CONTENTS

VOLUME 9 NUMBER 2 DECEMBER 2019

Jānis Teivāns-Treinovskis, Margarita Nesterova, Sergey B. Shchepanskiy, Marina Proshina.

IMPACT OF LEGAL REGULATION OF WEAPON TURNOVER ON PUBLIC AND NATIONAL SECURITY 367

Tadas Limba, Andrius Stankevičius, Antanas Andrulevičius.

TOWARDS SUSTAINABLE CRYPTOCURRENCY: RISK MITIGATIONS FROM A PERSPECTIVE OF NATIONAL SECURITY 375

Somdech Rungsrisawat, Kittisak Jermsittiparsert, Sattapas Thanetpaksapong.

DO THE CRIME AND THE SOCIOECONOMIC STRAIN AFFECT THE ECONOMIC GROWTH? A CASE OF AN EMERGING ASEAN ECONOMY 391

Zenona Ona Atkočiūnienė, Olga Miroshnychenko.

TOWARDS SUSTAINABLE DEVELOPMENT: THE ROLE OF R&D SPILLOVERS IN INNOVATION DEVELOPMENT 409

Perizat Beisekova.

CLUSTER FUNCTIONING AS A DIRECTION OF SUSTAINABLE TERRITORIAL-INDUSTRIAL PARTNERSHIP 421

Marlina Widiyanti, Ernie Hendrawaty, Djawoto.

ANTECEDENTS OF ECONOMIC CONVERGENCE IN ASEAN COUNTRIES: FOREIGN DIRECT INVESTMENT, TRADE, GOVERNMENT SIZE, POPULATION AND ECONOMIC CONVERGENCE 431

Yelena Petrenko, Elena Vechkinzova, Lyussiya Togaibayeva.

DEVELOPMENT OF CREATIVE CLUSTERS OF A POLICULTURAL REGION: CHALLENGES FOR GOVERNANCE 447

Liubov Lehoux, Hermann Duck, Ravil Akhmadeev, Tatiana Morozova, Olga Bykanova.

SUSTAINABLE DEVELOPMENT FACETS: TAXATION SOLUTIONS FOR THE ENERGY INDUSTRY 457

Isfenti Sadalia, Nisrul Irawati, Masyhuri Hamidi, Giriati, Saadah Yuliana.

HOW THE FINANCIAL OPENNESS ACCELERATES THE ECONOMIC GROWTH OF LEADING ASEAN ECONOMIES 473

Yusro Hakimah, Andhyka Tyaz Nugraha, Andi Surya, Armalia Reny Wijayanti Ananda, Pudji Astuty.

DOES THE ELECTRICITY CONSUMPTION DETERMINE THE ECONOMIC GROWTH AND ENERGY PRICES IN ASEAN COUNTRIES? 489

Radomír Ščurek, Věra Holubová.

THE PHYSICAL SECURITY OF BUILDINGS OF PUBLIC UNIVERSITIES 495

Isfenti Sadalia, Nisrul Irawati, Masyhuri Hamidi, Giriati, Saadah Yuliana.

HOW THE CURRENCY CRISIS EFFECTS THE RELATIONSHIP BETWEEN FINANCIAL INFLOWS AND ECONOMIC GROWTH IN ASEAN COUNTRY 517

Sakapas Saengchai, Chanathat Boonrattanakittibhumi, Buppachart Urairak.

INSIGHTS INTO THE EXTERNAL DEBT, CORRUPTION AND ECONOMIC GROWTH NEXUS: A CASE STUDY 533

Svetlana Drobyazko, Iryna Alieksieienko, Maryna Kobets, Elena Kiselyova, Mykola Lohvynenko.

TRANSNATIONALISATION AND SEGMENT SECURITY OF THE INTERNATIONAL LABOR MARKET 547

Aleksy Kwilinski, Volodymyr Tkachenko, Aleksandra Kuzior.

TRANSPARENT COGNITIVE TECHNOLOGIES TO ENSURE SUSTAINABLE SOCIETY DEVELOPMENT 561

Kittisak Jermsittiparsert, Sakapas Saengchai, Chanathat Boonrattanakittibhumi, Thitinan Chankoson.

THE IMPACT OF GOVERNMENT EXPENDITURES, GROSS CAPITAL FORMATION, TRADE, AND PORTFOLIO INVESTMENT ON THE ECONOMIC GROWTH OF ASEAN ECONOMIES 571

Alona I. Boiarchuk.

REDICTING PLAUSIBLE THREATS: IMPACT OF GLOBALIZATION PATTERNS ON NATIONAL ECONOMIES 585

Marcin Jurgilewicz, Krystyna Kmiotek, Robert Dankiewicz, Andrzej Misiuk.

MEDIATION IN CIVIL MATTERS AS AN EXAMPLE OF THE METHOD USED IN LEGAL SECURITY MANAGEMENT AND OPTIMIZATION OF COSTS OF PROCEEDINGS 595

Marko Roško, Marijana Musladin, Rastislav Kazanský.

COUNTER-TERRORISM IN THE UNITED KINGDOM: SUSTAINABLE MEASURE OR VIOLATION OF HUMAN RIGHTS 603

Piotr Siemiątkowski, Patryk Tomaszewski Oktawia Jurgilewicz.

ASSESSMENT OF BASIC ELEMENTS OF THE SECURITY SYSTEM OF LOCAL COMMUNITIES 617

Artem Krasnov, Bakyt Beknazarov, Dinara Jarikbayeva, Dinara Yeshpanova, Alma Karshalova.

SECURITY OF THE EURASIAN ECONOMIC UNION MEMBER STATES: SOCIOECONOMIC AND FINANCIAL ASPECTS 637

Tran Thi Bich Ngoc, Galina Anzelmovna Barysheva, Tran Duc Trung.

INDUSTRIAL ZONE DEVELOPMENT AND INTERNAL MIGRATION ISSUE IN VIETNAM: EVIDENCE FROM Binh Duong PROVINCE 649

Andrey Smirnov, Olga Lavrinenko, Alina Ohotina, Halina Shmarlouskaya, Alina Betlej.

ASSESSMENT OF CONVERGENCE PROCESSES OF SOCIAL-ECONOMIC SECURITY INDICATORS IN LATVIAN MUNICIPALITIES 663

Sudawan Somjai, Saroge Vasuvanich, Akarapitta Meechaiwong, Watcharin Joemsittiprasert.

SUSTAINABLE DEVELOPMENT FACETS: DOES SOVEREIGN DEBT ACCELERATE THE ECONOMIC GROWTH 675

Phatthanan Hiranrithikorn, Chayongkan Pamornmast.

DOES TRANSPORT INFRASTRUCTURE FOSTERS THE ECONOMIC GROWTH: AN ASEAN PERSPECTIVE 689

Somdech Rungsrisawat, Chayongkan Pamornmast.

DOES THE EDUCATION, HEALTH AND EMPLOYMENT DETERMINE THE ECONOMIC GROWTH: A CASE STUDY 701

Sutarno.

PRECONDITIONS OF SOCIETY SAFETY THOUGH ENHANCEMENT OF MEDICAL RESPONSIBILITIES: A CASE STUDY 715
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Impact of Legal Regulation of Weapon Turnover on Public and National Security

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Abstract. The concepts of security and weapons are closely related, which equally applies to both public security and national security. In order to ensure their national security, countries are trying to purchase the most effective weapons. In order to achieve the necessary level of public security, the country arms law enforcement personnel. Such armament is legitimate and contributes to the strengthening of general security. At the same time, the purchase of weapons by the population for individual security purposes is not so unambiguous. On the one hand, law-abiding citizens have the right to protect their lives and health from criminal threats. On the other hand, a free turnover of a large number of weapons increases their accessibility and the possibility of getting hold by individuals who are able to use them for criminal purposes. The question arises: which weapons can be available to the population and which not. After all, weapons can be different. A special position in the category of weapons is occupied by cold weapons, the criminal liability for the possession of which is provided for in some countries. Moreover, the question of what should be considered a cold weapon is sufficiently disputable. All these issues are to be studied in the framework of this article.

Keywords: firearms; cold weapons; illegal weapon turnover


JEL Classifications: K42, O10, P00

Additional disciplines: law

1. Introduction

In recent years, issues related to the legal and illegal turnover of firearms and other weapons have become more and more topical in society (Tumalavičius; Ivančiks; Karpishchenko 2016). In countries with the most liberal regulation of the weapon turnover, the issue of prohibiting their free sale is increasingly raised (Tumalavičius et al. 2017a, 2017b). As an argument in favour of such a decision, there is a growing number of cases of illegal use of firearms, which resulted in a large number of victims. Moreover, more and more often violent crimes involving the use of weapons are committed by persons previously held criminally liable (Zahars, Stivriņiece 2016; Praise et al. 2019). In this situation, at first glance, it seems logical to tighten the legal regulation of the weapon turnover (Bayzakova 2013). But is this as justified, as it may seem? As an example, we can consider the situation in countries with more tightened regulation of the turnover of firearms and cold weapons.
2. Situation in countries with more tightened regulation of the turnover of firearms and cold weapons

One of these countries is undoubtedly the Russian Federation. There along with firearms, the turnover of cold weapons is limited as well. Moreover, some conflicts allow a fairly ambiguous interpretation of the rules on the turnover of cold weapons, in some cases, including among cold weapons collection items, which are antiquarian. It should be noted that in the Republic of Latvia there is no criminal penalty for possession of cold weapons at all. This approach is based on the conception that the infliction of bodily injuries or causing death to a person can be committed with objects that are not related according to their parameters to cold weapons, but are no less dangerous (ax, kitchen knife, etc.). From this point of view, maintenance of criminal liability for possession of cold weapons looks absolutely pointless. There is no significant difference in the legal regulation of the turnover of cold weapons in Lithuania and Estonia.

In the United States, the right to own a weapon is considered an integral part of human rights and a serious deterrent that prevents most of the violent crime. In American society, there is an opinion that persons inclined to commit crimes will always have the opportunity to get weapons illegally, while law-abiding citizens will be strictly limited in their actions by law. In this situation, great importance is attached to the awareness of their own safety of this category of citizens.

Returning to the issues of the legal regulation of weapon turnover in the Russian Federation, it should be noted that an objective assessment of the current Criminal Code of the Russian Federation and the identification of gaps and shortcomings in it testifies to the need to improve the legal technique for creating legal norms of criminal law. Normative legal prescriptions according to the definition developed in the general theory of law are legal formulas expressing a completed thought, in the form of which the content of the rule of law is stated in the text of the law. This problem does not bypass also the criminal legal norms concerning illegal weapon turnover. This situation is aggravated by the fact that the legal norms providing for criminal liability in this area are blanket, that is, they do not describe criminal acts themselves, but refer to another normative act. And this leads to an accumulation of a degree of conflict or uncertainty.

The language of the criminal law is a system of lexical and grammatical means of expressing criminal provisions, while a significant amount of lexical composition is terminology – a set of terms used in the criminal law. The terminology of the criminal law is not homogeneous according to belonging to certain field, that is, not all terms used in the criminal law are actually connected to crime. The specificity of criminal legislation is that one of its tasks is to protect the most important goods, interests and social relations from the criminal threats, which are regulated by other branches of law, stipulates the presence of terms of different fields.

N. I. Pikurov (1998) states that “if the term is associated with a specific sphere of social relations governed by law, then its terminological field will be the field or a set of fields that regulate these relations”.

Terms of other fields are present in the criminal provisions of various types, and in the General, and in the Special Part of the criminal law. But basically they are contained in the formulations of blanket criminal prohibitions (blanket dispositions of criminal law norms – according to the generally accepted classification); therefore, following the other authors, it is appropriate to call this group of terms a blanket terminology. When using blanket terminology in the criminal law, the legislator faces two problems:
- the problem of the unity of terminology;
- the problem of inter-branch harmonization of the content of blanket terms.

In the modern period, practically all branches of the Russian legislation are in a state of permanent update, therefore the problem of the unity of terminology arises, and quite often, in connection with the change of terminology in the corresponding legislation. In the Russian criminal law, traditionally, the criminal legislation does not include a special section on criminal terminology. This leads to a difference in the interpretation by courts of certain concepts, and as a consequence, not always the fair application of criminal law. The legislator has no right to ignore the requirements of the practice of uniform interpretation and application of criminal law norms.
They constitute an impressive group of inaccurate, unclear features of many crimes, already identified by science and practice over the years of operation of the Criminal Code 1996 of the Russian Federation.

Taking into account the punitive nature of the criminal law, which is expressed in the criminal prosecution of a person for the commission of an action (inaction) falling under the signs of a crime, formulated including blanket terminology, a uniform definition of these terms is essential. The legality of criminal prosecution and imposition of criminal penalties depends on the correct interpretation.

In accordance with the principle of the systemic nature of legislation, one of the manifestations of which is the compliance of the criminal law with legislation of other fields, the solution of this problem can be the only one. It consists in the fact that the replacement or exclusion of existing ones or the introduction of new terms in the corresponding legislation should entail an appropriate adjustment of the blanket terminology in the criminal law.

However, in the practice of lawmaking, it is often possible to observe otherwise. It is characteristic to apply in practice Article 222 of the Criminal Code of the Russian Federation, which is a blanket rule referring to the Federal Law of the Russian Federation of December 13, 1996, No.150-FZ “On Arms”. At the same time, this Federal Law lacks a number of terms and definitions that allow qualifying items as weapons and their types. In practice, this leads, in the final result, to unlawfully prosecuting persons who have not committed crimes, that is, the socially dangerous act.

With the Federal Law No.391-FZ of December 5, 2017 “On Amendments to Certain Legislative Acts of the Russian Federation” amendments were made to the Federal Law No.150-FZ of December 13, 1996 “On Arms” (on improving the rules on the turnover of weapons of cultural value), which prohibits the acquisition of a cold weapon having a cultural value, without obtaining a license.

The adoption of this Federal Law was carried out with the aim of enforcing the Judgment of the Constitutional Court of June 17, 2014 No.18-P “On the Case on the Verification of the Constitutionality of Part 4 of Article 222 of the Criminal Code of the Russian Federation and Article 1, 3, 6, 8, 13 and 20 of the Federal Law “On Arms” in connection with the complaint of the citizen N. V. Uryupina”, decriminalizing the illegal sale of cold weapons of cultural value, and liberalization of the rules on the turnover of antiquarian and other cold weapons of cultural value to ensure compliance with constitutional rights of its owners.

At the same time, the Federal Law “On Amendments to Certain Legislative Acts of the Russian Federation” (on improving the rules on the turnover of weapons of cultural value) not only restricts the acquisition of all types of antiquarian weapons and most types of weapons of cultural value by licensing it, but also does not introduce any changes in the norms of the Criminal Code of the Russian Federation and the Code of Administrative Offenses of the Russian Federation on liability for the illegal weapon turnover and violation of turnover rules. This completely contradicts the Judgement of the Constitutional Court of the Russian Federation of June 17, 2014 No.18-P, since according to part 4 of Article 222 of the Criminal Code of the Russian Federation, recognized partially inconsistent with the Constitution of the Russian Federation, the responsibility for the illegal sale of cold weapons of cultural value is not excluded, and the Code of Administrative Offenses of the Russian Federation does not establish liability for violation of the rules of turnover of cold weapons of cultural value corresponding to the degree of danger of the given weapons and providing legal protection of cultural values.

In fact, the Judgement of the Constitutional Court of the Russian Federation of June 17, 2014 No.18-P remains unenforced in violation of the Federal Constitutional Law “On the Constitutional Court” and Article 1 of the Criminal Code of the Russian Federation, since the recognition by the Constitutional Court of a rule of the law partially or completely inconsistent with the Constitution of the Russian Federation requires the legislator to amend this rule, and amendments to the Criminal Code of the Russian Federation are introduced only by federal laws subject to inclusion in the Criminal Code of the Russian Federation.
At the same time, a rule recognized as partially or wholly inconsistent with the Constitution of the Russian Federation loses its force as to its inconsistency with the Constitution of the Russian Federation from the moment of its passing, and the Judgement of the Constitutional Court has the force of law and is effective immediately before the legislator makes appropriate amendments to this rule.

Nevertheless, the courts continue to be guided by this norm of the Criminal Code of the Russian Federation, for example, the sentence of the magistrate of the court circuit No.108 of the Bogorodsky district of Moscow of July 8, 2016 in the case No.1-2 /2016, who condemned N. under part 4 of Article 222 of the Criminal Code of the Russian Federation for the illegal sale of cold weapon, with the confiscation of antiquarian weapon. This sentence violates the logic of the norms of the Criminal Code of the Russian Federation, Articles 1, 13 and 22 of the Federal Law “On Arms” in the version of the Federal Law of July 10, 2012 and the Judgement of the Constitutional Court No.18-P of June 17, 2014.

The Constitutional Court ordered the legislature to pass a federal law on liability for the illegal sale of these weapons, corresponding to its degree of danger, but such a law has not been adopted to the present day, which does not negate the effect of the said Judgement of the Constitutional Court, as having the force of law and entailing loss of power of part 4 of Article 222 of the Criminal Code of the Russian Federation as contradicting the Constitution of the Russian Federation with regard to the liability for the illegal sale of cold weapons of cultural value. Therefore, the illegal sale of cold weapons of cultural value cannot entail responsibility under part 4 of Article 222 of the Criminal Code of the Russian Federation, but in the case of its illegal sale or trade, liability under Article 14.2 of the Code of Administrative Offenses of the Russian Federation – for the illegal sale of goods, the free sale of which is prohibited or restricted by legislation, which provides for optional confiscation of items – is possible.

3. Legal and logical basics for liberalization of the legal regulation of circulation of arms.

The introduction of amendments to Article 222 of the Criminal Code of the Russian Federation is necessary, since the objectives of the adoption of this Federal Law No.391-FZ were the execution of the Judgement of the Constitutional Court of June 17, 2014. N18-P through the final legalization of the decriminalization of the illegal sale of cold weapons of cultural value and the liberalization of the rules of turnover of antiquarian and other cold weapons of cultural value in order to reduce the negative legal effect on its owners and ensure compliance with their constitutional rights.

But the adopted Federal Law No.391-FZ only strengthens the pressure on the owners of these weapons and does not introduce amendments to the Criminal Code of the Russian Federation that decriminalize the illegal sale of cold weapons of cultural value. The Federal Law No.391-FZ introduces the duty of the owners of antique weapons, their copies and replicas, as well as cold weapons of cultural value, to obtain licenses for collecting weapons for their acquisition and possession.

Weapons of cultural value, as well as copies and replicas of old (antique) long-barrelled firearms, not intended for shooting cartridges, manufactured before the end of 1899, are intended for use in cultural and educational purposes. Currently, the rules on the acquisition, sale (with the exception of trade), transfer and transportation of many types of weapons of cultural value are absent in the Federal Law “On Arms”, which indicates the existence of the right to perform these actions of their turnover by any persons, taking into account the provisions of part 3 of Article 15 of the Constitution of the Russian Federation and Clauses 1 and 2 of Article 129 of the Civil Code of the Russian Federation.

At the same time, citizens of the Russian Federation who have attained the age of 18 have the right to purchase old (antique) cold weapons, to which the antique cold weapons manufactured before the end of 1945 (the federal law “On Arms” 1996) is attributed. These weapons are purchased without a license and is not registered (part 4 of Article 13 of the Federal Law “On Arms”). Possession of civilian weapons, which is purchased without a license and whose registration with an authorized body is not required, is carried out without permission
to possess weapons (The federal law “On Arms” 1996).

The exclusion of the possibility of using their types of cultural value as firearms, as well as copies and replicas of old (antique) long-barrelled firearms, not intended for shooting cartridges and manufactured before the end of 1899, is provided by the prohibitions on the sale of cartridges to firearms to persons, not authorized to possess their specific types, and gunpowder to persons who do not have permission to possess and carry hunting firearms (Article 18 of the Federal Law “On Arms”).

The weapon itself, which has cultural value, remains in the list of weapons, which is illogical, given the prohibition on its use to defeat the target and the lack of restrictions on the turnover of weapons of cultural value. There is also no clear definition in the blanket norms on the turnover of items of cultural value, but not weapons, to which items that were weapons in the past may be classified, and many of which can be used to defeat the target with the same risks of harm to health or death to a person or damage to a valuable item with which such a weapon can be used for this purpose.

The Federal Law “On Arms” lacks a precise definition of weapons of cultural value, indicating the specific types of weapons that can be attributed to it and the criteria for their difference from standard modern weapons, and the definition of cold weapons of cultural value indicating their specific types and the criteria for their difference from other cold weapons.

The above mentioned requires the introduction of a precise definition of the term of weapons of cultural value, given the lack of rules in the Federal Law “On Arms” on the acquisition and commission of many other actions concerning the turnover of the most dangerous types of firearms of cultural value and the introduction of licensing for the acquisition of all types of cold weapons, having a cultural value.

After the entry into force of this procedure, the acquisition and possession of cold weapons and weapons of cultural value in the Russian Federation has become more tightened than in a significant number of countries in the world in which many or all types of cold weapons can be freely acquired and to purchase antiquarian weapons is not required obtaining a license or it is enough to obtain a license issued without strict limitations.

The Federal Law No.391-FZ “On Amendments to Certain Legislative Acts of the Russian Federation” does not take into account the lack of rules on the turnover of many types of cold weapons that do not have cultural value, allowing their free turnover, and referring sporting cold bladed weapons to products that are constructively similar to weapons in part 5.1 of Section 5 of the State Standard GOST R 51215-98 “Cold Weapons. Terms and definitions” and in Article 1 of the Federal Law “On Arms”, in which it is classified as sports equipment constructively similar to weapons, the characteristics of which are fixed in the rules of the competition, but sports equipment that is constructively similar to weapons is classified as products constructively similar to weapons.

