elaboration, with using STATISTICA 12

Functional factor of culinary experience as well as human factor has the biggest effect on creation and dissemination of memes of dissatisfaction, unsafety, distrust and lack of positive associations. There is small effect or lack of dependence between thee memes and mechanic factor (Table 3).

Table 3. Spearmann correlation between memes of negative emotions and the elements of culinary experience ($p < 0,05$); where: < 0.2 - lack of relation; $0.2 - 0.4$ – minor relation; $0.4 - 0.7$ – moderate relation; $0.7 - 0.9$ – quite strong relation; > 0.9 – very strong relation

Memes of:	Components of culinary experience		
	humanic	functional	mechanic
dissatisfaction	0,470450	0,671905	0,147220
unsafety	0,537199	0,664597	0,205724
distrust	0,592340	0,699415	0,223965
Lack of positive associations	0,470450	0,671905	0,147220

Source: own elaboration

5. Discussion

The results of the study indicate that the hypothesis concerning the dominant role of the functional factor in the culinary experience formation is appropriate. The memes of satisfaction and positive associations are dominant in the constructed memetic map and constitute a substantial correlation in the functional factor. Therefore, the results of the research also indicate that the creation and expression of a particular emotion meme is correlated with the elements of culinary experience. Most often it relates to the functional and human factors. Such type of dependence is minor in the case of the mechanic factor. These results may confirm the research conducted by Mkono et al. (2013), who indicated that the culinary experience related to untypical flavours and culinary compositions is an element that builds tourist satisfaction and significantly influences the holistic tourist experience. From the perspective of creating positive associations between local cuisine and a location, it can be seen as a peak of such experience. Hence, building a memetic map relating to an experience can help in determining the key elements of the culinary service for a particular destination. This, in turn, translates into building mental, positive associations connected with a destination, and thus creating the attitudes of loyalty in the consumers. However, in the case of certain products, e.g. vine, sushi, Taar (2017) notes an interesting correlation associated with assigning them the culinary role, causing direct consumer satisfaction, regardless of the taste values, etc. These may be culinary items which, in certain social groups, are perceived as exemplary and, perhaps, elevating the prestige of the consumer.

Interesting work in the field of mapping culinary experience was realized by Byrnes et al (2015). Analyzing the manner of perceiving odor stimuli (chemesthetic stimuli) by experts and people with no culinary practice/experience, they have demonstrated that the manner of expressing certain odor stimuli varied in the case of different groups. Therefore, as stated by Giboreau (2017) “context needs to be studied more by adding variables to current research protocols and the foodservice practices are helpful to structure and choose the relevant variables for each project.”

Referring to the results of the presented research, it is important to emphasize the important role of analysing socio-economic variables in the study of perception of culinary experience. Unfortunately, in the case of netnographic methodology (Jemielniak, 2013) and the specifics of the data contained in social networks, this can be embarrassing and sometimes unfeasible.

Conclusions

The subject of the work was the formation and transfer of memes relating to emotions. Hekkert and Schifferstein, 2008 suggest the important role of the emotional factor in the perception of the product and the way it is experienced. Similarly, according to Schifferstein (2010), each of the human senses is sensitive to the different types of stimulation, and experiencing products and services in a holistic manner is associated with „incoming sensory information”. Such type of transmission It can have various effects on the functioning of humans, i.e. their affective, cognitive and behavioural activities. In addition, the influx of information „may evoke memories or associations”. The formation of memories or relationships is a mental change being a derivative of consummating, decoding and assimilating a particular meaning. In turn, this meaning can be transferred and, depending on the social environment (virtual and real), spread in different ways. In the analysed case, the content diffusion environment was a social network. Memetic content has been included in selected UGC (textual) resources. The semantic decomposition of the collected comments allowed to isolate memes of emotions and create a map showing the frequency of their occurrences. Because of its properties, the UGC is also an element that allowing for a further transfer of generated emotions. The representation of such a transfer is the creation of a memetic map showing the participation of particular groups of emotion memes in the general way of perceiving certain phenomena (in this case regional culinary experience). The resulting map is, in a sense, a quasi-ontological image of part of the culinary experience along with its associations. In this map, from the perspective of the formation of perception of the tourist experience, the key role is played by the functional and human factor of culinary experience. The element specific to the destination (e.g. related to cultural characteristics), the mechanic factor, does not usually play a key role, is least represented. and does not show significant correlation with emotion memes. Similar considerations related to the general memes are presented, among others, by Atadil et al. (2017). The authors, based on the results of the analysis of meme maps for Antalya, based on the qualitative attributes of this destination, suggest that the so called general memes are key elements for creating memories and declaring another visit. However, it is equally important to create, as in the case under analysis, with a significantly lower frequency, and the externalization of unique memes. The authors cited above indicate the differences in the composition and the frequency of occurrence of memes unique in the memories of various visitors of different nationalities.

Building memetic maps through semantic decomposition and UGC analysis can be an important contribution to building a marketing message targeted at different segments of the market. It also could be used in management and improvement of quality of regional culinary services. It may also be a contribution to a careful analysis of the perception of reality typical of a location through the use of diverse market segments. The conducted research, due to its pilot nature, only referred to testing the possible methodology of decomposition and basic analyses related to the constructed memetic map. Further work should be concerned with defining the way in which

emotional memes are exposed to the behavioural aspects of functioning of social networking users who consume shared content. This concerns above all the relationship between the number and nature of emotional memes and the organic range of the element in which they are contained.

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