The adopted Federal Law “On Amendments to Certain Legislative Acts of the Russian Federation” (on improving the rules on the turnover of weapons of cultural value) entered into force on January 1, 2018, without specifying the exact timeframe for obtaining licenses for collecting weapons by citizens, who are possessing weapons of cultural value, until the expiration of which it should be prohibited to bring these citizens to administrative responsibility for violation of the rules on the possession of weapons or the recognition that possession is illegal and bringing to administrative or criminal liability for illegal possession of firearms.

Thus, the adoption of this Federal Law may entail a massive administrative and criminal prosecution of citizens who have or are acquiring weapons of cultural value, as well as the seizure of their weapons prior to the obtaining of a license or its alienation and confiscation by a court decision in cases provided for by the Code on Administrative Offenses of the Russian Federation. This will entail a violation of Article 2, 19, 35 and 55 of the Constitution of the Russian Federation and the retreat of the Russian Federation from the principles of a democratic and rule-of-law country; therefore, the introduction of the above mentioned amendments are necessary.
Taking into account the above mentioned, this Federal Law violates the logic not only of the norms of the Criminal Code of the Russian Federation, but also of the norms of the Code of Administrative Offenses of the Russian Federation, the Federal Law “On Arms” and the constitutional legislation of the Russian Federation, which testifies to the need for a comprehensive study of violations of the logic of norms of several fields of law in the analysis of compliance with the logic of blanket dispositions of the norms of the Criminal Code of the Russian Federation on the illegal weapon turnover. Carrying out such a comprehensive study may be necessary for the analysis of other blanket dispositions of the norms of the Criminal Code of the Russian Federation, often referring to various legislative acts that define specific legal prohibitions.

One way to eliminate such problems when the legislator makes amendments to the criminal law is to comply with the rules of legal technique, including:

- linguistic (rules of clarity, accuracy, neutrality, economy of legal texts, unambiguity of terms used in the text, perfection of syntactic constructions, stability of ways of expression of norms, etc.);
- logical (the rules of identity of the interpretation of identical objects, the structuring of the text of the legal act, the crossability of legal standards, etc.);
- gnoseological (rules on the reflection of a social phenomenon with adequate linguistic means, accuracy of determining the subject of regulation of a legal act, knowledge of the context of the act being developed).

Nevertheless, in Russian criminal law, traditionally the criminal legislation does not include a special section on criminal terminology.

This leads to a difference in the interpretation by courts of certain concepts, and as a consequence, not always the fair application of criminal law. The legislator has no right to ignore the requirements of the practice of uniform interpretation and application of criminal law norms. They constitute an impressive group of inaccurate, unclear features of many crimes, already identified by science and practice over the years of operation of the Criminal Code 1996 of the Russian Federation.

4. Assessment of the real impact of liberalization of the legal regulation of civil arms circulation on public and national security.

As an option for eliminating these shortcomings, it would be useful to supplement the current Criminal Code of the Russian Federation with Section XIII “Concepts used in this Code”, where provide the interpretation of all the concepts used, but the existing interpretations transfer to this section. It should be noted that in Latvia a similar law exists. This is the “Law on the Entry into Force of the Criminal Law of Latvia and its Application” of 1998. In this law, a number of terms associated with the application of certain norms and concepts are stipulated. At the same time, the amendments in any legal norms by the legislator must be carried out on a strictly scientific basis, which will allow a more fair application of the criminal law (Tumalavičius; Nikolayevskyy; Endziņš 2017).

The possibility of using the best practices of foreign countries, and re-evaluate the provisions of the criminal law relating to illegal turnover of cold weapons, should also be considered. The danger of turnover of cold weapons is associated with the possibility of causing serious harm to health or life of citizens by using them. The level of violent crime in countries with a liberal and more tightened legal regulation of weapon turnover should therefore be considered as the criterion of the effectiveness of the norms of the criminal law.

The number of intentional homicide per 100,000 inhabitants per year should be considered as the most objective criterion. In Russia, this indicator at the end of 1916 is 10.82, but in North Korea - 15.2. In the United States of America, with a free trade of weapons, this figure is more than two times lower - 4.9, and in Latvia, where the legal regulation of the turnover of weapons is considered the most liberal in the Post-Soviet space, this figure is 3.5 (List of countries by level ... 2016). In Canada, this figure is 1.8 (Statistics Canada, Police-reported crime ... 2016). That is, the validity of the requirement of more tighter regulation in the sphere of the researched issue in order to achieve a higher level of public security looks, to put it mildly, unconvincingly.
Much more important is the level of economic development of a particular country and the level of legal awareness and legal culture in it. We should not underestimate the preventive role of weapons which are possessed by a law-abiding citizen. In some cases, it can have a significant impact on both the offender who attempts to commit the crime and the owner of the weapon. The presence, or even the assumption of possession of a weapon by a potential victim, is a serious enough deterrent for the offender and a factor that gives confidence to the victim in the ability to protect his interests and those of others. This circumstance is fundamental in justifying a fairly liberal or absolutely free turnover of firearms. In turn, restrictions on the possession of cold weapons at home for economic or self-defence purposes have no rational justification at all, and the fine line separating cold weapons from collection items or from kitchen utensils facilitates the issuing of unlawful sentences and court decisions.

Conclusions

The analysis carried out in the course of this study allows us to conclude that tightening the legal regulation of the weapon turnover does not always bring the expected result. Moreover, the impact of this regulation on the level of violent crime, and, in the first place, the level of intentional homicide, is not noticeable. At the same time, rationally unreasonable restrictions in this area give rise to many problems related to the interpretation and application of these norms. Of great importance are explanations of the terms proposed by the laws themselves, contributing to the achievement of the required uniformity in the sentences of courts in identical or similar cases.

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TOWARDS SUSTAINABLE CRYPTOCURRENCY: RISK MITIGATIONS FROM A PERSPECTIVE OF NATIONAL SECURITY

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Abstract. Cryptocurrency market is developing fast during the past few years. Cryptocurrency now is available as a form of payment for retail goods, as an instrument for a wholesale international transaction a mean of exchange for whatever goods and is available through ATM’s. Moreover, it is developing as a possibility for fundraising a) as a private debt b) as seed capital. Companies like Facebook are discussing launching own cryptocurrency. Bank UBS is developing its blockchain based virtual currency as well. However, scientist agrees that cryptocurrency has an important impact to national security. It became a relevant instrument for illegal good transactions, a mean of exchange in the darknet and an instrument for money laundering or infrastructure for new kind of money-laundering practices (for example- “Smurfing” phenomena (EU Observer, 2019)) European Union is launching AML and KYC procedures for the cryptocurrency market. Would it be efficient? Why are we implementing KYC and AML procedures for cryptocurrency? Is it able to minimize risks?

Keywords: cryptocurrency; know your customer; anti-money laundering; national security

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JEL Classifications: O33

Additional disciplines law, sociology

1. Introduction

The cryptocurrency market is developing. Within eleven years there are 2290 know cryptocurrencies worldwide (www.coinmarketcap.com 2019), which is 12 times more compared to 180 official currencies (Swiss Association for Standardization, 2019).

While the inventor of first cryptocurrency Bitcoin, Satoshi Nakamoto, was anonymous, currently world recognized people and companies are eager to issue Initial Coin Offering (hereinafter - ICO). A group of financial firms lead by UBS bank is planning to launch their digital currency, based on blockchain (The Economist 2019), Facebook is launching its cryptocurrency called Libra (The Guardian, 2019).

During past few years, Banking sector revealed, that the system is not efficient enough to implement strict Know Your Customer (hereinafter – KYC) and Anti-Money Laundering (hereinafter – AML) regulations and to prevent the financial system from foreign threats (Barone, Masciandaro 2019; Kordík, Kurilovská 2017; Šimonová, et al. 2019). There were number of cases in Big Scale (Danske Bank 230 billion USD, Swedbank 10 billion USD) and Small scale 4 million USD (Smurfing case in Belgium) (Bloomberg 2019, Bloomberg 2019, EU Observer
2019). Two different approaches of money laundering cases: a) money laundering wholesale, working through several intermediaries with especially big amounts b) money laundering partitioning, when laundered money is divided in small partials to prevent the attention of regulators; shows that the system is not efficient enough.

Limba et al. (2019a, 2019b) define cryptocurrency as infrastructure for critical infrastructure. Therefore the dependence on the quality of the infrastructure for critical infrastructure brings quality for the exact society that is using exact infrastructure. Cambel et al. (2017). The fragility and importance of critical infrastructure are stressed by Tvaronaviciene (2018a, 2018b) as well - “Enhanced resilience of society to critical infrastructure infringement is and the ultimate goal of fostering of leadership for critical infrastructure protection.

The main point of discussion in current time- does cryptocurrency need to regulate by law norms, or it will realize through self-regulation? Another question – would cryptocurrencies make the financial infrastructure weaker and deliver more threats to it? Or is cryptocurrency a tool to evade KYC and AML procedures? Therefore it is important to discuss possible ways of cryptocurrency impact to national security and ways to mitigate risks.

**Actuality** – The European Union is preparing a legal framework for cryptocurrency regulation. Many countries are discussing possible regulations to minimize risks in cryptocurrencies. The actuality of the topic is highly important to discuss risks that cryptocurrency brings to national security.

Authors analyze cryptocurrency phenomena through risk mitigation, which reduce the possible threat to national security. Based on the results of expert interview, the possible interaction between cryptocurrency and AML/ KYC procedures were analyzed.

**Scientific issue** – cryptocurrencies are part of global finance, with the relevant amount of turnover and asset value allocated, however AML and KYC procedures for cryptocurrencies transaction number still in the process of discussion.

**The object of the topic** – KYC and AML procedures versus cryptocurrency: the context of national security.

**The aim of the paper** to disclose possible mitigations of cryptocurrency risks to national security, using KYC and AML procedures.

The **main tasks** of the topic are as follows:
1. To reveal the importance and the need of cryptocurrency as an infrastructure quality improvements;
2. To discuss the need for KYC and AML implementation for cryptocurrency;
3. To emphasize obstacles and challenges for KYC and AML implementation for cryptocurrencies

**Methodology:**
- The method of document analysis was used: selected and analyzed scientific literature, legal documents, and expert conclusions. The literature was selected based on keywords from reliable sources of information (monographs, peer-reviewed scientific journals, information accesses of state institutions). Data analyzed by content analysis.
- The linguistic method was applied to identifying the content of concepts and definitions.
- The systematic method revealed cryptocurrency phenomenon as a digital representation of value, which is accepted by natural or legal persons as a means of exchange and which can be transferred, stored and traded electronically.
- The methods of critical-analytical and comparative analysis were applied to formulating interim and final conclusions.
- An expert interview was conducted to reveal systemic, in-depth features of the cryptocurrency phenomenon.
2. Literature review

For literature review authors have chosen few lines to discuss a) cryptocurrency risk to national security b) the importance of cryptocurrency environment quality c) the integrity of cryptocurrency and shadow economy d) ways to improve cryptocurrency quality from a perspective of national security e) challenges regulating cryptocurrency.

Cryptocurrency risks to national security. According to Tvaronaviciene (2018), cybersecurity threats to national economies has a wide range of facets as: a) internet and terrorism b) exploitation of social networks for various purposes b) manipulation of voting c) attack on institutions of critical importance. Limba et al. (2019a, 2019b) state that cryptocurrency influence national security in various ways. The matrix influence reflects the depth and volume of the interaction of cryptocurrencies and national security. As cryptocurrency is the infrastructure for critical infrastructure from a perspective of cyber threats it is critical infrastructure for digital shadow economy (Table 1).

Table 1. Cryptocurrency threat to National Security risk classification

<table>
<thead>
<tr>
<th>I. Cryptocurrency as an infrastructure for criminal activity</th>
<th>II. Threats to economic security</th>
<th>III. Threats to public security</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. A tool for criminal activity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. An Internet platform for drug dealers</td>
<td>A. Illegal trade activity</td>
<td>A. Organized crimes:</td>
</tr>
<tr>
<td>B. Illegal trade in wide meaning</td>
<td>B. Tax evasion:</td>
<td>• drug trafficking;</td>
</tr>
<tr>
<td></td>
<td>• illegal finance-banking</td>
<td>• crime (illegal. activity;</td>
</tr>
<tr>
<td></td>
<td>• money laundering;</td>
<td>• money theft;</td>
</tr>
<tr>
<td></td>
<td>• tax fraud;</td>
<td>• criminal fraud;</td>
</tr>
<tr>
<td></td>
<td>• money transit.</td>
<td>• tax evasion and tax</td>
</tr>
<tr>
<td></td>
<td>C. Tax evasion:</td>
<td>fraud.</td>
</tr>
<tr>
<td></td>
<td>• money laundering;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• money layering;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• money transit.</td>
<td></td>
</tr>
<tr>
<td>2. As an object of criminal activity</td>
<td>2. Indirect forms</td>
<td>C. Corruption.</td>
</tr>
<tr>
<td>A. Money theft</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Criminal fraud activity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Corruption</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Direct forms</td>
<td>2. Indirect forms</td>
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<tr>
<td>1. Direct forms</td>
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<tr>
<td>1. Direct forms</td>
<td></td>
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<tr>
<td>Source: Limba et al. (2019)</td>
<td></td>
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</tr>
</tbody>
</table>

According Limba et al. (2019), cryptocurrency as infrastructure brings the following potential risks: a) money theft, b) a lack of arbitrage, c) money laundering, d) tax avoidance, e) financing terrorism. Tvaronaviciene (2018) states “main efforts should be taken to provide security for their critical infrastructure because only this can ensure the wellbeing of the country and its people”.

The importance of cryptocurrency environment quality. According to Tvaronaviciene (2018) “contemporary environment in conditions of globalization predicting of development peculiarities and external factors’ impact becomes an especially urgent issue”. Stankevicius et al. (2018) stated, that “critical infrastructure system has a dynamic, evolutionary character in the context of social change”.

The integrity of cryptocurrency and shadow economy. Limba et al. (2019a) state “negative factors of cryptocurrency are typical (homogeneous) for most countries”. If negative factors are homogenous, ways to mitigate negative factors are homogenous as well. Besides urgency globalization brings need to cooperate building and fulfilling norms of activities as Štitilis et al. (2016) stress the importance of cybersecurity international integrity.
development. Scientists emphasize that cybersecurity shall be developed in two levels: 1) locally 2) global cooperation of cybersecurity development. Desmond et al. (2019) findings are that “the cryptolaundering process is considered to be a complex socio-technical system”. Novikovas et al (2017), states, that “countries must feel concern regarding consolidation of their security”. However despite the need of global integrity and cooperation according to Zetzsche et al. (2018) “There is a strong differentiation of treatment among countries and low levels of legal certainty”.

Ways to improve cryptocurrency quality from a perspective of risks to national security. Limba et al. (2019) state that lack of AML and KYC procedures in cryptocurrency case increase terrorist act risk. Therefore it is essential systematically develop research interaction between disruptive technologies (including Bitcoin – authors remark) and cybersecurity. Barone et al. (2019) and Danton (2014) determines anonymity and lack of control as a key money laundering elements. Clayton (2018) as a chairman of US Securities and Exchange Commission determined that KYC and AML procedures should be a must for ICO.

Challenges regulating cryptocurrency. Tkachenko et al. (2019) define that in Bitcoin – based system there is no possibility to ban the transfers immediately; there is only a possibility to regulate intermediaries or to implement penalties after the transactions are done. Authors identify as well, that Bitcoin – based system is a new type of financial infrastructure, therefore a new type of lawmaking and law enforcement is needed. Tu et al. (2015) after modelling cryptocurrency under existing US framework came to the conclusion that the development of an efficient regulatory regime for cryptocurrencies requires great interagency communication of regulatory consideration raised by virtual currency.

Also mentioned, that cryptocurrency is an infrastructure for new kind of money – laundering practices. In one hand ES brings sanctions for some subjects, outside EU borders, but now day exist paradox - “dirty” money layout in EU countries.

Money launderers break down a large amount of money into smaller chunks and have associates known as “Smurfs” deposit the funds in different accounts in different places. For example Belgium case: to avoid transparency, the criminal group paid out in sums of €10,000 to €120,000 to Belgian suppliers of construction materials and engineering equipment, such as flooring, heating, lighting, and ventilation systems (EU Observer, 2019).

Summarizing we can state that cryptocurrency as critical infrastructure for critical infrastructure and critical infrastructure for digital shadow economy. The quality of cryptocurrency environment is high importance and urgency, therefore, risk mitigations should be implemented to improve its quality and to prevent risks that could have long-term impact on certain society. Despite the need for global cooperation implementing efficient instruments to improve the national security environment, there is a lack of Instruments for cryptocurrency quality improvement should be implemented globally to be efficient enough.

3. Qualitative Analysis of Cryptocurrency as a Threat to National Security

3.1. Research Methodology

The main tasks of the research are as follows: to analyze cryptocurrency as an instrument for money laundering, influencing national security from a practical professionals point of view, the authors applied The interview method. Qualitative analysis pros: deep and detail; openness to generate new ideas and theories; opportunity to see the world through investigator position and opportunity to avoid prejudices.

The cons of the study: difficult to structure and to generate received data; the study is strongly dependent on investigators experience, abilities and skills, which is impossible to measure.
Cohen, Manion (1989), Tidikis (2003) indicates a threefold purpose of the research interview method:
1. Direct tool to get the required information.
2. Measure the hypotheses raised in check.
3. Interview in conjunction with other methods can be used to gather information and consideration of other methods.

Interview object: a) cryptocurrency as social phenomenon b) cryptocurrency as an infrastructure influencing national security c) perceived ways to minimize risks carried by cryptocurrency c) determine either the perceived view of top position people has the same direction.

The interview was followed by quality criteria of Kvale (1996):
a) The extent of spontaneous, rich, specific, and relevant answers from the interviewee.
b) The shorter the interviewer’s questions and the lauder the interviewer’s answers, the better.
c) The degree to which the interviewer follows up and clarifies the meanings of the relevant aspects of the answers.
d) The ideal interview is to a large extent interpreted throughout the interview.
e) The interviewer attempts to verify his or her interpretations of the subject’s answers in the course of the interview.

The interviews were made in July 2019. Four interviews lasted about 60 minutes, one interview – 30 minutes. Before the interview, the interviewers were explained about the research object and the context. The interview is ‘self-communicating’ – it is a story contained in itself that hardly requires much extra descriptions and explanations.

According to Crouch et al. (2006), “Small number of cases will facilitate the researcher’s close association with the respondents, and enhance the validity of fine-grained, in-depth inquiry in naturalistic settings”. Libby and Blashfield maintain the same position. Cohen et al. (2007) keep a position that “the interviewer will need to establish an appropriate atmosphere such that the participant can feel secure to talk freely”. To prevent political speculations, to reach higher transparency of interviews and to get open position on the cryptocurrency the interviews are anonymous. Respondents were informed about interview confidentiality and the interview was not recorded. Also according to Kvale (1996) “the researcher is the research instrument, the effective interviewer is not only knowledgeable about the subject matter but also an expert in interaction and communication”. Therefore most of the interviews were structured as informal. During the interview, a few topic lines were developed to reveal problematic issues. All participants were willing to assist in the investigation.

The interview was started from the respondent opinion about the cryptocurrency itself, to get main ideas the way the respondent sees cryptocurrency and to get the most open view on cryptocurrency. Latter respondents were asked to identify potential risks that cryptocurrency can bring in terms of money laundering and the threat to national security. At the end of the identification of cryptocurrency risk, the position regarding cryptocurrency regulation was asked to be determined, to get an overall view of the interviewee. All respondents were asked the same questions.

Received information was analyzed applying content analysis method. Content analysis is a procedure for the categorization of verbal or behavioral data, for purposes of classification, summarization, and tabulation. According to Wamboldt B.D. (1992), “content analysis has external validity as a goal. Because of its focus on human communication, the content analysis offers practical applicability, promise, and relevance for research.”
3.2. Characteristics of elements participating in interview

For the interview, we were targeting top position individuals involved in Banking, Legislation (National Security) and cryptocurrency operations activity. All respondents run top positions, participates in political and social activity. One respondent is actively performing in the cryptocurrency market and is an owner of the company, which listed ICO.

The structure of the interview was based on the literature review. However, the main goal was to get an individual view on cryptocurrency, the depth of understanding it as a product, the individual understanding as a threat to national security and the perceived need to regulate it.

Two participants are financial industry professionals and have high cryptocurrency. Both participated in international and local conferences. Both respondents are well informed about existing regal regulations concerning cryptocurrency and participate in discussions to regulate it.

One participant has an extremely deep understanding of cryptocurrencies. The participant has activity in mining, selling, trading, arbitraging from cryptocurrencies and issuing ICO. The respondent is familiar with banking rules for KYC and AML applied for customers as well.

It is important to mention that one participant has a rather modest understanding of cryptocurrency. He stated that during Parliament work he did not participate in any discussion or any report for government institution related to external, internal threats were not discuses. However, the responded stated that he had participated in an international security conference where the discussion took place about cryptocurrency as a threat to national security. Therefore he assumes cryptocurrency potential having an impact to national security.

To obtain information from a wider circle of participants who are concerned with cryptocurrency, interviews were interviewed persons whose activities are related to legislation and practice activities (see Table 2, Table 3).

Table 2. The Sample Description

<table>
<thead>
<tr>
<th>Group</th>
<th>Occupation</th>
<th>Working experience</th>
<th>Approximate age and sex</th>
<th>Means of Interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banking</td>
<td>CEO/OWNER</td>
<td>Bank activity supervision including operations, KYC and AML compliance</td>
<td>Man, about 35 years</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Banking</td>
<td>CEO</td>
<td>Actively participates in Banking sector lobbying including legislation and regulation</td>
<td>Man, about 47 years</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Cryptocurrencies</td>
<td>CEO/OWNER</td>
<td>Owner of company which has listed own cryptocurrency</td>
<td>Man about 28</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Legislator</td>
<td>Member of Parliament</td>
<td>Legislator, participant of National Security Committee</td>
<td>Man, about 55 years</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Legislator</td>
<td>Member of Parliament</td>
<td>Legislator, participant of National Security Committee</td>
<td>Man, about 37 years</td>
<td>Face-to-face</td>
</tr>
</tbody>
</table>
### 3.3. Interview results

<table>
<thead>
<tr>
<th>Storyboard</th>
<th>Examples of interview</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Position regarding cryptocurrency as money laundering instrument</strong></td>
<td>“Cryptocurrency – the main instrument for money-laundering”&lt;br&gt;“No control during cross border transactions”&lt;br&gt;“No paths of transaction”&lt;br&gt;“Cryptocurrency – an instrument for illegal activity”&lt;br&gt;“Cryptocurrency – is used for money-laundering cases”&lt;br&gt;“Custom does not check if You have virtual wallet with 100 million USD when You travel”&lt;br&gt;“Instrument for money-laundering”&lt;br&gt;“No data is reported to crime prevention organizations about cryptocurrency transactions”&lt;br&gt;“In case of money laundering investigation in cryptocurrency case is hard to get data about participants and transactions”&lt;br&gt;“If someone is virtual millionaire in cryptocurrency he or she would need to convert money into real money to buy real things (houses, cars fancy things). Then the information is gathered, and checked the source of money origin”&lt;br&gt;“Money laundering is mitigated when cryptocurrency is converted to real money and/or buying real estate or assets that are under register”&lt;br&gt;“Cryptocurrency is a “grey zone” area with uncontrolled and unknown activity and participants (authors remark)”</td>
</tr>
<tr>
<td><strong>Respondent view on Cryptocurrency as a Risk to National Security</strong></td>
<td>“The black market in the internet is based on cryptocurrencies”&lt;br&gt;“Using cryptocurrency as a mean of payment, illegal things are available to buy”&lt;br&gt;“Cryptocurrency bring risk to national security, tax evasion, illegal good transit”&lt;br&gt;“Cryptocurrencies are used as an for Blackmailing”&lt;br&gt;“Cryptocurrency is not a threat to national security itself but it is the threat the way it is adopted”&lt;br&gt;“Illegal activities and organized crime is strongly using cryptocurrency as a mean of transaction therefore it brings a lot of risks to national security”&lt;br&gt;“Black market is based on crypto currencies”&lt;br&gt;“Cryptocurrency might be used as an instrument to induce chaos in the country”&lt;br&gt;“Cryptocurrency bring risk to national security”&lt;br&gt;“Risk to national security is seen as a risk to financial security which is considered as low”&lt;br&gt;“Perceives cryptocurrency as an instrument for terrorist activity”&lt;br&gt;“Risk mitigator is the place where cryptocurrency holder wants to exchange his virtual assets to FIAT currency”</td>
</tr>
<tr>
<td><strong>Perceived respondent view on cryptocurrency regulation</strong></td>
<td>“Regulation is necessary”, “big scale of people who would be negatively affected”&lt;br&gt;“The KYC procedure during cryptocurrency account opening do not prevent from further money laundering, as accounts can controlled by third parties”&lt;br&gt;“Local regulation would not be efficient unless regulation is implemented in comparing relevant part of states”&lt;br&gt;“The right of cryptocurrency issuance should be controlled by the governemnt, who has a right to issue money”&lt;br&gt;“High need to regulate cryptocurrency market”&lt;br&gt;“The question is who would be eligible to regulate cryptocurrencies and in what way”&lt;br&gt;“No one can stop Bitcoin transactions as it is virtual data flow performed autonomously”&lt;br&gt;“Bitcoin can be allowed or forbidden but no regulation is possible due to its nature of autonomy”&lt;br&gt;“Exchange markets should take position of gathering information, making KYC and AML procedures”&lt;br&gt;“No need to regulate cryptocurrencies”&lt;br&gt;“It would be regulated within existing legislation when converting cryptocurrency to FIAT currency”&lt;br&gt;“Local cryptocurrency regulation would not be efficient as it is a global product”&lt;br&gt;“Possible cryptocurrency regulation not earlier than in ten years”&lt;br&gt;“The necessity to regulate is a matter of time”</td>
</tr>
<tr>
<td><strong>Other aspects of discussion arisen from the interview</strong></td>
<td>“If people who pay 10 000 EUR for Bitcoin – pay for anonymity, then it is a huge bubble”&lt;br&gt;“The cryptocurrency price is based on global community answers to following questions: a) Is it legible to claim state write to issue money b) Is the value of cryptocurrency is reasonable c) Cryptocurrency regulation leads to state exclusivity for cryptocurrency issue”&lt;br&gt;“Cryptocurrency value is based on speculations”</td>
</tr>
</tbody>
</table>

*Source: Respondent Interview made by authors*
3.3.1 Thematic study topic: cryptocurrency is an infrastructure for money laundering

All participants see cryptocurrency as the main instrument for money laundering. Respondents mention cross border transactions as important risk carriers as they see cryptocurrency as riskier than cash money as there is no custom to check international money flows. The position is supported by the Financial Crimes Investigations Bureau - cryptocurrencies are obtained virtually, therefore, counterparties do not need to meet fiscally, therefore it is an attractive instrument for fraud cases, money laundering and legalization for illegal money (www.Alfa.lt 2018).

The importance of money laundering is also related to investigations of money laundering cases. Due to cryptocurrency origin, it is hard to determine its path and the origin it comes. Government institutions do not record or gather information about cryptocurrency transactions. The same as money laundering investigations, which are difficult, due to information limitations.

3.3.2 Thematic study topic: cryptocurrency brings risk to national security

All respondents have a common strategic view that cryptocurrencies are a threat to national security. However, the extent of risks is considered to be the area of discussion (Table 4).

Table 4. Respondent opinion whether cryptocurrency brings threat to national security

<table>
<thead>
<tr>
<th></th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of respondents</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: Respondent Interview made by authors

Although all participants agree that cryptocurrency is a mean of exchange in the Black Market and an instrument to buy illegal things, there was only one position saying that controlling exchange houses of cryptocurrencies to FIAT currencies would be a relevant risk mitigator to prevent crimes.

Institutions highlight the relevance of cryptocurrency as a threat to national security as well (The President of the United States, 2017), Lithuanian Bank (2017) declares that “In no mean we cannot create the illusion that cryptocurrencies are maintained by the bank and therefore safe” and “the participants of the financial sector should not participate in cryptocurrency selling, they should ban their customers to use cryptocurrency as a mean of payment”. International cryptocurrency transactions show possible users from high-risk countries (Syria, Iraq, Iran, Yemen, Tunisia and etc) and high-risk users (members of criminal cartels, terrorists), states Financial Crime Investigation Bureau (www.Alfa.lt 2018).
3.3.3. Thematic-study topic: Possibilities to regulate cryptocurrency

Four out of five respondents see the need to regulate crypto currencies. One is considering that existing regulations are enough as, despite obstacles to get information about cryptocurrency holders, there is always a way to control the origin of money.

Important to mention that part of respondents were rather pessimistic in KYC and AML procedure implementation for cryptocurrencies due to: a) possible transfer of accounts to third parties b) it is impossible to stop cryptocurrency transactions c) local or fragmented regulation would not be efficient for a global IT product d) unclear regulators for the instrument (Table 5).

Table 5. Respondent Opinion on Need to Regulate Crypto Currencies

<table>
<thead>
<tr>
<th>Must</th>
<th>Not necessary</th>
</tr>
</thead>
</table>

Source: Respondent Interview made by authors

3.4. Generalizations

Respondent statement data analysis disclosed consistency of respondent opinions, and revealed the following guidelines for discussion:

1. All participants agree that cryptocurrency is an infrastructure for money laundering. The scale and depth of discussion about the ways money can be laundered through cryptocurrency dependent on understanding the way cryptocurrency operations can proceed. The more respondent was aware of cryptocurrency operations the more

2. All participants agree that cryptocurrency is a threat to national security. All participants named one or few risks that cryptocurrency brings to national security.

Summarizing respondent position it is obvious that the respondent has a homogeneous view on cryptocurrency as an instrument for money laundering and as a threat to national security. The homogeneity is based on the following factors presented below (Table 6).
### Table 6. Research outcome summary

<table>
<thead>
<tr>
<th>National security</th>
<th>From money laundering aspect</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I Anonymity</td>
</tr>
<tr>
<td>a) Illegal good trade</td>
<td>a) No paths of transaction</td>
</tr>
<tr>
<td>b) Tax evasion</td>
<td>b) Equivalent of cash money</td>
</tr>
<tr>
<td>c) Blackmailing keeping the confidentiality of the criminal;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>II Lack of transaction control</td>
</tr>
<tr>
<td>a) No ability to stop illegal operations</td>
<td>a) No cross border transaction control</td>
</tr>
<tr>
<td>b) Tax evasion</td>
<td>b) No paths of transaction</td>
</tr>
<tr>
<td>c) Instrument to induce chaos in the country</td>
<td>c) No transaction data reported to institutions</td>
</tr>
<tr>
<td>d) Potentially able to influence financial market stability</td>
<td></td>
</tr>
</tbody>
</table>

Source: Respondent Interview made by authors

Therefore the finding are that cryptocurrency as a threat for national security and money laundering cases, value drivers are I) anonymity II) lack of transaction control.

### 4. KYC and AML Practical Adoption in Banking Sector and for Crypto Currencies

Developing risk mitigations for the cryptocurrency market it is relevant to the overview Banking sector, therefore, it is relevant to make an overview of the Banking sector regulatory framework.


- not issued or guaranteed by a central bank or a public authority;
- not necessarily attached to a legally established currency;
- not possess a legal status of currency or money;
- but is accepted by natural or legal persons as a means of exchange and which can be transferred, stored and traded electronically;

At that time scientist were discussing, that “Policy makers hope that the risk-based approach will help reduce the number of poor quality reports and improve the quality of intelligence provided to FIUs. Nevertheless, the question of how to identify risks remains.” (Gelemerova, 2009).

Banking KYC and AML process are presented in the table below. It is a four-level process which includes primary risk assessment of the customer, constant due diligence of the customer, then gathered information in the first stage is compared to the customer on-going transaction follow up. Is the customer in line with its declared activities, money origin, money turnover, etc. Finally due all stages of the operations information is shared with authorities if there are potentially risky transactions (Table 7).
Subbotina (2009) determined that even Banks having strict requirements for AML and KYC procedures sometimes partially violates it. From the survey we can see that in all cases Bank has dedicated employees for AML procedures, however, breaches are related with the responsible employee that is responsible for AML and KYC compliance usually has other responsibilities, sometimes employees do not update information or report after the deadlines. The survey shows that even having strict regulation under the central bank and within the bank itself KYC and AML procedures are breaches or can be breached due to operational mistake.

During the past few years, there was a row of money laundering cases in Banking sector: Danske Bank – 230 bln. USD (Bloomberg, 2019), Swedbank 10 bln. USD (Bloomberg, 2019), Nordea 405 mln. USD (Bloomberg, 2018), ABLV 102 mln. USD (The Baltic Course, 2018, Latvian Television, 2018). The money laundering cases were related to North Korea nuclear programme funding, money laundering by politicians and Russian citizens that are on the EU and USA sanction list. Unlike the Bitcoin Banks are listed in stock exchange, internal and external (BIG 4) auditors audit their financials, local authorities and ECB supervise them.

The outcome of Danske Bank independent auditors Brune & Hjejle (2018), is large scale money laundering case was caused by a) inadequate KYC procedure fulfilment b) inadequate AML procedure fulfilment c) lack or response of reporting personnel.

The tendency of KYC and AML implementation shows, that scientist hypothesis (Alldridge 2008, Gelemerova 2009, Subbotina 2009) regarding procedure implementation issues is confirmed by practical big scale money laundering cases, which are backed by institutional auditors Brune & Hjejle (2018) report.

The data of the money laundering cases should be used to make amendments in legislation of money laundering supervision. The fraud cases shows that the AML and KYC procedure implementation for Banks are still needed for improvements (Table 8).
Table 8. The process of Legislation issuance in financial sector and need of improvements

European commission has released 5th Money Laundering directive, which, will ”limit the anonymity related to virtual currencies and wallet providers” (European Commission 2019). According European parliament decision (2018) it appears that there is background for risk mitigation implementation in Europe as KYC and AML procedures shall be implemented in custodian wallet providers and cryptocurrency – fiat currency exchanges. The Member States must transpose this Directive by 10 January 2020. Therefore it is expected that the risks related with KYC and AML procedures will be implemented in cryptocurrency market. European commission is considering that “These amendments introduce substantial improvement to better equip the Union to prevent the financial system from being used for money laundering and for funding terrorist activities.”

Outstanding risks in cryptocurrency market shows, initial coin offering (hereinafter - ICO) cases. Ten biggest initial coin offerings from its release date caused at least 6.6 billion USD losses for its investors. The table shows that despite known companies, like Telegram or Petro cryptocurrency (supported by Venezuelan president Maduro), the results of biggest ICO revenues are very bad or not available. Value change in companies from the beginning of ICO (fund rise) up to the date of research 2019 07, shows that in all cases we see rapid decease in price (Table 9).

Table 9. Biggest ICO raised funds in Million USD and Value change from release up to date

<table>
<thead>
<tr>
<th></th>
<th>HDAC Technology</th>
<th>Telegram</th>
<th>Petro</th>
<th>TaTaTu</th>
<th>HDAC</th>
<th>Filecoin</th>
<th>Tezos</th>
<th>Sirin Labs</th>
<th>Bancor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Million USD</td>
<td>6 580</td>
<td>1 700</td>
<td>735</td>
<td>575</td>
<td>258</td>
<td>257</td>
<td>232</td>
<td>158</td>
<td>153</td>
</tr>
<tr>
<td>Value change</td>
<td>-80%</td>
<td>n.a.</td>
<td>n.a.</td>
<td>-94%</td>
<td>-77%</td>
<td>-72%</td>
<td>-78%</td>
<td>-94%</td>
<td>-88%</td>
</tr>
</tbody>
</table>

Source: Bloomberg, 2018

However authors consider that cryptocurrency risk mitigations shall be observed in the near future as well as the KYC and AML implementation. As research showed that more likely implementation of KYC and AML implementation shall be challenging as Banking industry which is regulated by the same EU directive is still facing need for improvements.

Moreover cryptocurrency is a digital product and its KYC and AML implementation differs from other financial instruments therefore its would additionally face following challenges:

- It is unclear which institution will be able appropriately control procedure implementations;

Source: made by authors
It is unclear whether competences of the supervision institution will be relevant for implementation of KYC and AML procedures for IT-based financial tools (cryptocurrency – authors remark);

Would it be efficient to implement KYC and AML procedures locally as cryptocurrency is a product of global economy, whereas risks and mitigations are homogenous for all countries?

Cryptocurrency transactions cannot be stopped due to its autonomy.

Conclusions:

The research showed that regulation is necessary for the cryptocurrency market although legal regulation was not the aim of the research. Authors emphasize that appropriate KYC and AML procedures implementation would have an impact on cryptocurrency risks integration.

The KYC and AML procedures are necessary steps to mitigate risk carried by cryptocurrency.

Banking case study of AML and KYC procedures showed that despite of existing procedures, there are still outstanding risks in procedure implementation and follow up, therefore it is important to execute further observation of KYC and AML procedure implementation execution.

The research showed that there might be obstacles to implement KYC and AML procedures as a) cryptocurrency is a product of global market b) there is no possibility to stop Bitcoin transaction due to its autonomy c) cryptocurrency is a new form of financial product having IT-based operating model, therefore new competences shall be needed to implement appropriate KYC and AML regulations.

References


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DO THE CRIME AND THE SOCIOECONOMIC STRAIN AFFECT THE ECONOMIC GROWTH? A CASE OF AN EMERGING ASEAN ECONOMY

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Abstract. The key purpose of this research is to explore the nexus between crime, socioeconomic strains and the economic growth of Thailand. The study has used the ARDL technique to achieve the objectives of the study. The finding revealed the fact that the roles of crime have been well emphasized in the literature, especially on how it acts as a stoppage on the progress of the economy in terms of growth. A crime committed in the economy incurs more expenditure and causes the mobility of highly skilled labour which is worse than the formal labour market. Socioeconomic strains have similar dimensions of impacts on crime variables regarding the positive relationship based on the above results. Deterrence variables performed as expected on other crime variables except on person’s crime. Family instability showed a positive impact on property crime. The extent that socioeconomic strain affects crime variables has shown that the strain of frustration, anger and stress in people are exhibited in the social and economic factors that prevail in Thailand. Individuals facing economic hardships brought by socioeconomic factors would innovate alternative means to survive.

Keywords: crime; socioeconomic strains; economic growth; Thailand.


JEL Classifications: F43

1. Background

Crime-related issues have been identified as a threat to budget actualisation by the Thailand Government (Suksamran, Trimek, Jermsittiparsert, & Siriattakul, 2017). This threat of crime is manifested in the form of violence, arson, false pretense/cheating, unlawful possession, robbery, assault, murder, theft, destruction, fraud and corruption in the country (Jermsittiparsert, Trimek, & Vivatthanaporn, 2015; Jermsittiparsert & Akahat, 2016; Jermsittiparsert & Ruangsilp, 2017). In the 2014 budget presentation, fraud in pension administration, corruption, destruction of property and theft were seen as the reasons for the increased costs of governance over time. In addition to the direct costs of these various crimes, the government also bore the social costs of crime including arrests, prosecution and fixing of properties. In turn, increased costs of governance may jeopardize development objectives like the drive for economic growth, improving income inequality and alleviating poverty. That is because the business and economic outlook in a crime-prone environment may not promote economic development due to the emigration of investors The United Nations Office on Drug and Crime (UNODC) (2005) asserted that crime is threatening the economic performance of ASEAN countries. This is because various crimes are pervasive across the continent including homicide, harassment and assault, bribery and corruption, and other crimes like armed robbery, fraud and money laundering. Even the rates of suicide are high in Asia. Indeed, the
suicide rate in low and medium-income countries in the ASEAN region increased by 38% (% change in suicide rate per 100,000 population) from 2000 to 2012 (World Health Organization, 2014).

The crime rates in Thailand and other ASEAN countries seem to confirm the UNODC (2005) view on the reporting of crimes in ASEAN countries, which is crime victims are often reluctant to report crime. For instance, a survey carried out on the national level in Thailand by the National Bureau of Statistics (NBS) in 2007 showed that the majority of crime victims believed that it was not worth reporting crime to the police. Furthermore, crimes are underreported because crime cases are not handled properly by the police in Thailand (Ayodele & Ogunjuyigbe, 2015; Okenyodo, 2016; Ab Rashid, Supian & Bojei, 2018) and of fear of retaliation by the offenders on the victims (Ayodele & Ogunjuyigbe, 2015). Nonetheless, the fact that crime is underreported in Thailand does not prevent this study from examining crime based on the available data. There are four reasons: firstly, crime contributes to a high number of death rate in the country (Nwankwo & James, 2016; Ojedokun, 2014) and this culminates to wastage of resources and human potentials. For instance, the number of killings due to armed robbery activities contributed 50% of 8,516 deaths in 3,840 lethal incidents from 2006 to 2015 in Thailand (Nwankwo & James, 2016; Abdulrasheed, 2017). Likewise, many news have affirmed that crime and conflict cause an average death per person of 1,655 between 2006 and 2011. In addition, several number of policemen were murdered by militants and armed bandits (Ojedokun, 2014), the crime rate in Thailand is second highest among the ASEAN countries as shown in the figure1.

Secondly, the shocks caused by criminal activities spate up insecurity and threats to citizens and properties in the country (Ayodele & Ogunjuyigbe, 2015; Krakrafaa-Bestman, 2018). As the oil exploration investment in the region is affected by the threat of extortions, killings, raping and abduction of foreign and local people with payment of ransom (Krakrafaa-Bestman, 2018). To add, the criminality in unrest and insecurity pervaded the north-eastern part of the country caused destruction of infrastructures and by extension of anxiety to the whole country. Local businesswomen suffered a high level of crime victimization which involve rape and theft of money, food items and moveable economic items (Ayodele & Ogunjuyigbe, 2015).

Thirdly, crime stigmatises the nation internationally which portray the country as unsafe for investors (Adekoya, 2017; Kordík, Kurilovská, 2017; Adisetiawan, 2018). Since theft, cyber-crime, advance fee fraud and false pretence/cheating create loss of confidence. False pretence/cheating constitutes 49.57% of cases convicted by the Economic and Financial Crimes Commission (EFCC) in 2013 (EFCC, 2013). Lastly, crime increases
the cost of governance in the country (FMFN, 2014). This is because needed resources that should have been
invested to boost output, health, agriculture and other welfare programmes are diverted to crime control and
prevention (Petreski et al., 2018). For example, from 2010 to 2013, the government expenditure on internal
security was 7.43% while that of education and health stood at 7.96% and 4.72%, agriculture was 2.21% as
road and construction remained at 5.70%. Expenditure on internal security in this period was almost equal to
education, but outweighed agriculture and health if put together, and also more than road and construction. The
divergence of fund from health, agriculture and other crucial area in the country is disadvantageous to national
development (Petreski et al., 2018).

Thus, the means to increase the peace and welfare of citizens required an examination of the root causes of that
crime so that it might be reduced. The crime ascribed to the above mentioned reasons are overall crime, person’s
crime (murder, felonious wounding and other crime against persons which include rape, kidnapping and others)
and property crime (armed robbery which include robbery and extortion, burglary which include house/store
breaking, and false pretence/cheating).

2. Theoretical and Empirical Review

The socioeconomic strain was conceptualized as a structural framework to examine how the strain of living
in a community can adversely affect their overall quality of life, work and living conditions (Adekoya, 2017;
Naushad et al., 2018; Kowo et al. 2019; Prakash, Garg, 2019). A lack of jobs, poor earnings and limited
opportunities accompanied by a high level of poverty are considered symptoms of socioeconomic strain. Thus,
symptoms of socioeconomic strain manifest themselves more in less advantaged groups of people. This is because
less advantaged group of people have low physical, emotional and behavioral health due to more stress and
fatigue when compared with their counterparts that are more advantageous in status wise. This study considers
socioeconomic strain as the existence of factors that encourage envy, stress, fatigue and low morale in the
economy. Among these factors are the interrelated factors of unemployment, income disadvantage and poverty
(Adekoya, 2017; Sriyana, 2019). Persistent unemployment leads to a whole cascade of negative consequences.
One of these is that persistent unemployment is related to an ultimate reduction in skills and knowledge,
and low education is linked to continued poverty (Horan & Widom, 2015; Ahmad, 2018). Also, it increased
financial adversity and in turn, made family to experience instability. The family instability manifested in the
form of separation and divorce which further led to poor parenting (Smith, Crosnoe, & Cavanagh, 2017). This
disadvantage begins early in life, income disadvantage families have lowered probabilities of good educational
opportunities for their children (Merrifield, 2017). Thus, children from poor households are educationally
disadvantaged compared to those from wealthier households (Hall & De Lannoy, 2015; Caplinska, Ohotina,
2019). Children from income disadvantage families start school late, which reduces their ultimate educational
outcomes (Merrifield, 2017).

Poverty of resources and consumption opportunities force poor households to engage in the low-level
employment in order to meet their daily needs. This is because consumption is used to measure the material
well-being in developing countries. Most people from income disadvantage families have access only to lower
quality health care, which, in turn, results in higher mortality (Schmeer & Yoon, 2016; Ali, 2017). Thus,
income disadvantage is taken as an inverse of the logarithm average income per population (Adekoya, 2017).
The prevalence of socioeconomic strain of stress, fatigue and pressure that citizens face as challenged in their
daily lives is pronounced in Thailand. For instance, Ibikunle, Umeadi, and Ummunah (2012) said that a low
level of satisfaction existed among workers due to poor salaries, which made workers emotionally exhausted.
Author said that decreasing economic opportunities and the build-up of heterogeneity of the high- and medium-
rent areas led some migrants in Lagos to commit crime. Migrants facing economic deprivation resided mostly
in income disadvantage residences, and they found more incentives to commit crime in the residential areas of medium- and high-income residents. Alabi and Durowaiye (2018) concluded that unemployment causes
criminal behaviour. Also, Adekoya (2017) established that the involvement of young adults in criminal undertakings is encouraged by their high level of poverty, poor employment opportunities and income, and
low family values.
Besides, Torruam and Abur (2014) argued that unemployment lowers people’s morale in the economy structure, and the low morale induces them to source for alternative means of income legally or illegally. Thus, the evidence of teenagers and young adults committing crime due to socioeconomic issues in Thailand has been challenging (Adekoya & Razak, 2016). To address those challenges of socioeconomic strain, research is required. This study examines unemployment, income disadvantage and poverty as socioeconomic strain factors in relationship to criminal activities in Thailand. The investigation of these factors is based on four principal reasons. First, a growing population in Thailand is facing economic hardship and deprivation due to poor employment income. Second, a vast number of the working age population that are either unemployed or underemployed may have their children denied good access to education. Third, denying children access to education ensures the continuation of poverty in the country, and last, the consequences of socioeconomic strain must be avoided if possible or at least minimised for sustainable security, peace and welfare of the Thailand citizens.

Economic growth has been traditionally conceptualized as an increase in per capita income, but the means to achieve economic growth has remained the subject of contentious debate in the literature. The contention has been centered on the sufficiency of investment to drive growth rate. Berg (2016) and Khandelwal and Joshy (2017) gave priorities to capital accumulation as a major drive of a nation’s economic growth due to its dualistic role in the economy. That is, capital accumulation is used to generate income and increase productive capacity in the economy. While income generated creates more demand in the short run, the productive capacity expands the supply in the long run. A necessary condition required for economic growth is that income generated through spending should adequately clear the generated output through an increase in capital stocks to avoid idle production capacity. Fulfilling this necessary condition would guarantee full employment, and consequently, steady growth would be achieved in the long run.

2.1. Socioeconomic Strain and Crime

In establishing the link between socioeconomic strain and crime, some economic variables can be adequately measured directly while others would have to be considered more indirectly. In this study, socioeconomic variables are considered in terms of their influence in causing various types of crime. The idea of strains is that an economic variable may exert pressure on individuals to commit a crime, and, at the same time, an economic variable may serve as a motivational incentive to commit a crime. This is in relationship to that fact that the cultural values in Merton strain theory are economically driven based on the American Dream. Thus, a high probability that socioeconomic variables induces crime is based on the available literature discussed below.

2.2. Unemployment and Crime

Researchers have examined various means to increase the opportunity costs of crime. One of the identified means of increasing the opportunity costs of crime is labour market income (Ciocchini, 2017). The argument is that a higher probability of better income in the market would prevent people from committing crime. Also, other works have devoted their time to exploring economic factors that reduce the opportunity costs of crime, especially the time spent not engaging in any meaningful work. They identified reducing unemployment as a means of reducing the opportunity costs of crime (Blasio, Maggio, & Menon, 2016).

Previous studies that have explored unemployment and the relationship with crime have had mixed results. While some researchers obtained a positive relationship between unemployment and crime, others have produced negative (Müller-Buschbaum, 2018) or no results (Tarling & Dennis, 2016). For example, the relationship between unemployment and crime in Italian provinces. The study used a panel data from 2000 to 2005, the panel data estimated with the Generalised Methods of Moment (GMM). Speziale established a positive link between unemployment and total crime with respect to theft, fraud and robbery. The study outcomes showed that juvenile unemployment was positively and significantly related with theft, fraud and robbery. The results, according to Speziale, revealed two things. One, previous experience in criminal activity influenced the decisions to become involve in crime; and two, a low efficiency of the legal system encouraged the increase in criminal activities.
Thus, Speziale’s study provided support for the rational choice theory in two areas. First, efficient deterrence to crime is required increase the opportunity costs of crime. Second, unemployment served as motivational factor for crime. Other researchers have also examined the relationship between crime and unemployment, but the results have been mixed. Müller-Buschbaum (2018) found a negative significance between some types of crime and unemployment. Tarling and Dennis (2016) could not find a link between unemployment and crime in Scotland.

The reciprocal relationship between unemployment and crime has received the attention of the researchers (Ambrose, Etim, & Enagu, 2016; Shah, Soomro, & Mirjat, 2019). The nature of the argument is that unemployment might increase crime and that the effects of crime might likewise increase unemployment. Thus, criminal activities might increase unemployment in the market when offenders find it difficult to find a job or employment after being discharged from the prison. For example, Shah et al. (2019) argued that unemployment may be increased if convicts find no reason to engage in legal work. Also, crime may discourage the development of new firms, thus limiting the growth of employment in a crime-ridden area. Similarly, firms in crime areas pays high wages to sustain their workers as compensation. Shah et al. (2019) believed that endogeneity issues must be resolved to make estimates valid. Although a positive link between unemployment and crime is possible by controlling for endogeneity, this depends on the choice of control variables included in the model. Shah et al. (2019) examined the relationship between unemployment and crime in the United States. Shah et al. (2019) looked at unemployment and seven felony offenses in the United States with panel data from 1971 to 1997. They found significant positive effects of unemployment on property crime rates and that a substantial part of the decline in property crime rates was due to the decline of the unemployment rate. Rape was weakly related to the employment prospects of males. Similarly, studying unemployment and crime in the United State with panel data from 1974 to 2000, a positive and significant relationship between unemployment and property crime, and other of property crime including burglary and larceny. But, Lin results on rape differed from that of Raphael and Winter-Ebmer because Lin found that unemployment reduced rape.

### 2.3. Income Disadvantage and Crime

The labour market provides an opportunity to receive an income for individuals who engage in legal work. This income could serve as an incentive to discourage people from committing crimes or, at least, to increase the opportunity costs of crime in society. However, labour market income could be either high or low. High incomes create less of a problem with respect to crime for society when compared to income disadvantages. Rueda and Stegmueller (2016) developed a market model of crime in relationship with income inequality in which a labour market with high inequality ends up creating incentives for a income disadvantage worker to engage in illegal activities. Thereafter, researchers began to focus on the relationship between income distribution and crime. However, rather than focusing on the income gap per se, this study focused on income disadvantage for four main reasons. First, income disadvantage workers have little saving as backup to cope with economic fluctuations. Second, income disadvantage among workers reduces the opportunity costs of crime. Third, few studies have paid attention to income disadvantage and crime and, lastly, limited data on income inequality is available in the country. The discourse on income disadvantage and crime considers a threshold or benchmark for categorizing income as low. The threshold is then examined with those below it to draw conclusions. Such conclusions have not been definitive due to the divergent results across various studies, and income is sometimes not standalone. Suitable and effective public security are required to complement income policy in the labour market (Yildiz, Ocal, & Yildirim, 2013; Anthony, Osho & Sen, 2017, Tung 2019). For instance, Carneiro, Soares, and Ulyssea (2018) specified a structural crime model with consideration given to inequality in Colombia. The study demonstrated how crime was proportionate to the number of various income ranges in the income distribution. The model described the part of the income distribution, which provided more explanation on the disparity of crime occurrence with OLS estimation.

However, Carneiro et al. (2018) concluded that people with an income below the threshold of 80% of population
mean in the seven main cities of Colombia were mostly involved in crime. The translation of this is that a high probability exists for households with a income disadvantage-capita to commit a crime. Similarly, examined the strength of an alternative measure with respect to income inequality. That measure was the ratio of income of the rich-to-poor population. The benefit of this measure is that it captures the lowest income in the quintile and not the gap. A panel data is estimated with GMM using non-overlapping averages of 5-year for 39 nations through 1965–95 for homicide and 37 nations through 1970–94 for robberies. The results showed that countries with higher inequality suffer from more violent crime, which leads to the conclusion that reducing the income ratio would cause a reduction in those crimes. Thus, the means of analysis made it is possible to evaluate a reduction effect of crime when income inequality is reduced and proffers appropriate measures on how to reduce crime in the most countries. This is because a poor income ratio increases homicide and robbery in both the short and long run.

Yildiz et al. (2013) studied three levels of income, which were the lowest income (proxied as minimum wages), middle income and high income. Panel data from 2002 to 2009 was used and panel GMM system estimation was utilized. The results indicated that all the three levels of income were positive and significantly related with crime. The marginal effect suggested that increasing income would reduce crime rate. Thus, the marginal effect suggested that income disadvantage workers engage in more crime compared with workers with high incomes. By implication, then, income disadvantage serves as an incentive to increase crime. Also, the clearance rate was an efficient tool because it was negative and significant with the crime rate. However, the clearance rate is of small value because the study affirmed that this was due to the non-disclosure of crime statistics to the public. Nonetheless, examining the association of various income levels with crime is a remarkable step, providing a clearer understanding of the link between income and crime but poverty was not examined in the model. However, due to unavailability of data in Thailand. This current study is confined to the relationship between income disadvantage and crime.

Unfortunately, studying income disadvantage by previous research without paying attention to the strain cause by income disadvantage to workers misses a key a point in the analysis. Although the economic approach to crime affirmed that income reduces crime, further classifications of income into low and high groups have shown that income disadvantage does serve as incentive to commit crime (Aregbeyen & Fasanyan, 2017; Carneiro et al., 2018). Also, the indefinite findings in Carneiro et al. (2018), Machin and Yildiz et al. (2013) demonstrate that more studies are required to clarify the divergent results. However, previous studies have provided justification for crime deterrence as a support to labour market policy for crime reduction in society.

2.4. Poverty and Crime

The assertion that poverty is positively related to criminal activities has been established by the criminologists (McKeown, 1948). Poverty limits the opportunities for an individual to achieve basic needs and goals. As poverty becomes more pronounced, it weakens social institutions, which, in turn, attracts people to crime and creates further disruptions in society (Hawkins & Weis, 2017). The Becker-Ehrlich economic approach to crime rationalizes this positive relationship as poverty encourages people with poor income to commit crimes (Rueda & Stegmueller, 2016). Subsequently, Hirschi and Gottfredson (2017) noted that the crime rate is higher among the poor due to a high number of arrest among the poor, which is especially true in instances in which where the poor have few or no safety nets. Thus, resource deprivation resulting to poverty encourages the poor to engage in crime if no social protection is provided (Kwon & Cabrera, 2019). Nonetheless, further studies are required to create better strategies for crime-reduction poverty programmes. Strategic crime-reduction poverty programme should be sustainable and move beyond mere strategy (Hirschi & Gottfredson, 2017; Kwon & Cabrera, 2019). Therefore, a study on poverty and crime in Thailand is a necessity to fill the gaps in the literature.

Hirschi and Gottfredson (2017) discussed the results of The Transitional Aid Research Project (TRAP), which was designed to create better prospects for exprisoners and to reduce economic hardships prisoners usually faced after they were released from prison. The Transitional Aid Research Project (TARP), begun in January 1976, in which approximately 4,000 ex-felons (2,000 each in Texas and Georgia) were made eligible for
short-term unemployment benefits to ascertain if limited financial aid would affect recidivism. A structural equation system of 3SLS was used to analyses the data because 3SLS is known to have less specification errors. However, TARP payments, as administered in Georgia and Texas, did not fulfill expectations that they would lower recidivism, but they had a strong negative impact on work-incentive. However, he results also suggest that the payments did work to some degree as intended by subsidizing a more effective job search. Hirschi and Gottfredson (2017) contended that the TARP experiment policy implications lend considerable support to an income-maintenance strategy to reduce arrest recidivism among released prisoners.

Adekoya (2017) studied the long-term impact of unemployment compensation on ex-offenders in California, and evidence suggested that recidivism among ex-offenders could be reduced by providing unemployment compensation available immediately after their release from prison. Using a 5-year follow-up and a failure time model of a program in California conducted during the 1970s and 1980s, they showed how recidivism among those receiving aid was consistently lower over those 5 years than for those not receiving aid. The results in Adekoya (2017) showed that a fairly small unemployment compensation does not increase crime among released prisoners.

The implications of Hirschi and Gottfredson (2017) and Adekoya (2017) is that prolonged unemployment generates a high level of poverty, thereby, causing poverty to increase crime. Moreover, tested employment, basic needs of salary with poverty on crime and the results provided support to Adekoya (2017). That is, reducing income or in cases in which employment is not sustained would increase further deprivation of poverty. Following the harmful effect of 1998-2002 depression in Argentina, tested the efficacy of government means of reducing poverty. The alleviation was done through the unemployed heads of household programme, which involve cash transfers. A panel data set of 23 district in Argentina from 2002 to 2005 was utilized using the Generalized Method Moments (GMM) to provide the statistical relationships. The GMM tool revealed that poverty relief measured reduces total crime, total property crime, robbery, larceny and aggravated assault but was not significant with respect to murder. Thus, poverty (household below the poverty line) increased total crime, robbery while it not significant with respect to property crime, larceny and aggravated assault. Welfare spending has two major roles in Argentina as observed. First, it helps in reducing poverty among the household facing economic deprivation thereby increasing the opportunity cost of crime. Second, strain is reduced due to improvement in household welfare, and, once strain is reduced, crime is lowered. However, the measure of deterrence (real public expenditures per capita) in the study was not significant with any of the crime variables. Consequently, the study suggested that further studies should investigate a better investment option between poverty relief and spending on police to reduce crime.

2.5. Crime and Economic Growth

Adekoya and Razak (2017) demonstrated a link between crime and economic growth based on Becker (1968) theory of rational choice. Prior to Adekoya and Razak (2017), has theoretically linked crime rate with social loss per capita as an improvement on Becker. Other empirical studies like the World Bank (2006) and Dijk (2007) have also lent their support to this assertion. However, this current study differs from Adekoya and Razak (2017), the World on crime and economic growth in terms of time series data employed, and the addition of policy variables that may promote to deterrence to crime. Adekoya and Razak (2017) had considered growth in their work, but their results between crime and economic growth were mixed. Thus, this current study would further provide empirical evidence about the relationship between crime and economic growth. That is, the relationship between crime and economic growth follows Adekoya and Razak (2017).

The roles of crime have been well emphasized in the literature, especially on how it acts as a stoppage on the progress of the economy in terms of growth (Aziz, Manab & Othman, 2016; Ganau & Rodriguez, 2018). A crime committed in the economy incurs more expenditure and causes the mobility of highly skilled labour which is worse than the formal labour market (Adekoya & Razak, 2017). This is because engagement in criminal activities would make the income gains of high human capital workers to be stolen and create fear in them. This fear would not prevent them from participating in the labour market and, by doing so, the anticipated
yield to formal employment would be reduced. Besides, the literature has affirmed that a link between crime and economic growth, but the investigation needs more clarification. Also, the mixed findings in the link between crime and growth make the inference inconclusive. That is, while some available findings have proffered a robust relationship between crime and growth (Enamorado, López-Calva, & Rodríguez-Castelán, 2013; Ganau & Rodríguez, 2018). Adekoya and Razak (2017) found mixed results using two different growth measurements found a contrary result. Thus, this current study presents empirical evidence on the relationship between crime and economic growth. Author noted the high crime rates in the inner city and the trend of workers moving away from the inner city to suburban areas in the southern states of the United States. Moreover, they observed that the suburbs were becoming better places in which to live as personal safety became a source of concern in the inner city, a situation they claim may worsen the growth of income in all the urban regions. This development spurred them to investigate inner-city crime patterns using offence per capita and suburban income growth in the southern states of the United States from 1982 to 1997. The study used both cross-sectional and time series data with 2SLS to resolve the issue of simultaneity. They found that central city violent crime rates and real personal income growth at the county level were inversely correlated (–0.084). Likewise, central city property crime rates and real per capita county income growth rates were inversely correlated (–0.168). Moreover, the robust 2SLS estimation indicated that violent crime in the inner city had a negative effect on nearby suburbs, and the negative effects on suburbs were reduced the further they were from the metropolitan city. In contrast, property crime failed to show the same significant trend as violent crime. Thus, the study provided a weak result, which was not robust significantly, consequently suggested that more studies were required to clearly provide more understanding of how crime impacts growth.

Thus, the approach of Enamorado et al. (2013) to observe the effects of crime at various municipals in Mexico pinpoints a direction in which the government can channel public expenditure to control crime. Also, showing the homicide caused by the drug dealers’ activities proves that the activities of the drug dealers must be curtailed if Mexico is to improve economically. But, the year sample size from 2005 to 2010 used by the study is rather short to provide a detailed conclusion to be drawn on. This limited year sample size was also noted by the study. Similarly, Ganau and Rodriguez (2018) studied the effects of crime on the economic performance of regions in Italy. This was done by using a state space model to evaluate the impact of crime on the Italian economy using a monthly data from January 1979 to September 2002, which was analysed by the OLS estimator. This allowed crime to be specifically examined across time over the various regions in Italy. They found that the effect of crime was greater when a slowdown in economic growth was present because of the need to divert resources required for repositioning the economy so as to control crime. For instance, the study showed that crime reduced economic growth monthly by 0.00041% in the recession period and by 0.00039% in the expansion time. In addition, the long-run exogenous variable of homicide rate reduced the GDP growth as well. This is because in the recession period when crime increased by 1%, the average change in annual GDP growth was -0.00022%. Also, there is a wider distortion of the economy during the recession period than the expansion time at the 5% level of significance, which was due to the high costs of the legal activities imposed by crime.

Thus, Ganau and Rodriguez (2018) study provided more insight on the effects of crime on growth by separating the sample into two different periods of the business cycle. Thus, the performance of the economy, especially in recessionary times, indicates that the economy would need more crime control measures to reduce crime. Nevertheless, the study did not control for other costs of crime like deterrence measures to actually see if the impact would be more (Bruce et al., 2017; Carter et al., 2017). That is, the efforts of public on crime control were not considered in this study to see how they impacted growth along with crime itself. The result in fluctuation in the economy considered with crime in Ganau and Rodriguez (2018) is supported in a similar study related of economic fluctuations by Goulas and Zervoyianni (2015).

2.6. Causality Evidence Socioeconomic Strain, Crime and Economic Growth

Many studies have examined individual social factors with respect to crime and economic growth while testing for Granger causality. Among them, Sghari and Hammami (2016), are related to the socioeconomic strain discussed in this study. Their studies serve as a basis to show that crime study needs to move beyond causation
of crime as endogeneity may exist between variables under investigation. The causality studies considered in this study are presented below. The Granger causality is used to examine the socioeconomic determinants of crime by Sghari and Hammami (2016) in Australia, which was based on time series data from 1963 to 1990. The socioeconomic factors included urbanisation, divorce, police strength, youth male unemployment and dwelling commencements (as a proxy for wealth). Consequently, the Johansen-Juselius cointegration test was used to determine the joint movement of these variables before applying VECM to test for Granger causality. The result showed that the crime of homicide is jointly determined by socioeconomic factors in long-run temporal causality. Besides, the short-run Granger causality showed unidirectional causality from the crime of homicide, robbery, serious assault to youth male unemployment. Also, a unidirectional Granger causality ran from divorce to the crimes of serious assault and fraud and from the crimes of homicide and motor vehicle theft to divorce. While a unidirectional causality ran from dwelling commencements to the crime of fraud and ran from homicide and motor vehicle theft to dwelling commencements. Further, a unidirectional causal relation existed which ran from urbanisation to crime of burglary, and, similarly, from the crime of homicide to police strength. The result shows those types of crime that require concern of the government; for instance, the cause of homicide must be determined to reduce the cost of policing because homicide investigations require more police attention.

In examining the temporal causality in the context of crime dynamism in Turkey, scholar considered socioeconomic factors and crime. The socioeconomic factors were per capita income, unemployment, divorce, urbanisation and public security expenditure. The causality test made use of time series data from 1965 to 2009. The data were subjected to cointegration test in the ARDL model, and consequently the Granger causality was analysed with the VECM. The results showed that socioeconomic factors jointly determined overall crime, non-violent and violent crime in a Granger long run temporal causality. In the short-run, a bidirectional causality existed between per capita income and overall crime, and unidirectional causality existed from per capita income to urbanisation. The causality ran from unemployment to non-violent and per capita income; from per capita income to unemployment, urbanisation and divorce, and from non-violent crime to unemployment and divorce when non-violent crime is considered. That is, a bidirectional causality existed between unemployment and non-violent crimes, and unemployment and per capita income. In violent crime, a short run causality ran from violent crime and per capita income to urbanisation, and from unemployment to per capita income. While the result of the Granger causality showed a unidirectional causality from violent crime to urbanisation in the short run, it runs from urbanization to public security expenditure.

The recommendations of the study were that to reduce crime in Turkey, public cooperation would help make police expenditures more effective is crime reduction. This is based on the community’s awareness and their participation in providing useful information to the police while on patrol. This assertion justifies the causality result with respect to urbanisation and public security expenditure. The result on violent crimes has no links with types of violent crimes in Sghari and Hammami (2016). Similarly, Author considered the Granger causality among social factors and crime in Malaysia. The social factors were fertility rate, GDP growth rate, unemployment and population size, and crime included total crime, property crime and violent crime. Hamzam and Lau used the VECM approach to establish Granger causality based on annual data from 1973 to 2008. In the VECM, the results indicated the existence of long-run temporal causality (Tanaka, 2017). The results showed a unidirectional long-run temporal causality from total crime, property crime and other social factors to population. In the short-run Granger causality on total crime, causality existed from the fertility rate to GDP and total crime; from population to fertility, GDP, unemployment and total crime (Hussain et al., 2018). Also, in property crime, the causality ran from population to GDP, unemployment and property crime. But in violent crime, causality ran from fertility to population and violent crime; unemployment to GDP, and violent crime to GDP.

3. Data Model Estimation and Estimation Technique

The data of 32 years form 1985 to 2017 is gathered form the official sources. The model in this work starts from the work of Becker (1968) on crime and punishment. In determining crime, Becker (1968) specified the supply of crime in society as follows in equation
In equation 1, \( CRI_t \) is the total number of offences which depends on \( PRAR_t \), \( PCO_t \), and \( V_t \). The \( PRAR_t \) shows the probability of arrest and prosecution of criminal, while \( PCO_t \) is the punishment for committing offense and \( V_t \) indicates other variables that influence the act of crime. Moreover, Ehrlich (1973) extended the crime model to include income inequality and other variables in the model as presented in equation 2:

\[
CRI_t = f(PRAR_t, PCO_t, RF_t, RFI_t, PUN_t, W_t, Z_t) \tag{2}
\]

Where, \( RF_t \) is returns from illegal activity as incentive to commit crime, and \( RFI_t \) is the legal existing gap in income, \( PUN_t \) is probability of unemployment, \( W_t \) is the vector of environmental variables while \( Z_t \) capture the psychic effect and other unquantifiable variables on the rate of crime.

Virén (2001) added demographic variables \( (DG_t) \) to the crime model of Becker-Ehrlich as presented in equation 3

\[
CRI_t = f(PRAR_t, PCO_t, RF_t, RFI_t, WT_t, IT_t, SE_t) \tag{3}
\]

\( WT_t, IT_t \) and \( DG_t \) are the working time, income transfers and the possible demographic variables, which include other accounted variables for crime respectively.

In examining how socio macroeconomic variables affect crime in Malaysia, Hamid, Habibullah, and Noor (2013) restructured the crime model based on Virén (2001). The restructuring of the crime model in equation 4 shows that both socio factors and macroeconomic factors were considered in their work. The model is specified as follows in equation 4:

\[
CRI_t = f(V_t, SE_t, ME_t) \tag{4}
\]

In the crime model specified in Hamid et al. (2013), \( SE_t \) are socioeconomic variables that cause strain in the economy, \( ME_t \) are macroeconomic variables that exert undue strain on the people, while \( V_t \) are other variables in the model. This research work employs the crime model in 3.4 with inclusion of family instability and deterrence variable (security expenditure) which are not considered in Hamid et al. (2013). Moreover, Becker (1968) theoretically examined the consequences of crime on society; the consequences were viewed as a cost of crime to society. Thus, Becker came up with the following model to examine the social loss of crime on the society.

\[
CRI_t = f(PRAR_t, PCO_t, COR_t, D_t) \tag{5}
\]

Where, \( COR_t \) cost from crime and \( D_t \) is the damage from crime.

Moreover, this model of social loss function by Becker (1968) was modified by dividing the social loss due to crime into three components. These components are: \( PN_t \) the cost of pain that is associated with economic cost of crime as which is seen as the direct cost of crime in terms of physical and psychological pain borne by the victims; 2) the cost of preventing crime and the cost incurred on judicial system and 3) the implicit cost of sanctions to criminals who were convicted and this represents the forgone earnings due to imprisonment. Thus, Hamid et al. (2013) concluded that the social loss per capita was associated with the crime rate which can be expressed as follows

\[
CRI_t = f(PN_t, PRAR_t, PCO_t, CR_t) \tag{6}
\]

In the two models, Mauro and Carmeci (2007) took into consideration the effect of poor income and income growth as a poverty trap in the society due to crime rates \( (CR_t) \). This is because crime was proven to be detrimental to income due to the taxation that crime imposed on society. That is, an increase in crime return reduces permanently the rate of growth in the economy. The consequence of crime is poor growth which
encourages a poverty trap in society, and this is represented in equation 7 as follows

\[ CRI_t = f(ROA_t, RUNE_t, CR_t) \] ..............................(7)

Thus the econometric model of the current study will be as below

\[ \ln CR_t = \alpha_0 + \alpha_1 RUNE_t + \alpha_2 IDA_t + \alpha_3 ROP_t + \alpha_4 FMI_t + \alpha_5 ANSE_t + \varepsilon_t \] ..............................(8)

In equation 8 \( CR_t \) is the annual crime activities in the country, \( RUNE_t \) is the annual unemployment rate, \( IDA_t \) is the income disadvantage rate, \( ROP_t \) is the poverty rate, \( FMI_t \) is the family instability, \( ANSE_t \) is the annual security expenditure, \( \varepsilon_t \) is the white-noise term.

Where variables are endogenous the ARDL OLS method may provide valid estimates. This is because ARDL OLS uses lagged of the dependent variable as regressors. But it estimates would only be valid provided that the residual is not serially correlated (Pesaran & Shin, 1997). With absence of serial correlation in the residual of ARDL OLS, it can be taken or assumed that there is no endogeneity problem (Pesaran & Shin, 1997). Besides, if endogeneity problem comes up after using ARDL OLS and the variables in the model are indeed endogenous, then the ARDL IV would be used to address this problem of simultaneity (Pesaran & Shin, 1997). Thus explaining equation 8 as follow.

\[ \ln CR_t = \frac{\alpha_0}{\mu(1)} + a_1 RUNE_t + a_2 IDA_t + a_3 ROP_t + a_4 FMI_t + a_5 \ln ANSE_t \]

\[ + \frac{1}{\mu(1)} \sum_{i=1}^{m_1-1} a_1 \Delta RUNE_{t-i} + \frac{1}{\mu(1)} \sum_{i=1}^{m_2-1} a_2 \Delta IDA_{t-i} + \frac{1}{\mu(1)} \sum_{i=1}^{m_3-1} a_3 \Delta ROP_{t-i} \]

\[ + \frac{1}{\mu(1)} \sum_{i=1}^{m_4-1} a_4 \Delta FMI_{t-i} + \frac{1}{\mu(1)} \sum_{i=1}^{m_5-1} a_5 \Delta \ln ANSE_{t-i} + \varepsilon_t \] ..............................(9)

The ARDL IV combined the short-run and the long-run in the same model. When it is used to model variables, the problem of simultaneity bias is avoided, and a further test for exogeneity is not required. That is, making relevant adjustment to ARDL orders, ARDL model is adequate to simultaneously correct for the serial correlation in the residual and further problems in endogenous regressors (Pesaran & Shin, 1997). This process allows endogenous variables to be estimated with ARDL IV. The ARDL OLS is transformed to Bewley’s equation of 1979 and thus, estimated with Instrumental Variables method by using 2SLS (Pesaran & Shin, 1997).

4. Results and Discussions

The results of the correlation test between dependent variable and independent variables proved to be very useful in pre estimation analysis especially as regards potential relationships suggested by theories. Therefore prior to the econometrics analysis, the statistical correlation of the variables are examined which helped in determining the statistical relationships between and amongst the variables.
Table 1. Correlation Analysis

<table>
<thead>
<tr>
<th></th>
<th>CO2</th>
<th>FD+</th>
<th>FD-</th>
<th>GDPG</th>
<th>EC</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RUNE</td>
<td>0.15</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.41)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IDA</td>
<td>0.20</td>
<td>0.13</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.27)</td>
<td>(0.48)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROP</td>
<td>0.26</td>
<td>-0.13</td>
<td>0.41</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.15)</td>
<td>(0.46)</td>
<td>(0.02)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FPI</td>
<td>0.03</td>
<td>-0.12</td>
<td>0.43</td>
<td>0.03</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>(0.87)</td>
<td>(0.52)</td>
<td>(0.01)</td>
<td>(0.88)</td>
<td></td>
</tr>
<tr>
<td>ANSE</td>
<td>0.53</td>
<td>0.42</td>
<td>0.51</td>
<td>0.29</td>
<td>0.72</td>
</tr>
<tr>
<td></td>
<td>(0.71)</td>
<td>(0.59)</td>
<td>(0.21)</td>
<td>(0.48)</td>
<td>(0.38)</td>
</tr>
</tbody>
</table>

ASEAN’s optimum models selection was undertaken as depicted by Table 2 and the table 3. The selected models are ARDL \((2,1,0,0,1)\), ARDL \((1,1,0,2,1,0,2,0,0,0)\).

Table 2. ARDL long term OLS estimation.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficients</th>
<th>Standard Error</th>
<th>t-statistics</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARDL ((1,1,0,0,1))</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RUNE</td>
<td>0.415</td>
<td>0.142</td>
<td>1.522</td>
<td>0.008</td>
</tr>
<tr>
<td>RUNE (-1)</td>
<td>0.455</td>
<td>0.147</td>
<td>3.090</td>
<td>0.006***</td>
</tr>
<tr>
<td>IDA</td>
<td>0.010</td>
<td>0.019</td>
<td>1.427</td>
<td>0.024</td>
</tr>
<tr>
<td>IDA (-1)</td>
<td>0.000</td>
<td>0.201</td>
<td>5.938</td>
<td>0.000***</td>
</tr>
<tr>
<td>ROP</td>
<td>-0.477</td>
<td>-0.137</td>
<td>-3.498</td>
<td>0.002*</td>
</tr>
<tr>
<td>FMI</td>
<td>0.001</td>
<td>0.001</td>
<td>4.202</td>
<td>0.243***</td>
</tr>
<tr>
<td>lnANSE</td>
<td>-0.023</td>
<td>-0.043</td>
<td>0.526</td>
<td>0.604</td>
</tr>
<tr>
<td>lnANSE (-1)</td>
<td>-0.065</td>
<td>-0.037</td>
<td>3.763</td>
<td>0.092**</td>
</tr>
<tr>
<td>C</td>
<td>7.406</td>
<td>2.882</td>
<td>2.570</td>
<td>0.018*</td>
</tr>
<tr>
<td>T</td>
<td>0.045</td>
<td>0.009</td>
<td>4.731</td>
<td>0.000*</td>
</tr>
</tbody>
</table>

Table 2. ARDL IV Long-run Estimates

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficients</th>
<th>Standard Error</th>
<th>t-statistics</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARDL ((1,1,0,2,1,0,2,0,0,0))</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RUNE</td>
<td>0.425</td>
<td>0.183</td>
<td>2.327</td>
<td>0.031*</td>
</tr>
<tr>
<td>RUNE(-1)</td>
<td>0.340</td>
<td>0.173</td>
<td>1.959</td>
<td>0.065</td>
</tr>
<tr>
<td>IDA</td>
<td>0.000</td>
<td>0.000</td>
<td>1.401</td>
<td>0.177</td>
</tr>
<tr>
<td>IDA (-1)</td>
<td>0.000</td>
<td>0.000</td>
<td>4.338</td>
<td>0.000*</td>
</tr>
<tr>
<td>ROP</td>
<td>-0.428</td>
<td>0.195</td>
<td>2.201</td>
<td>0.040*</td>
</tr>
<tr>
<td>FMI</td>
<td>0.045</td>
<td>0.056</td>
<td>0.795</td>
<td>0.437</td>
</tr>
<tr>
<td>FMI (-1)</td>
<td>0.033</td>
<td>0.057</td>
<td>0.570</td>
<td>0.575</td>
</tr>
<tr>
<td>FMI (-2)</td>
<td>0.103</td>
<td>0.062</td>
<td>1.675</td>
<td>0.110</td>
</tr>
<tr>
<td>lnANSE</td>
<td>0.033</td>
<td>0.048</td>
<td>0.689</td>
<td>0.499</td>
</tr>
<tr>
<td>lnANSE (-1)</td>
<td>0.097</td>
<td>0.053</td>
<td>1.831</td>
<td>0.083**</td>
</tr>
<tr>
<td>ΔRUNE</td>
<td>0.429</td>
<td>0.118</td>
<td>3.624</td>
<td>0.001*</td>
</tr>
</tbody>
</table>
The main difference is that family instability is significant in the property crime model. Property crime are armed robbery which include also robbery and extortion, burglary and false pretense/cheating crimes. Unemployment increases property crime at the 5% level of significance. Increasing unemployment by 1% would increase property crime by 0.05%. This means improving labor policy would cause a crime reduction in property crime. A similar result is presented in Blasio et al. (2016). Also, income disadvantage encourages the poor to engage in property crime at the 10% level of significance. An increase in income disadvantage by 1% would increase property crime by 1.066%. This means an increase in the number of people with disadvantaged incomes would cause crime to increase. Perhaps, increasing income disadvantage even further would intensify more strain on the income disadvantage earners and this would eventually lead them to engage in property crime (Tarling & Dennis, 2016). To add, financial gain serve as incentive to the criminals to commit property theft as stolen property could be resold to the market for income gain (Sidebottom, Ashby, & Johnson, 2014). Poverty is not significant in this model. The deterrence variable showed an adverse effect on property crime at the 1% level of significance. With an increase in security expenditure by 1% property crime would be reduced by 0.209%. The result supported the overall crime rate but differed from the person’s crime rate because it was not significant in the person’s crime model. A similar result was found in Coccia (2017) as police expenditures have a stronger effect on property crime than on violent crime. Family instability showed a positive relationship with property crime at the 1% level of significance. This means any increase in family instability results in a property crime increase. Thus, the failure to improve conditions that stimulate family instability would encourage children from families experiencing instability to engage in crime. These conditions includes emotional disturbance in children due to family structure, family breakup and the poverty rate (Coccia, 2017). Results presented here support Coccia (2017) on property crime, but Kelly’s work is more robust because family instability was found to be positively related with violent and property crime. With the measure of divorce rate for family instability, Halicioglu, Kiki, and Yavuz (2012) found a positive relationship between family instability and property crime, including robbery and larceny.

5. Conclusion

Socioeconomic strains have similar dimensions of impacts on crime variables regarding the positive relationship based on the above results. Deterrence variables performed as expected on other crime variables except on person’s crime. Family instability showed a positive impact on property crime. The extent that socioeconomic strain affects crime variables has shown that the strain of frustration, anger and stress in people are exhibited in the social and economic factors that prevail in Thailand. Individuals facing economic hardships brought by socioeconomic factors would innovate alternative means to survive. These alternatives are described as being illegal in Becker (1968). Other means are to engage in property crime and person’s crime including assassination/murder, rape, kidnapping, felonious wounding, burglary, armed robbery and false pretense to complement their earnings. The results showed that unemployment affects the person’s crime rate and property crime rate positively at various significance levels both in the long run and the short run. This may be not a surprise because high unemployment exists in Thailand. The high unemployment rate includes graduates and non-graduates who are produced from educational institutions looking for jobs but are unable to find ones. Those who found jobs might not be fully engaged with the nature of the work that they are doing if those jobs do not take into consideration their qualifications. These young graduates and non-graduates should be able to contribute meaningfully to the country.
References


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TOWARDS SUSTAINABLE DEVELOPMENT: THE ROLE OF R&D SPILLOVERS IN INNOVATION DEVELOPMENT

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Abstract. One of the most essential strategic resources of the company is the knowledge that is used and developed within the company, creating innovations, and can be transferred among other companies, organizations, industrial sectors, and countries. The key reason for this spillover is the vulnerability of knowledge transfer channels. Knowledge is quickly transmitted through the media, scientific publications, reverse engineering, R&D cooperation, interaction between staff of various firms, companies, and organizations. In addition, knowledge cannot fully belong to the organization. R&D spillovers have a positive impact on innovation development; promote access to knowledge and its dissemination on a non-profit basis which enhances R&D cooperation between different economic entities, organizations, countries in the field of innovation diffusion. The contribution of R&D spillovers to achieving innovation development, the relationship between knowledge spillovers, innovation and R&D cooperation have been thoroughly examined. Differences between knowledge spillovers, knowledge transfers, and knowledge externalities have been identified. Types of R&D spillovers and levels of knowledge spillovers have been considered. Mechanism and theories of knowledge spillovers and local competition have been analysed. Comparative, systematic and critical analysis of scientific literature has been used in order to create the theoretical background for research of R&D spillovers and their impact on innovation development and economic growth.

Keywords: innovation; spillovers; R&D spillovers; types of R&D spillovers; knowledge spillovers


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JEL Classifications: O31, R11

1. Introduction

Sustainable development is dependent on innovation performance. Knowledge and innovation have a vital role in ensuring the competitiveness of the company. The development of the knowledge economy shifts the focus to the use of technological innovations to create and disseminate new knowledge through the development of innovative products and processes. The creation of innovation does not occur in isolation, in particular due to complexity, high risks and costs, and therefore the importance of R&D is increasing (Montoro-Sánchez, A. et al., 2011, Petrenko, Y. et al., 2019, Girdzijauskaite, E. et al., 2019; Šimonová, J. et al., 2019; Hrivnak, M. et al., 2019; Bezpalov, V.V. et al, 2019).

One of the most essential strategic resources of the company is the knowledge that is used and developed within the company, creating innovations, and can be distributed among other companies. The vulnerability of knowledge exchange channels lies at the bottom of this distribution. Knowledge can be quickly transferred through the media, scientific publications, reverse engineering, scientific cooperation, interaction between staff
members of various companies and organizations, patent disclosures, scientific exchange programs and scientific collaboration, etc. In addition, knowledge cannot belong entirely to the company, organization or individual producing them due to its imperfect appropriability (Griliches, Z., 1979; Cohen, W., Levinthal, D., 1989; Krchová, H., 2019; Lysytsia, N. et al., 2019; Batkovskiy, A.M. et al., 2019; Hasan, M., 2019).

Knowledge obtained by the company in the course of R&D may “spill over” to another company and bring it an economic benefit resulting from their use, R&D spillover effects (Jaffe, A.B., 1986). Spillovers occur if an innovation implemented by one entity increases the performance of another entity without the latter benefiting entity having to pay (full) compensation (Van Stel, A.J., Nieuwenhuijsen, H.R., 2004, p. 4). Companies can often acquire external knowledge, which was transferred through different channels, without having to pay for it (Verspagen, 1997). Rehme, J., Staffan, S. (2017, p. 9) define spillovers as “thus “externalities” to large high-tech development projects, i.e. that is not included in the original contract”. Levin, R.C., Reiss, P.C. (1988) and De Bondt, R. (1996) describe spillover as the side effects of company’s R&D investment strategies.

The R&D spillover has its origin in 1890, where Alfred Marshall noted that “the secrecy of business is on the whole diminishing, and the most important improvements in method seldom remain secret for long after they have passed from the experimental stage” (Marshall, A., 1920). Alfred Marshall’s theory was later extended by Kenneth Arrow (Arrow, K., 1962) and Paul Romer (Romer, P., 1986) and abbreviated as MAR (Marshall-Arrow-Romer).

The objective of this research paper is to determine the key characteristics of R&D spillovers and create the theoretical background for measuring the impact of R&D spillover on innovation development. The structure of the paper is arranged as follows: the review of relevant literature associated with the research topic is summarized in Section 2, the methodology is elaborated in Section 3, and the results of the research are provided in Section 4. Discussion and conclusions are presented at the end of the paper.

2. Literature Review


3. Methods

In the following paper, systematic and comparative analyses of academic literature have been used to examine the concept of R&D spillovers and innovation, definitions of knowledge spillovers, the evolution of knowledge spillovers theories, and the research covering the relationship between elements of knowledge spillovers mechanism. Comparative, systematic and critical analyses have been applied to identify and classify the types of R&D spillovers (knowledge, market, and network spillovers) and types of knowledge spillovers. The inductive method has been employed to substantiate the levels of knowledge spillovers i.e. individual, enterprise and global levels. By using the deductive method, the difference between knowledge transfers, knowledge spillovers and knowledge externalities was identified, and an integrated model was formed based thereon. Synthesis and interpretation were used to draw conclusions of the paper.

4. Results

Definitions of Knowledge Spillovers

Knowledge spillovers promote access to knowledge and its dissemination on a non-profit basis, while enhancing cooperation between different business entities, organizations, industrial sectors, and countries in the field of innovation diffusion. Knowledge spillovers have a positive effect on innovation development (Verspagen, B., De Loo, I., 1999). E.g. while company A creates innovation, other companies may use the knowledge developed by company A as a part of the said innovation in their own activities. Aside from the aforementioned, knowledge spillovers enhance inter-organizational collaboration in spreading and gaining access to knowledge, and thus have a positive impact on cooperation agreements (Simonen, J., McCann, P., 2008). Knowledge spillovers occur due to failures in the legal protection mechanisms (patents, copyright, trademarks, trade secrets, etc.) of knowledge generating companies (Fallah, M.H., Sherwat, I., 2004). The key definitions of knowledge spillovers are given in the table below (see Table 1).

<table>
<thead>
<tr>
<th>Authors</th>
<th>Definitions</th>
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<tbody>
<tr>
<td>Griliches, Z. (1979); Bayar, A. et al. (2007), p. 14</td>
<td>“Knowledge spillovers that arise because of the imperfect appropriability of knowledge: poor patent protection, reverse engineering,... are pervasive phenomena that contribute to the diffusion of knowledge.”</td>
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<tr>
<td>Grossman, G., Helpman, E. (1991), p. 16</td>
<td>“The partial nonexcludability of knowledge suggests that industrial R&amp;D may generate “technological spillovers”. By technological spillovers we mean that (1) firms can acquire information created by others without paying for that information in market transaction, and (2) the creators or (current owners) have no effective recourse, under prevailing laws, if other firms utilize information so acquired.”</td>
</tr>
<tr>
<td>Jaffe, A.B., 1998, p. 11</td>
<td>“Knowledge created by one agent can be used by another without compensation, or with compensation less than the value of the knowledge. Knowledge spillovers are particularly likely to result from basic research, but they are also produced by applied research and technology development.”</td>
</tr>
<tr>
<td>Breschi, S., Lissoni, F. (2000), p. 1</td>
<td>“Localized knowledge spillovers” (LKS), can be defined as “knowledge externalities bounded in space”, which allow companies operating nearby the knowledge sources to introduce innovations at a faster rate than rival firms located elsewhere.”</td>
</tr>
<tr>
<td>Fallah, M.H., Sherwat, I. (2004), p. 8</td>
<td>“Spillovers are the unintentional transmission of knowledge to others beyond the intended boundary.”</td>
</tr>
<tr>
<td>Keller, W. (2004), p. 753</td>
<td>“The partially private, partially public nature of the return to technological investments implies that while there is a force that might be strong enough to sustain the private incentive to innovate (the private return, which is often a temporary monopoly), technological investments may also create benefits to firms and individuals external to the inventor by adding to their knowledge base (the public return). These benefits are usually called knowledge spillovers. An example is that the design of a new product might speed up the invention of a competing product, because the second inventor can learn from the first by carefully studying the product, or even the production design”.</td>
</tr>
<tr>
<td>Kafouros, M.I., Buckley, P.J. (2008)</td>
<td>Knowledge spillovers occur when a firm exploits knowledge and ideas developed by other firms.</td>
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</table>
“Knowledge spillover occurs when recipient firms combine the knowledge of an originating firm with other knowledge. When recipient firms combine the originating firm’s knowledge with knowledge that is unfamiliar to the originating firm, the recipient firms potentially provide insight to the originating firm on the viability of exploring such knowledge.”

Knowledge spillovers, can be defined also as the external benefits from “the creation of knowledge that accrue to parties other than the creator, occur at multiple levels of analysis, be it within or across organizations and networks.”

Knowledge spillovers are “unintentional flows of knowledge from one network party to another.”

“Knowledge spillover-based strategic entrepreneurship as unintentional knowledge flows that can be used for strategic purposes to network entities other than the creators for innovative, risk taking, proactive and competitive business reasons.”

There is a connection between knowledge externalities, knowledge transfers, and knowledge spillovers (see Figure 1). The term “externality” was introduced by Alfred Marshall (Marshall, A., 1890) and developed by Arthur C. Pigou (Pigou, A. C., 1920) in his book “The Economics of Welfare” in 1920 (Tsyplakova, D., 2010). The externality can be defined as costs incurred or benefits received by a third party which is not directly involved in the creation of the said cost or benefit. R&D is an example of positive externalities. Knowledge transfers and knowledge spillovers are the sources of externalities; and externalities are indicative of a positive effect of knowledge transfers and knowledge spillovers on innovation development. If the knowledge is transmitted intentionally, it is known as knowledge transfer (publications, presentations, formal training etc.). Due to the knowledge exchange, knowledge transfer involves cross-party collaboration and compensation. The external benefits of the knowledge creation through knowledge spillovers are accrued to the network parties other than the innovator (Ko, W.W., Liu, G., 2015). “Knowledge spillovers are the unintentional transmission of knowledge to others beyond the intended boundary” (Fallah, M.H., Sherwat, I., 2004, p. 8). There are various knowledge exchange channels, through which information can be transferred from one agent to another (see Figure 1).
Due to the knowledge flows, knowledge is created, captured, retained, and applied. Every possible interaction creates potential for knowledge spillovers and spillover flows, can enhance innovation activity and result in innovation diffusion. Spillover flows consist of tacit and explicit knowledge that arises within the entities (companies, firms, and institutions) and through market transactions or knowledge exchanges between people, companies, institutions, industries, and even across nations. Hence, sharing knowledge outside the intended entity (agent, economic unit) and unintended use of knowledge can result in different types of spillovers and cause knowledge externalities.

**Types of R&D Spillovers**

Three distinct types of R&D spillovers have been identified in the academic literature. These are namely knowledge spillovers, market spillovers, and network spillovers (Jaffe, A.B., 1998; Jones, C.I., Williams C.W., 1998; Medhurst, J. et al., 2014):

1. Knowledge spillovers mean the use of knowledge from the agents without full compensation in order to generate economic, social or environmental benefits. Creation, transfer, absorption of knowledge, and its commercialisation lead to dissemination of knowledge and increase in the scale of spillovers (e.g. through knowledge sharing, employee mobility, the use of published scientific papers etc.).

2. Market spillovers occur if market participants receive some of the benefits that arose through the operation of the market for a new product other than the innovating companies. The key difference between market spillovers and knowledge spillovers is this “leakage” of benefits through the activities of market forces, rather than the flow of knowledge itself. Whenever a company creates a new product, improves the existing one or reduces the existing product’s manufacturing cost, the natural operation of market forces will tend to cause some of the benefits thereby created to be “spilled over” to consumers. As a result, buyers will be made better off by the introduction of the new or improved product. Implementation of innovation often results in both higher quality and lower prices, and thereby customers have social benefit that is not captured by the innovator (Jaffe, A.B., 1998).

3. Network spillovers occur when the value of a new technology is highly dependent on the development of a set of related technologies. Adam B. Jaffe (1998, p. 12) notes that “the different related research projects are like the different users of a network”, thereby the term “network spillover” has been chosen. “The value of a network to any one participant is an increasing function of the number of participants; here the expected value of any one research project is an increasing function of the number of different projects undertaken” (Jaffe, A.B., 1998, p. 12). The examples of network spillovers have been considered by James Medhurst, Joel Marsden, Angina Jugnauth, Mark Peacock, Jonathan Lonsdale (Medhurst, J. et al., 2014) as a result of the technology support programme. They defined network spillovers as “the effect of programme innovation on the development of a “critical mass” of users, where the take-up of the innovation by additional users, increases the value of the innovation to existing users (for example, computer games)” (Medhurst, J. et al., 2014, p. 8). Network spillovers exist even if there are no knowledge spillovers among the companies, although knowledge spillovers are also likely to arise (Jaffe, A.B., 1998).

**Levels and Types of Knowledge Spillovers**

Tacit and explicit knowledge can be exchanged at different levels, in different forms, and the reason for such exchange may vary as well. Knowledge flows take place among individuals or through knowledge transmission via the human capital acquisition, across companies, or between companies and organizations, as well as between countries (see Figure 2).
Most literature sources emphasize three levels of knowledge spillovers:

1. Individual level (among people). Knowledge can be unintentionally exchanged between members of a team working together, whether from within the same companies, organizations or from different entities. Face-to-face interactions and social contacts are important for knowledge diffusion (Van Stel, A.J., Nieuwenhuijsen, H.R., 2004). Knowledge spillovers can arise through information shared outside the group of people, outside company or organization (knowledge exchange across customers, inventors, scientists, and researchers who are not intended to possess such knowledge).

2. Enterprise level (among companies, and firms). Any unintended exchange of information between companies is known as knowledge spillover. For instance, it can arise when the private companies are getting involved in B2B relationships. Knowledge spillovers can happen:
   – between companies located in close proximity (between neighboring companies) as a result of industry specialization (Marshall, A., 1890; Arrow, K., 1962; Romer, P., 1986), if companies operate in industries that are geographically concentrated (Jaffe, A.B., 1986).
   – if companies are doing business together as a result of the diversity and variety of knowledge between complementary industries or customers and suppliers that service each other (Fallah, M.H., Sherwat, I., 2004); a knowledge spillover effect is observed when one company adopts an innovation or an improvement that has worked for another.

1. Global level (between countries). This is a case of unintentional knowledge flows between neighbouring countries as illustrated by the study of the United States spillover to Canadian manufacturing companies (Bernstein, J., 2000), or it can accompany the process of knowledge transfer that happens when countries have international collaboration as in the study of spillover effects from industrial partnership between Sweden and Brazil (Rehme, J., Staffan, S., 2017).

The type of knowledge has an impact on the manner in which spillover flows will extent from one agent to another. It should be noted that tacit knowledge can be exchanged only at the individual level, while explicit knowledge can be exchanged by face-to-face contact at the individual, enterprise or even at the global level (Fallah, M.H., Sherwat, I., 2004).

The majority of academic literature identifies the following types of knowledge spillovers:

1. Based on the level of diffusion:
   – knowledge spillovers at the micro-level (individual level and enterprise level);
   – knowledge spillovers at the macro-level (global level);
2. Based on the object of diffusion:
   – rent-spillovers are related to the flow of goods between companies (Griliches, 1992; Montoro-Sa´nchez, A. et al., 2011). If goods are used as inputs in the productive process of another company, the latter company will receive some product innovation as a spillover from that input (Verspagen, 1997);
   – pure knowledge spillovers refer to the effect of research performed by economic agent i (a company, an industry or a country) to improve technology in a second economic agent j without j having to pay for it (Griliches, 1992). Pure knowledge spillovers usually enhance the performance of a company’s own R&D (Verspagen, 1997).

3. Based on the direction of diffusion:
   – intra-industry or vertical knowledge spillovers occur if the company that is the knowledge recipient operates in a different field from the sender (Kaiser, 2002); happen as a result of industry specialization (Marshall, 1920; Arrow, 1962; Romer 1986);
   – inter-industry or horizontal knowledge spillovers arise when the recipient and sender companies conduct activity in the same field of business (Kaiser, 2002); happen as a result of the diversity of knowledge between complementary industries or customers and suppliers that service each other.

**Mechanism of Knowledge Spillovers**

There are a number of ways that knowledge can be “spilled over” to other agents:

1. Collaborations between companies and universities. Technology development leads to knowledge spillovers by direct project participation from different companies, and indirect involvement in various business and scientific projects, and through publications.

2. Knowledge can be transferred through joint R&T and R&D projects in the specific development of the project (classical).

3. The human capital acquisition. Employees leaving the company, along with the skills and knowledge they have acquired working in the company, can either establish their own business or are employed by other companies (Rehme, J., Staffan, S., 2017).

As David B. Audretsch (1998, p. 23) puts it: “The theory of knowledge spillovers, derived from the knowledge production function, suggests that the propensity for innovative activity to cluster spatially will be the greatest in industries where tacit knowledge plays an important role. (...) it is tacit knowledge, as opposed to information, which can only be transmitted informally, and typically demands direct and repeated contacts.”

There are three main theories on knowledge spillovers and local competition (Van Stel, A.J., Nieuwenhuijjsen, H.R., 2004). These theories explain the exact mechanisms of knowledge spillovers and focus on two questions (Van Stel, A., 2006):

1. Do knowledge spillovers primarily arise within one sector or, alternatively, do spillovers occur between different sectors?

2. What impact does local competition have on innovative activity and economic growth? The first theory introduced by Marshall, A. (1890) was developed by Arrow, K. (1962), and Romer, P. (1986), and abbreviated as MAR. The key point of MAR theory can be summarized as follows:
   – knowledge spillovers are most effective between homogeneous companies and primarily arise within one sector, industry specialization enhances knowledge spillovers and stimulate economic growth, for example, microchip manufacturing industry in Silicon Valley (Glaeser E.L. et al., 1992, p. 1130);
   – a local monopoly is beneficial for innovation development and economic growth; regional sectoral growth is maximized if the industry sector is dominant in the region, and if a local competition is not too strong (Van
Stel, A.J., Nieuwenhuijsen, H.R. 2004);
– knowledge accumulated by one company tends to contribute to the development of technologically close
companies (Jaffe, A.B., 1986) and produces an additional incentive for innovation development;

Therefore, according to MAR theory, the geographic concentration of the production allows companies to
benefit from the knowledge spillovers within the industry sector, which, in turn, drives economic growth for
industries in specialized sectors that are geographically concentrated.

The second theory was developed by Porter, M.E. (1990). This theory agrees with the MAR’s statement that
knowledge spillovers among companies doing business in industrial sectors, which are concentrated in cer-
tain region, enhance economic growth. In contrast to MAR theory, which emphasizes the negative effect of
competition on innovation development, Porter’s theory states that local competition has a positive effect on
economic growth through acceleration of imitation and enhancing innovation activity. If a company does not
implement innovations, it will lose its competitive position. Therefore, in competitive environment companies
are “forced” to be innovative (Van Stel, A.J., Nieuwenhuijsen, H.R. 2004). Italian ceramics and gold jewellery
industries are an example that proves Porter’s theory (Glaeser E.L. et al., 1992, p. 1128).

The third theory was developed by Jacobs, J. (1969) and emphasizes the importance of local knowledge spill-
overs, which work out most effectively between companies conducting different activities. In this case, there
are intra-industry or vertical knowledge spillovers. Jacobs’ theory (1969) and Porter’s theory (1990) have the
same statement, that local competition increases the implementation of technological innovation and, conse-

Conclusions

This paper examines R&D spillovers and their impact on innovation. R&D spillovers enhance innovation
development via knowledge diffusion between different agents. There are various types of R&D spillovers:
knowledge, market, and network spillovers. The new growth theory primarily focuses on knowledge spillovers.
The term “knowledge spillovers” means unintentional transmission of information and knowledge through
various channels of knowledge exchange from one economic unit to another without full compensation for the
economic unit, which had created such knowledge. Information can be transferred across borders at practically
zero cost, and knowledge spillovers occur due to imperfect appropriability of knowledge implemented in in-
novation.

There is a connection between knowledge transfers, knowledge spillovers and knowledge externalities. The
key difference between knowledge transfer and knowledge spillovers is knowledge holders’ intention. Knowl-
edge externalities result from the effects of the knowledge transfers and knowledge spillovers. In most cases,
knowledge externalities are positive.

The object of knowledge spillovers is information and knowledge. Tacit knowledge “spills over” at the indi-
vidual level, while explicit knowledge can be exchanged at the individual, enterprise and global levels. There-
fore, subjects of knowledge spillovers include people, companies (enterprises, firms), organizations, industrial
sectors, and countries.

Analysis of academic literature allowed arranging the types of knowledge spillovers into groups based on three
criteria: level of diffusion, object of diffusion, and direction of diffusion. Theories of knowledge spillovers ex-
plain how knowledge spillovers impact innovation development and promote economic growth depending on
geographic concentration of the production and local competition.
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CLUSTER FUNCTIONING AS A DIRECTION OF SUSTAINABLE TERRITORIAL - INDUSTRIAL PARTNERSHIP

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Abstract. The development of clusters contributes to the growth of agriculture and processing industry of the republic. The use of the cluster approach corresponds to the nature of agricultural products, which needs processing and timely marketing and delivery to consumers. One of the goals of cluster formation in food production and business development in interrelated industries, along with increasing the competitiveness of national agribusiness products, should be to ensure the safety of final products for consumer health. Agriculture should ensure the safety of the raw materials supplied, food engineering - the safety of equipment on which food products will be manufactured, packaging production - the safety of packaging in contact with foodstuffs.

Keywords: cluster; development; industry; equipment; raw materials; structure; agri-food sphere, partnership; innovations


JEL Classifications: Q16

1. Introduction

One of the promising directions in solving the strategic tasks of sustainable development of Kazakhstan and in the agri-food sector is the creation of integrated structures based on a cluster approach that facilitates import substitution and export orientation of the agricultural sector. This approach assumes the maximum use of the existing productive potential of industries related to food production, modernization and rational distribution of agricultural enterprises, as well as their effective financing (Altukhov, 2019; Moumen et al., 2019). A cluster is a sustainable territorial and sectoral partnership, united by an innovative program to introduce advanced production, engineering and management technologies in order to increase the competitiveness of its participants.

2. Review of literature and methods of research

World experience shows that the territorial integration of technologically and economically interconnected structures can improve the logistics of their products and get an additional effect due to the possibility of combining the regional corporate strategy and the competitive advantages of organizations located within its borders. There is a lot of attention to role of clusters and their functioning peculiarities in the contemporary scientific literature (Tireuov et al., 2018; Žižka et al, 2018; Razminiè, Tvaronavièienè, 2018; Havierièková, Kordoš, 2019; Petrenko et al., 2019; Amraoui et al., 2019; Bublièè et al., 2019). We agree, the cluster approach is the basis for the optimal solution of many social, environmental and regional problems in the field of food production (Adamczyk et al., 2019).
The cluster approach can be successfully applied for the development of agriculture and the processing industry of the Republic. Using the cluster approach corresponds to the nature of agricultural production, which requires quick processing and timely delivery to the consumer. One of the goals of cluster formation in food production and the development of joint business in related industries, along with increasing the competitiveness of agricultural products, should be to ensure the safety of final products for consumer health (Adamczyk et al., 2019; Mahrinasari, 2019). This means that agriculture must ensure the safety of the raw materials supplied, food engineering - the safety of equipment on which food products will be manufactured, and packaging production - the safety of packaging in contact with food (Alinkulova, 2018; Bezpalov et al., 2019).

3. The discussion of the results

World experience shows that the territorial integration of technologically and economically interconnected structures allows to improve the logistics of their production and to obtain additional effect due to the possibility of combining the corporate strategy of the region and the competitive advantages of organizations located within its borders. In addition, the cluster approach is the basis for optimal solutions of many social, environmental and regional problems in the field of food production.

The cluster approach can be successfully applied for the development of agriculture and processing industry of the Republic. Using the cluster approach corresponds to the nature of agricultural production, which requires quick processing and timely delivery to the consumer. One of the goals of cluster formation in food production and joint business development of interrelated industries, along with increasing competitiveness of agricultural products, should be to ensure safety of end products for consumer health. This means that agriculture must ensure the security of supply of raw materials, food engineering - equipment safety, which will be manufactured by the food and packing industry - safety of packaging in contact with food.

In the last decade, clusters are the most successful tool of economic development of regions in Western countries. The cluster concept represents a new way of doing national economy, and also points to new roles of companies, governments and other organizations. The experience of many countries and regions of the world shows that clusters contribute to the productivity and prosperity where they are used.

The study of domestic and foreign economic theory and management practice proves that in the present time, the clusters are the basic element in the development of the leading national economies. Almost completely the clustering of affected industry Denmark, Finland, Sweden, Norway. Resource, technological, innovative, managerial and competitive advantages of clusters used in the most important sectors of the economy, including food production, biopharmaceutical funds from agricultural raw materials in the countries of South-East Asia, China, Singapore, and Japan. According to experts, to date, clustering covers about 50% of the economies of leading countries, including USA, Italy, UK, France, Germany and others (Bohdaniuk et al., 2019).

In contemporary world, one of the main directions of increase of efficiency of activity of industrial enterprises – formation of agro-industrial clusters is explained by their advantages in comparison with traditional ways of interaction: reducing costs of commodity circulation, the elimination of duplicate functions and the total synergy effect for each participant at the expense of a broader and more comprehensive integration.

Cluster or industrial group is a group of geographically neighbouring interconnected companies and related organizations operating in a certain area and characterized by common activities and complementary to each other. Clusters take various forms depending on their depth and complexity, but in most cases, include the company’s finished product or service companies; suppliers of specialized inputs, components, machinery, and services; firms in related industries (Mizanbekova, Bogomolova, 2016).

Clusters often occur naturally. An example is the cluster for processing of agricultural production: farms, processing plants, storage premises operate in a complex and perform their work with certain standards. Cluster
development is the main direction in improving Kazakhstan’s competitiveness on the world market. Guarantee that is its successful application in developed countries like USA, Japan, Germany, Italy. Cluster development in Kazakhstan will bring not only direct economic benefits but also will allow to communicate more effectively the private and public sectors of the economy. The existing system of sectoral approach focuses on horizontal relations, while the cluster approach focuses on the importance of vertical relations between enterprises of different spheres and the interdependent symbiotic relationship, based on synergy. In addition, the cluster perspective changes the role of government and the nature of state intervention.

As a result of interaction of entire groups of industries within clusters contributes to the employment growth, investment, and accelerated the dissemination of advanced technologies in national economy. The countries of the European Union adopted the Scottish model of the cluster in which the core of such a joint production became a major enterprise, which brings together small firms. And there is the Italian model - more flexible and “equitable” cooperation of the enterprises of small, medium and large businesses. The experience of these countries showed that the cluster approach provides a basis for constructive dialogue between representatives of the business sector and the state. It is possible to increase the efficiency of interaction of the private sector, state, trade associations, research and educational institutions in the innovation process.

In the post-socialist countries is more widespread cluster principles of the organization of industrial cooperation at the regional level. This approach provides a great opportunity how to improve the competitiveness of local business and to improve the efficiency of the economic policy of regional authorities.

It should be noted that the boundaries of the clusters may transcend political boundaries. There is an example of European cluster firms in Germany and Switzerland for the production of chemicals.

In conditions of developing economy clusters contain a smaller number of participants, and differ in their social composition. Insufficient number of clusters in developing countries does not mean that these countries were unable to participate to the competition, but it slows down improvement and increased productivity. To improve the incomes, wages and living standards is necessary to increase the productivity and value of products. The region can work more productive, increasing opportunities, improving products and processes, the cluster needs to develop.

Cluster approach allows to achieve accelerated development of small and medium enterprises. Planned the operation and in the long term cluster in the following sectors of Kazakhstan’s industry: in machine building, petrochemistry, metallurgy, information technology, biotechnology, grain industry.

The most promising development of the cluster grain processing industry in Akmola, Karaganda, Kostanay, North Kazakhstan regions, the dairy - in Akmola, Almaty, East Kazakhstan, Kostanay and North Kazakhstan regions, in the production and processing of fruit and vegetables in Almaty, Zhambyl, South Kazakhstan regions. The potential of development meat cluster is available in Kostanay, Pavlodar, North Kazakhstan regions, rice - Kyrgyz region, fish - in Atyrau, East Kazakhstan, Karaganda regions.

Despite the existing potential for the creation and development of clusters in several areas at this stage it is advisable to allocate as a pilot three clusters in the grain processing industry (Akmola, Kostanay, North-Kazakhstan region), in the dairy industry (Kostanay region), within the fruit and vegetable industry (Almaty, Zhambyl, South-Kazakhstan region).

This choice was made based on the share of these segments in the food industry, the development of domestic producers in these sectors, the availability of prospects for the production of a product and its export. One of the economic sectors in which there is a favorable environment for creation of clusters is food processing, which are important for sustainable growth of the economy. In January-April 2019 the volume of production in food industry of Kazakhstan amounted to 613 billion tenge, an increase of 2.2% for the year. This is the maximum production volume in recent years. A significant proportion (81%) of the volume traditionally takes the direct production
of food, in monetary terms, the figure was 496.7 billion were 1.1% lower than a year earlier.

The growth of production in the food industry have ensured the manufacture of beverages. For 4 months of 2019, the amount of produced drinks made up 116.3 billion tenge - by 19.5% more than in the same period of 2018 (the index of industrial production - 122%). Note, support the food industry through the infusion of capital investment declined. Thus, in January-April 2019 total investment in fixed assets in food industry amounted to 25.9 billion tenge, having decreased by 20.9%. The share of investment in the sector amounted to only 0.9% of total investments in fixed capital of Kazakhstan, a year earlier to 1.2%. Kazakhstan continues to maintain dependence on imported products. in stores 50% of imported poultry meat, 40% of imported sausages, 52% of curds and cheese, and more than 90% imported from abroad sugar.

Over the past ten years the country imported products at $ 10 billion, and to provide wholly domestic demand in production is possible through integrated measures to support domestic producers. To do this, the national chamber of entrepreneurs of Kazakhstan “Atameken” has developed a detailed plan of import substitution for each industry; the complete elimination of the deficit of sugar (400 thousand tons per year), in Kazakhstan it is necessary to additionally introduce into circulation about 150 thousand hectares of irrigated land and build three new plants for processing of sugar beet. In the first stage, government support can be implemented in the creation of infrastructure for irrigation, and to subsidize the purchase of specialized equipment. It should be noted the three regions, the terms of which allow you to place plants for the manufacture of sugar: Turkestan, Zhambyl and Almaty. To reduce the import of dairy products will be able to build 100 large and 500 medium dairy farms, the annual amount of import substitution will exceed $ 250 million. In turn, the creation of all three major poultry farms (about 120 billion tenge of investments) to completely eliminate the deficit of poultry meat. Their implementation will allow to ensure food security of Kazakhstan and create thousands of new jobs. The main factors that determine the choice of the method of interaction of the enterprises in the formation of territorial – industrial cluster, the basic principles of improving the relationships of agricultural enterprises are shown in the Figures 1 and Figure 2.
To regulate the relationship between members of the cluster ensure their common interests, coordinate the individual and corporate goals, the regulation of domestic product, resource, price and other proportions, it is recommended to use appropriate regulatory mechanisms:

- regulations of exchange-distributive relations;
- the prices of products consumed within the cluster and is implemented end products;
- the profitability ratios of the individual stages of the technological chain;
- the order of formation of the centralized funds in case of their creation;
- financial incentives improve the quality of products (intermediate, final);
- conditions and procedure of mutual settlements.

Priority directions of development of cluster system in the agricultural sector of Kazakhstan are to increase competitive advantage.

- manufacturers of agricultural raw materials by providing favorable economic conditions for their cultivation, stimulating producers to increase agricultural production, ensure their basic means of production (seeds, agricultural equipment, fertilizers, fuel, etc.), the development of large and srednetonazhnykh farms along with the improvement of production and economic activity of households;
- enterprises of the industry processing agricultural raw materials through their modernization, provide high-tech, resource-saving equipment, development of waste-free production, deep complex processing of raw materials;
- enterprises system for the procurement, storage, transportation, packing and marketing of agricultural raw materials and finished products through development of alternative forms of procurement and distribution, primary and deep processing of agricultural products and improving wholesale and retail network, the use of effective methods of storing products, etc.;
- development of integrated intersectoral linkages between the agricultural enterprises in the process of moving products from producer to consumer along the technological chain “production-procurement-storage-processing - transport - packing-realization” on the basis of mutual benefit of mutual inductance sides.

Agriculture of Kazakhstan has a high potential for the development of the grain products cluster. The geographical proximity of the participants (enterprises of food and processing industry, engineering industry, agricultural producers, scientific and educational institutions, enterprises manufacturers of packaging material, etc.), allows you to apply the cluster approach in the development of grain processing industry and the integration of its industries in the global division of labor. The emphasis is on deepening the level and increase the complexity of the system of production, storage, processing and marketing of grain through the modernization of production capacity and increase exports to foreign markets.
The purpose of formation and development of the grain products cluster is to create conditions for expansion of domestic production and competitiveness of products from the grain on the basis of formation of integration ties between all members of the cluster.

One of the prerequisites for the formation of the grain products cluster is the presence of large vertically integrated structures, technological processes which are carried out with the full system of the closed cycle from raw materials to finished products through its own sales network. Their effective functioning contributed to the development of not only the grain industry but in related industries (livestock, fodder production, poultry, etc.).

Despite some similarities in the orientation of the closed production cycle, principles and mechanisms of creation and activities of industry clusters and agricultural holdings are fundamentally different (Glotko et al., 2013).

To achieve the competitive advantages of individual companies, it is advisable to come together to present a United front to conquer certain segments of the intra-regional and external markets. But the cluster approach is not contrary to the objectives of the integrated formations of holding type, on the contrary their interaction on the basis of cluster principles is one of the most important prerequisites for the competitiveness of grain products and the formation of industry cluster further development of effective forms of interaction of enterprises of the grain industry with its related industries.
In the process of formation and functioning of the grain products cluster can develop various forms of economic relations between the enterprises - participants. For example economic relations within a single cluster (vertical and horizontal), economic relations between clusters of the main grain regions of Kazakhstan (Akmola, North Kazakhstan and Kostanay regions), and between grain and etc. industry clusters (livestock, etc.). It should be noted that the basis of the grain products cluster in Kazakhstan is of Central Kazakhstan and North Kazakhstan regions. Thus, the share of these regions in the production of grain in the whole, Kazakhstan is approximately 80% of wheat, 90% for oats, the buckwheat and the millet – 40-55 % for barley and bean – 70%. In Kazakhstan grain production allows not only to satisfy domestic needs for grain, but also annually to maintain relatively high export potential taking into account the carryover stocks of last years. Kazakhstan today is a major world exporter of grain (included within the top 10 countries by wheat exports). In addition, in recent years, is a leader in flour export (Taubayev, 2012; Petrikov, 2018).

The main competitive advantage of Kazakhstan wheat in the world grain market are high quality indicators (high amount of protein (protein) (over 12.5%) and gluten (23-28%), improves quality of flour). Annual share of grain grades 1-3 in Kazakhstan is not less than 70% of the total harvest. At the same time, demands from the domestic market and importers are forced to intensify efforts to further improve the quality of the wheat. In addition, much work needs to be carried out on the formation of the brand “Kazakh Zerno”, as of today Kazakh high-quality wheat remains undervalued on the world market.

So, high-quality soft wheat class 3 from Kazakhstan sold for export as the equivalent of the American or the Russian SRW 4 classes with gluten 18%, while gluten corresponds to U.S. HRW wheat with protein content of 11.5-12.5% or spring HRS with a protein content of 14.5-15.5 percent (i.e., hard, with high protein gluten 23-25% or 28-31%, respectively). The traditional sales markets of grain from Kazakhstan are the countries of Central Asia (Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan), the Caucasus (Azerbaijan, Georgia), Iran, Afghanistan and Turkey, with which Kazakhstan has stable relationships in the trade of grain and products of its processing, and can realize stable exports under favorable market conditions One of the promising new directions of export of Kazakh wheat is China and the countries of South-East Asia, the consumer markets which will grow rapidly with the increase of the population (on average, China consumes annually over 100 million tons of wheat.

Depending on the production and consumption of grain regions of Kazakhstan can be figuratively divided into three groups: importing grain; self-sustaining; exporting grain. The first group can be attributed to the following regions: Atyrau, Mangistau, Kyzylorda and South Kazakhstan. The area of arable land per capita 21.3 times lower than in grain-producing areas of the Northern regions and 4.7 times lower than the average for the country.

The second group includes the following areas: Aktobe, Almaty, East Kazakhstan, Zhambyl, West Kazakhstan, Karaganda, Pavlodar region. According to the supply of arable land and other farmland close to the average for the Republic.

The third group includes the major grain producing regions: Akmola, North Kazakhstan and Kostanay region. These regions produce two-thirds of grain in the Republic. Each group has great potential for expansion. Among self-sustaining, you can highlight the ones that have the most favorable economic and climatic conditions for grain production: Pavlodar, Aktobe and West Kazakhstan region. Thus, the structure of the cereal market should be considered, using the concepts of cluster, which allows to identify the interdependence, complementarity between the links, the spread of technology, investment, information, skills and to determine weaknesses that need government support. The cluster consists of the structural units situated in the same area. It allows you to justify the specific mechanism of integration of the structure of the technological cycle “raw materials–processing–sale".
Conclusions

The cluster of grain products in Kazakhstan highlighted the following components: grain producing farms, enterprises for grain processing; engineering companies that produce special equipment; packaging enterprises and organizations for standardization and certification of grain enterprises for the production of chemicals and fertilizers, seed companies, HSP, elevators, research institutes and universities, etc. Recognized that can be created with the cluster export-oriented and clusters, focused on the domestic market. Grain products cluster, unlike others, focuses mainly on foreign market, because the grain is of strategic importance to the economy of the Republic and is seen as a driving force of economic growth in the country. Structural transformations based on the cluster approach is fundamentally necessary to improve the competitiveness of enterprises grain and their products.

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ANTECEDENTS OF ECONOMIC CONVERGENCE IN ASEAN COUNTRIES:
FOREIGN DIRECT INVESTMENT, TRADE, GOVERNMENT SIZE,
POPULATION AND ECONOMIC CONVERGENCE

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Abstract. The main objective of the currents study is to investigate and explore the antecedents of the convergence in ASEAN countries. Foreign direct investment, trade, government size, population are examined as the antecedents of the economic convergence in ASEAN countries. Examining the phenomena of absolute convergence among ASEAN countries is another set goal of this research. Achieving this goal obviously requires different approach, methodology wise. Cross section regression-based studies have utilized what is called ‘regression to mean’ to examine absolute convergence across countries traditional unit root testing procedure developed by Dickey and Fuller (1979) is employed to test for convergence hypothesis. Employing ADF test also serves two purposes: 1) the methods has to be used to provide input for performing simulations to apply SURADF procedure. Developed by Blundell and Bond (1998), system GMM uses additional moment conditions to serve as an improvement in terms of performance of estimators in the models developed in Arellano and Bond (1991). The implication of this finding is that economies that are more open in terms of trade and with high level of government participation are more likely to show high level of convergence to the group average real GDP per capita than economies that less open to trade with little government participation as measured by government final consumption expenditure as a percentage of GDP.

Keywords: economic convergence; trade, ASEAN


JEL Classifications: F23, F1

1. Introduction

Foreign capital attraction capacity of developing countries is another issue that has been largely scrutinized. According to Adhikary (2017), although there is ‘dramatic increase’ in the level of FDI flows into developing countries, the distribution of such capital is highly skewed in favour of a limited number of such countries. With the view to investigate on the determinants of capital attraction capacity of countries, Boateng, Hua, and Nisar (2015) utilized data on eight determinants of FDI inflow for a sample of 138 countries. Results emanating from the work of Boateng et al. (2015); Bayham, (2016) turnout to provide a justification for what Adhikary (2017) observed. According to Boateng et al. (2015), level of inward FDI inflow into a particular country depends positively on the level of development, trade openness as well as low risk. The researchers therefore prescribed for developing economies putting in place policies that would focus on enhancing physical, legal and political environment alongside trade openness. In a similar research carried out on 29 Chinese regions, reported regions with relatively larger size of market tend to attract more FDI inflows than ones with relatively smaller size of
market. Moreover, regional infrastructural development was identified to have direct link with the FDI inflows attraction capacity of a region. However, the researchers identified wage cost of labour as having negative link with the inward FDI of the regions. In a more recent study by Kurul (2017), on emerging market economics, political instability, high corporate income tax rates and trade tariffs are negatively related to inward FDI.

One of the underlying assumptions associated with support for foreign capital is that it has the capacity to facilitate bridging ‘idea gap’ between rich and poor countries. Moreover, Oduro (2016) emphasized on the role of technology adoption via human capital accumulation and international trade as an important determinant of output growth in developing nations. Considering the role of FDI in bridging technology diffusion, employment generation and skills acquisition, poor countries are more in need of FDI than the richer ones. According to Adhikary (2017); Bayham, (2016), less developed countries place higher hope on FDI inflows to pave their ways in alleviating skills and resource constraints. Moreover, the authors observed that the trend of FDI flows across the world is highly skewed in favour of very few countries that provide certain combination of locational advantages.

Looking at the trend of FDI inflows across the globe, it is apparent that while each developing continent enjoys upsurge in its share of FDI inflows, the gap among regions, sub regions and individual countries remains wide. For example, development indicators database of World Bank (2014) reveals that during 1986 – 1990 net FDI inflows to East Asia and Pacific and SSA stood at $71.72 billion and $5.65 billion, respectively. As for the global FDI inflows, the database reveals that for the period 2006 – 2010, low-income economies’ share of the allocation accounts for a meager value 0.54 percent, this compares with 5.56 percent for lower middle-income category. While the share of upper-middle-income countries stood at 21.34 percent, that of high-income economies is 72.56 percent.

Studies linking FDI inflows and economic growth (ECG) are quite numerous, such as Flora and Agrawal (2017) and (Doytch & Narayan, 2016). There are also several studies conducted on the determinants of FDI inflows. Such studies include Adhikary (2017) and Boateng et al. (2015). While some of these studies utilized time series data some used panel data. However, there are too few studies conducted to access the extent to which divergence in FDI allocation and distribution among countries of a particular region affect ECG and convergence (Simionescu, 2016; Bosupeng, 2018). However, few studies conducted on the link between FDI and economic convergences suffers a number of weaknesses. For instance, the work of Simionescu (2016) employs traditional panel date tools that have inherent weakness of inability to handle the endogeneity problem. As a remedy, the existing study employs dynamic panel data method in the form of system GMM. In addition, the study pooled data from both developed and developing economies. By pooling data from both developed and developing economies, the study does not show clearly the impact of FDI inflow on the per capita income convergence of developing economies to the real GDP per capita of developed economies. The current study therefore addresses the problem identified with the work of Simionescu (2016); Boutayeba, (2017).

There are several studies conducted on the process of convergence in the economy. Most of the previous research studies are based on the emerging economies or their comparison with the developed countries. In some studies, the data was used exclusively on the areas in a developed country such as USA. Some other studies have not individually analyzed the developed countries and incorporated the data on the emerging and developed economies to analyze the process of economic convergence (Hussain et al., 2018; Baltgailis, 2019). Overall, the studies analyzing the economic convergence in the developing countries are rate. Particularly, there are fewer researches conducted on the ASEAN countries. The research studies have used information of the developed countries and the findings can be applied to the developed countries only. These research findings cannot be applied to the emerging countries to define and elaborate the process of economic convergence. Based on the identified research gap, the developing Africa region has been focused by this research to analyze the process of income convergence between the economies.

The impact of technology diffusion is a key advantage linked with FDI from the developed economies (e.g. Táncošová, 2019; Tvaronavičienė, 2019; Esquivias Padilla et al. 2019). It implies that higher access to advance
technology enables a poor country to attract high volume of FDI through convergence extension to the per
capital income of developed nations. There are fewer research studies explaining the relation of economic con-
vergence and FDI irrespective of the clear association between these two variables. In this regard, this research
has made clear contribution to the literature of FDI and economic convergence because of shortage of research
on the FDI’s convergence effect.

A single time series equation based on the unit root process of testing on mean deviation group series has been
used by the research studies analyzing the economic convergence. Some research studies have adopted unit root
testing method based on panel data to explain the process of convergence. To study the process of convergence
on a small sample of economies, which are closely located and open for each other, it cannot be wise to use time
series data based on single equation. There are some drawbacks of using traditional unit root process of panel
data. For example, the convergence of panel members to the average of group cannot be clearly discerned to
others by these methods. SURADF (Seemingly Unrelated Regression Augmented Dickey Fuller) has been used
by this research to analyze the convergence phenomenon, which is another contribution of the study.

2. Theoretical and Empirical Review

2.1. Economic Convergence and Trade

The relation between level of disparity in per capital income and trade between size member countries of EEC (European Economic Community) was examined by Samargandi, Fidrmuc, and Ghosh (2015). It was high-
lighted by the researcher that reduction in the degree of disparity in the income level among the ECE countries
is linked with the elimination of trade restrictions between the member countries. Moreover, the researcher
compared the income differentials of trade liberalization with the pre-liberalization period to signify whether
the improvements are caused by trade liberalization or not. The notion that the restructuring by post world war
has contribution to economic convergence among the six member countries was analyzed as well. It was re-
vealed by analyzing the disparity between the three economies joining the EEC that these experienced serious
disparities and it was eliminated after joining EEC.

The relation between income convergence and trade was analyzed by Campos, Coricelli, and Moretti (2019).
Almost 43 countries were covered in the initial sample, which were including the exporters of oil, countries
having per capital income less by 25% of the per capital income of USA in 1960, former communist countries
and another sample of 25 economies. Trade groups were formed based on imports and exports for every coun-
try out of the new sample of 25 economies. For every group, the parameters of convergence were calculated
as the number of countries varied in trade group with a minimum of three to nine for the period of 1960-1985.
The purpose of the research was to investigate whether there is any convergence evidence among the countries
forming trade with regard to per capital income as compared with the countries, which have not developed trade
relations. It was surprising to know that there was the estimate of convergence parameter of less than one for
all the groups (based on exports) except one. This reflects convergence. In 16 cases, the parameter of estimate
was significant at level of 10 percent for the 24 groups having the estimate parameter lower than one. In the
similar way, the estimate of convergence parameter was less than one for 22 groups out of 25 groups (based on
imports). In 17 cases, the estimate parameter was significant at level of 10 percent. Moreover, the formation of
groups based on the combination of export and import based groups gave similar results.

Most of the groups had the estimate of convergence parameter less than one and it evidenced convergence.
In order to analyze whether the highlighted convergence is the result of trade association between the groups
or not, 7300 groups were formed randomly for estimate of convergence models. Out of total, 5000 groups in-
cluded 9 economies and 2300 groups comprised of three economies. It was revealed through the graphing of
parameter that there is more divergence as compared with convergence.

Two contributions were made by Campos et al. (2019). The first contribution was in the sense that the research
used a simple and new method for the estimation of convergence. The annual dispersion of the variable was
taken more into the interest. This approach was a developed way of investigation as compared to the primary method of current income regression against the level of income as proposed by Juknys, Liobikienè, and Dagiliūtë (2017) and Fukase and Martin (2017). The second contribution was the development of relation between convergence process and trade between the countries, which has been an issue neglected by the literature on convergence.

The literature was extended by another study conducted on the influence of trade on income convergence. It was explored by the study that trade supports economic convergence among the countries through enhancing their access to the capital markets across the globe. It was claimed by the research that the countries participating in trade have greater access to overseas debt keeping in consideration the imperfections of the capital markets internationally. In this way, domestic investments can be financed through more funds to the countries with high returns. The countries can grow in a faster way.

A robust and positive relation between the trade openness and access to external debt (determined by the degree of external liabilities) was documented. A remarkable contribution was made by this research in terms of methodology as compared with other research studies conducted on the relation of trade and economic convergence. The transmission process of the influence of trade on economic convergence between the countries was clear in this research. The parameters of convergence were estimated in most the traditional researches including Samargandi et al. (2015); Chang, (2017) for a group of countries, which were believed to participate in trade. It was found that income convergence is resulted through trade. However, the finding can be misleading in a way that the causation effect of trade to convergence was not necessary meant by convergence in the trade liberalization period.

The relation of positive association between income convergence and international trade is one aspect. The level of variation in the reduction of income gap among the economies because of the level of trade between them is another aspect. A study was carried out by Santos-Paulino, DiCaprio, and Sokolova (2019) to explore the reduction level in income gap between the countries due to growth in international trade. Based on the data of export and imports, 127 pairs of the economies were made using the data on bilateral trade. It was revealed through the results of the study that with the increase in intensity of trade, the convergence is enhanced between the countries. The result of the study is in line with the pairings based on imports and exports.

GMM estimation process was used by Githuku, Omolo, and Mwabu (2018) to analyze the influence of trade liberalization on convergence of real income between 36 countries in the region of Asia, Africa, and Latin America. Moreover, the two estimates of sigma convergence were computed in addition to the beta convergence. These two measures included deviation from the regional mean and standard deviation of real per capital income. By adopting the approach of single difference and difference in difference, mixed results were found. The convergence in pre and post liberalization was compared in the approach of Single difference. Alternatively, the pre and post liberalization was compared in ‘difference-in-differences’ method for the economies under research and a control group. The results drawn from the approach of single difference was emphasized because of the difficulty involved in the formation of control group, which confines the heterogeneity between the three regions involved in the study.

Results from Githuku et al. (2018) indicated that there is no significant difference in terms of absolute convergence between pre-liberalization and post liberalization periods for Asia and Latin America. Conversely, for Africa, there appears to be a beta divergence for the periods characterized by trade liberalization. Moreover, the results for sigma convergence are as well mixed. While it was found that there is huge improvement in terms of sigma convergence during post-liberalization periods for the Asian and Latin American countries, liberalization periods are characterized by divergence in the case of ASEAN countries.

In a more recent study, author contributed to the existing body of literature on the relationship between trade and growth by exploring the link between bilateral trade and reduction in income gap. The main objective of the paper was to examine whether with the increase in the intensity of trade between two countries the income
gap between the countries tends to diminish. To achieve the set goal, Choi utilized bilateral data for 63 countries and 62 exporting partners of each country for the periods 1970, 1980, 1990 and 1992. Employing both pooled OLS and random effects panel regression models, results from the research provide additional support for the positive link between bilateral trade and reduction in income gap. In addition, the research reveals the bilateral trade effect on convergence to be more pronounced when the two countries share same language and are located closely. The author therefore concludes that that the mechanism via which bilateral trade aid convergence between two countries is transfer of knowledge, which in turn depends on geographical proximity and common language.

According to Trofimov (2018), there is the possibility of a reverse causality from income convergence to liberalization and trade. In his view, there is the tendency for the countries that are similar in terms of income to liberalize and as a consequence trade more with one another. In his opinion, this possibly therefore calls for undertaking research from the view point of income convergence causal effect on trade and liberalization. In line with this argument advanced conducted a research to investigate whether the argument is a valid one.

Using disaggregated bilateral trade data for a large sample of 165 countries for the years quinquennial years between 1965 and 2000 the author reported a couple of finding. One, evidence of a bi-directional causality between trade in differentiated and reference-priced sectors was discovered. On the contrast, the causality runs from trade to income convergence when data on trade in homogenous product is used. In line with his findings, the researcher therefore concludes that there is evidence that trade induces income convergence.

A careful survey of studies conducted on absolute convergence would reveal that such studies relied basically on cross-section data. On the other end, majority of studies investigating on sigma convergence have utilized panel data regression. However, recent researches have shown some sort of inclination towards time-series approaches to investigating ‘sigma convergence’ in what is referred to as ‘stochastic convergence’. One of the studies carried out using time-series methodology is Huang, Zhu, Du, and Lee (2016); Cossiga, (2018). The researcher explored on the convergence in per capita output of New Zealand and each of her four major trade partners – Australia, Japan, the UK and the USA. Using both bivariate and multivariate time-series approaches on the data covering 1950 – 1992, the author reported a number of findings.

In the case of bivariate approach, using difference between a pair series both ADF and KPSS tests were carried out to test for ‘stochastic convergence’. As revealed by the ADF test, there exist a stochastic convergence in output between Japan on one hand, and the UK and the USA on the other. As opposed by the ADF test, results from KPSS test suggest some evidence of stochastic convergence in the output levels of Australia the USA was observed. Moreover, in order to test for the existence or lack of thereof stochastic convergence in the series for the group of countries, the Johansen likelihood ratio ‘trace test’ was employed. As for this test, the outcome reveals no evidence of stochastic convergence.

Following Huang et al. (2016), similar study was undertaken by Musa (2016). The study involves forming three clusters from a sample of 88 economies. The clusters were formed on the basis of the degree (high, medium and low) of openness of the countries. Using both ADF (drift and trend version) and KPSS tests, unit root tests were carried out on the series of the difference between per capita output of each country and that of the leading country for the three clusters. Although the results from such tests turn out to be mixed, on the balance, there is more of evidence in support of convergence than its absence.

Bivariate analysis of convergence for the three clusters indicates that the high openness cluster comprising of Luxembourg as the leader and 16 other countries has the highest percentage of countries converging to the per capita output of the leader. However, the corresponding percentages for the medium openness and low openness clusters are 40 percent and 45 percent respectively. On the other hand, multivariate stochastic convergence test between groups of economies under each cluster was carried out by employing Ghysels and Miller (2015) ‘trace test’. Moreover, the outcome of multivariate analysis appears to be a sort of affirmation of the bivariate analysis.
Conversely, Raychaudhuri and De (2016); De, (2018) holds countervailing view on the impact of international trade and income convergence across countries. The author is of the view that an extra caution should be exercised in concluding that international trade is a catalyst for income convergence among countries. As noted by Slaughter, the leading papers that investigated on the relationship between international trade and income convergence across countries suffer a number of methodological weaknesses. For instance, in studying the impact of trade on convergence across countries, reduction in income disparity among countries during a given period characterized by trade barriers removal should not be enough to justify that trade has any impact on growth. Instead, there is a need to carry out the studies from causation methodological point of view. Therefore, the fact that there is whole range variables believed to have some impact on income convergence, income convergence after trade liberalization among countries does not necessarily connote that trade is the cause.

Moreover, Raychaudhuri and De (2016) highlighted that the proposition that free trade among nations brings about factor prices equalization does not necessarily translate to income convergence among countries. Slaughter further pointed to the fact that Factor Price Equalization (FPE) theorem is built upon very strict assumptions in such a way that a slight change can render the theory invalid. Giving this problem associated with the theorem, even though factor price equalization may result to income convergence, it is difficult to simply attribute income convergence among countries to trade liberalization.

Most of the studies linking trade to income/growth convergence have used single comparison of at most two groups of countries. Contrary to this popular approach adopted ‘differences-in-differences’ methodology to investigate on liberalization impact of income convergence among liberalizing economies. As opposed by many studies reporting positive impact to liberalization on growth, Slaughter document a negative impact. Analyzing four different post-1945 trade liberalization episodes, the author found that liberalization has divergence effect on income rather than convergence. This result was found in both ‘single difference’ approach and ‘difference-in-differences approach and each of the four liberalization episodes the study covered.

2.2. Government size (GSIZE) and Economic Convergence

The effect of GSIZE on ECG and economic convergence amongst economies revolves around its link to capital accumulation process. Moreover, by whatever measure of GSIZE (Sagongo et al., 2019), economies differ in terms of GSIZE. Such differences may have some impact on the capital accumulation capacity of the economies and by extension convergence process amongst world economies. However, minds of scholars are divided regarding the nature of the relationship between GSIZE on one hand and ECG and convergence on the other.

As highlighted in Afonso and Jalles (2016), theoretically, the view that larger GSIZE is detrimental to ECG is justifiable by the fact that government operations are to a larger extent commonly undertaken with high degree of inefficiency which translates into low productivity and growth. In addition, larger GSIZE is associated with excessive cost relating to regulatory process thereby exposing the whole economic system to a severe burden. At the other end, some scholars maintain the view that GSIZE is beneficial to economies. To these scholars, larger GSIZE play significant roles that are capable of boasting ECG. According to these scholars, among many justifications of positive link between larger government and ECG is that larger governments play a vital role of preventing exploitation of country by foreigners.

Scholar examines the effect of GSIZE on ECG via its role on capital accumulation. Employing two-way fixed effects regression model on the data covering a total of 57 OECD and non-OECD economies, the author finds evidence that GSIZE hampers ECG mainly by hindering capital accumulation. Examining the effect of GSIZE on ECG via the channel of capital accumulation for the sample of OECD and non-OECD economies separately, the author observes the negative effect of GSIZE on capital accumulation to be persistent only for the sample of non-OECD economies. The author therefore concludes that, as opposed to the situation of developed nations, public sector crowds out private sector in developing economies. In a related effort, Nordin, Mawar, and Zainudin (2019) probe on the effect of GSIZE on ECG using a sample of G-7 countries for the period 1960-1993. Findings emanating from the study show evidence that ECG has both long run and short run effects on GSIZE.
In a related study, Tran, Drew, and Noguchi (2018) explores the effect of volatility and composition of government expenditure and revenue on ECG of OECD and EU countries. Interestingly, findings from Afonso and Furceri are in line with. Afonso and Furceri observe that each of the components of government expenditure employed in the study to examine the effect of GSIZE on ECG of EU and OECD member economies turns out to show negative and statistically significant effect of government expenditure on ECG.

Nguyet and Phung (2018) also use data from 19 OECD member countries to examine whether GSIZE plays any significant role in explaining the differences in output growth of the sampled economies. Utilizing random effects model on the data spanning 1971 – 1999, the author come up with the conclusion that GSIZE is generally detrimental to ECG amongst sampled economies. Literature on the link between GSIZE and ECG and convergence is dominated by studies undertaken mainly using data from developed economies.

However, of the few studies carried out using data from developing economies is Afonso and Jalles (2016); Edeme, (2017). The study examines the effect of GSIZE on ECG disaggregating the sample based on economic system with the view to probe whether the relationship depends on the type of economic system. Using data from 51 middle income economies over the course of 1960 – 1985, the author reports findings suggesting adverse effect of GSIZE on ECG and productivity and by extension economic convergence. Moreover, the study examines discovers that the negative effect of GSIZE on ECG is more pronounced in countries with nondemocratic socialist system compared to economies with democratic market system.

In the view of Hajamini and Falahi (2018), studies on the impact of GSIZE on ECG, and by extension economic convergence, are commonly plagued by serious econometric problems. In a bid to provide more robust findings regarding the nature of the relationship between the variables, the authors employ extreme bound analysis on data mainly from a sample of rich economies covering the period 1970 – 1995. Findings from the study appear to affirm the view that GSIZE is detrimental to ECG.

Another study carried out using data on developing economies only is Agostino, Dunne, and Pieroni (2016). The study utilize data on a sample of 43 developing economies over the course of 20 years. One of the contributions of the study is that it investigates the effect of disaggregated government spending on ECG. Contrary to the findings reported in the teeming majority of the studies that GSIZE has negative effect on growth and economic convergence, Agostino et al. (2016); Elshamy, & Ahmed, (2017), find positive and significant relationship between GSIZE, as measured by recurrent expenditure, and ECG. On the contrast, the authors observe that there is negative impact of capital expenditure on ECG. The study therefore suggests that previous studies have found negative effect of GSIZE on ECG due using aggregated measures of GSIZE (Ciocchini, 2017; Coccia, 2017). In line with their findings, the authors recommend governments in developing economies should pay much attention in making appropriate allocation of expenditure to ensure ECG and convergence to the output of relatively richer economies.

2.3. Population Growth and Economic Convergence

Of the implications of Solow (1956) growth model is the proposition that economies tend to convergence in terms of real GDP per capita in absolute terms providing they are similar in terms of savings propensity, technology and population growth. However, economies vary in terms of population growth rates. This leads to the emergence to the term of conditional convergence. According Solow growth model, an increase in population growth rate of a country causes an increase in the break-even level of investment, which in turn leads to lower steady state level of capital. Studies on the determinants of ECG and by extension economic convergence have commonly included population growth rate as one of the determinants of ECG and convergence. For instance, in the words of Caselli, Esquivel, and Lefort (1996) “there is by now both a strong theoretical case and solid empirical support for the view that ECG affects the population growth rate”.

Pioneer among the studies that consider population growth rate as one of the important variables in determining ECG and convergence is the work of Dowrick and Nguyen (1989). The study utilize data for a large sample of
OECD economies over the period 1950 – 1985. Using OLS to regress 1950 level of GDP growth rates of sampled economies against annual growth rates, annual population growth rates and a host of other variables the authors report a number of interesting findings. Before controlling for population growth, the authors observe fewer occurrences on convergence across different samples compared to the results obtained after controlling for population growth rates of economies. This finding therefore implies that population growth rate plays a vital role in determining economic convergence across economies. Moreover, Grier and Tullock (1989) probe on the effect of seven variables on ECG using cross country regression on a sample of 113 world economies comprising of 24 OECD member economies and 89 other economies. Averaging data over five-year non-overlapping periods for 24 OECD economies and four observations for each of the remaining 89 economies the authors employ traditional OLS in estimating the relationship of interest. For both OECD and other economies, the researchers find evidence of positive and statistically significant relationship between population growth and initial level of real GDP per capita.

Glaeser, Scheinkman, and Shleifer (1995) explore the link between urban characteristics in 1960 and urban income and population growth rates for the period 1960 – 1990 for a sample of 203 USA cities. The authors observe that there is a positive link between population growth rate and income growth rates amongst USA cities. On the contrast, observes that there is significant negative relationship between population growth and ECG. Similary, Barro (2001) reports a statistically significant negative relationship between output growth and fertility rate. The author therefore concludes that additional population growth rates come at the expense growth rates in real GDP per capita.

Moreover, estimating Cobb-Douglas incorporating growth model for a cross section of world economies, Benhabib and Spiegel (1994) examines the role of human capital in determining cross country variations in ECG. Findings from the study shows that human capital does not significantly determine variations in ECG across countries. Using the growth rate of total factor productivity as an alternative measure of ECG, Benhabib and Spiegel (1994) find evidence in support of positive relationship between human capita and ECG. Galor and Weil (1993) examines the relationship between fertility rate and capital and output per worker. Results from the study indicate that there is positive feedback from low fertility rate to the growth in output and capital per worker.

Traditional unit root testing procedure developed by Dickey and Fuller (1979) is employed to test for convergence hypothesis. Employing ADF test also serves two purposes: 1) the methods has to be used to provide input for performing simulations to apply SURADF procedure. The RATS codes for performing SURADF test for unit root requires using single equation ADF coefficients as well as the lower triangle variance-covariance of errors obtained by estimating ADF within SUR framework. Finally, besides using single equation ADF output as input for conducting SURADF simulations, using it is deemed important for the purpose of comparing the method with SURADF. Unique to this study, employing SURADF to investigate the phenomena of convergence in ECOWAS would mitigate the problems associated with traditional ADF and other panel unit root testing procedures (Breuer, McNown, & Wallace, 2001).

Examining the phenomena of absolute convergence among ASEAN countries is another set goal of this research. Achieving this goal obviously requires different approach, methodology wise. Cross section regression-based studies have utilized what is called ‘regression to mean’ to examine absolute convergence across countries traditional unit root testing procedure developed by Dickey and Fuller (1979) is employed to test for convergence hypothesis. Employing ADF test also serves two purposes: 1) the methods has to be used to provide input for performing simulations to apply SURADF procedure

2.4. Modeling economic convergence for ASEAN countries

Examining the phenomena of absolute convergence among ASEAN countries is another set goal of this research. Achieving this goal obviously requires different approach, methodology wise. Cross section regression-based studies have utilized what is called ‘regression to mean’ to examine absolute convergence across countries.
However, the traditional ‘regression to mean’ approach has been largely criticized for a couple of drawbacks associated with it. For instance, as contained in Friedman (1992) and Quah and Sargent (1993), the approach is prone to regression to the mean bias. Additionally, cross-section regression approach may not be appropriate for investigating convergence for a small sample of countries (Ben-David & Bohara, 1997). Moreover, by simply regressing initial per capita income against annual averages of per capita income, cross-country regression studies waste a lot of useful information. In view of these, this study employed approach similar to that in Ben-David and Bohara (1997). The model for absolute convergence is shown in equation (1)

\[ Y_{it} - \bar{Y} = \phi (Y_{i,t-1} + (\bar{Y} - 1)) \]...........(1)

where \( y_{it} \) represents per capita income in economy \( i \) at period \( t \), \( \bar{Y} \) is the average per capita income for a group of \( n \) economies during year \( t \). \( \phi \) is the coefficient and the convergence term. A result of \( \phi < 1 \) (\( \phi > 1 \)) indicates convergence (divergence). Let \( z_i = y_i - \bar{Y} \), Equation (2) becomes

\[ Z_{i,t} = \phi Z_{i,t-1} \]...........(2)

equation [2], according to Nelson and Plosser (1982), can be presented within the framework of ADF as:

\[ Z_{i,t} = \phi Z_{i,t-1} + \sum_{j=1}^{k} \partial \Delta Z_{i,t-1} + \epsilon_{i,t} \]...........(3)

where \( \phi \) is the coefficient of lagged dependent variable, \( k \) is the order of lags included in the equation, \( \partial \) is the coefficient of differenced (\( \Delta \)) lagged dependent variable. Therefore, it can be observed that test for convergence narrows down to testing for unit root of \( \phi < 1 \) in Equation (3). \( \epsilon_t \) is the error term . After estimating Equation [3.22], the null hypothesis \( H_0: \beta = 0 \) is tested against the alternative, \( H_1: \beta < 0 \). The test statistic used in testing the null hypothesis against the alternative is given by the formula.

Following Choi (2004), this study hypothesized that as a particular pair of economies convergence in terms of FDI, the economies tend to converge in terms of real GDP per capita

\[ \ln GDPC_{ijt} = \ln RFDIPC_{ijt} + \ln OPEN_{ijt} + \ln GOVSIZE_{ijt} + \ln POPGR_{ijt} + \epsilon_{ijt} \]...........(4)

3. Methodology

Traditional unit root testing procedure developed by Dickey and Fuller (1979) is employed to test for convergence hypothesis. Employing ADF test also serves two purposes: 1) the methods has to be used to provide input for performing simulations to apply SURADF procedure. The RATS codes for performing SURADF test for unit root requires using single equation ADF coefficients as well as the lower triangle variance-covariance of errors obtained by estimating ADF within SUR framework. Finally, besides using single equation ADF output as input for conducting SURADF simulations, using it is deemed important for the purpose of comparing the method with SURADF. Unique to this study, employing SURADF to investigate the phenomena of convergence in ECO-WAS would mitigate the problems associated with traditional ADF and other panel unit root testing procedures (Breuer et al., 2001). In its generic form, the test assumed the true model to be represented by Equation [5];

\[ Y_t = \alpha + Y_{t-1} + u_t \]...........(6)

The test involves using OLS to estimate Equation [2]. However, Equation [2] is likely to be affected by autocorrelation.

\[ Y_t = \alpha + \gamma Y_{t-1} + \delta t + u_t \]...........(7)
As a remedy to such situation, new version of Dickey-Fuller unit root test was developed. Known as Augmented Dickey Fuller unit root test, the method fits Equation [3].

\[ \Delta Y_t = \alpha + \beta Y_{t-1} + \delta t + \gamma_1 Y_{t-1} + \gamma_2 Y_{t-2} + \ldots + \gamma_n Y_{t-n} + \varepsilon_t \ldots \ldots (8) \]

where:
- \( n \) is the number of lags included,
- \( \alpha \) is the constant term
- \( y \) is the series on which test is being performed
- \( \gamma \) is the coefficient of differenced lagged dependent variable
- \( \delta t \) is time trend

Developed by Blundell and Bond (1998), system GMM uses additional moment conditions to serve as an improvement in terms of performance of estimators in the models developed in Arellano and Bond (1991). System GMM estimator can appropriately country-specific unobserved effects in a situation where the lagged dependent variable is included in a model as a regressors. In addition to handling country-specific unobserved effect, system GMM offers a number of advantages over other static and dynamic panel data estimation techniques. For instance, according to Wooldridge (2002) GMM has the capacity to efficiently take good account of twin problems of serial correlation and heteroscedasticity. Moreover, in the view of Baum, Schaffer, and Stillman (2003), GMM has the advantage of ensuring consistency in the parameter estimates even in the presence of arbitrary heteroscedasticity. Finally, the study is not the first to employ panel GMM in estimating convergence. Studies that employed panel GMM include Weeks and Yao (2003). In the words of Nikoloski (2010), “the difference and system GMM estimators can be seen as part of broader historical trend in econometric practice toward estimators that make fewer assumptions about the underlying data-generating process and use more complex techniques to isolate useful information”.

4. Results

The variables of primary interest in this study are convergence in real GDP per capita and FDI. Looking at the magnitude and signs of correlation coefficients for the pair of these variables for each of the two sub-samples, a couple of interesting issues can be highlighted (Table 1).

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>LRGDP</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LFDI</td>
<td>0.417*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LOPN</td>
<td>0.209**</td>
<td>0.331*</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LGOVSIZE</td>
<td>0.028</td>
<td>-0.193</td>
<td>-0.084</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>LPOP</td>
<td>0.041</td>
<td>0.045</td>
<td>0.051*</td>
<td>0.015*</td>
<td>1.00</td>
</tr>
</tbody>
</table>

** and * represents significance at 5% and 10% levels of significance respectively.

Having generated the real GDP per capita deviation series \((y_t - \bar{y}_t)\) for each economy, the next step involves performing unit root test for each of the deviation series for each economy. Rejecting the null hypothesis that the series does not contain a unit root supports convergence. In order to justify the assertions made regarding the superiority of SURADF as against traditional ADF as well as other techniques for performing unit root test, results for traditional ADF test for stationarity were reported alongside the chosen SURADF for each of the 5 series. Results for the tests on deviation series from ECOWAS average real GDP per capita are presented in Table 2.
Table 2. Seemingly Unrelated Regression Based Augmented Dickey-Fuller Unit Root Test.

<table>
<thead>
<tr>
<th></th>
<th>ADF</th>
<th>SURADF</th>
<th>SURADF critical values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>t-statistic</td>
<td>0.01</td>
<td>0.05</td>
</tr>
<tr>
<td>$\text{y}_i - \bar{y}_t$ Indonesia</td>
<td>-1.748[1]*</td>
<td>3.404</td>
<td>2.399</td>
</tr>
<tr>
<td></td>
<td>-3.974[1]*</td>
<td>-3.404</td>
<td>2.399</td>
</tr>
<tr>
<td>$\text{y}_i - \bar{y}_t$ Malaysia</td>
<td>-2.073[1]*</td>
<td>-4.140</td>
<td>3.047</td>
</tr>
<tr>
<td></td>
<td>-3.150[1]*</td>
<td>-4.140</td>
<td>3.047</td>
</tr>
<tr>
<td>$\text{y}_i - \bar{y}_t$ Thailand</td>
<td>-2.111[1]*</td>
<td>-2.858</td>
<td>1.997</td>
</tr>
<tr>
<td></td>
<td>-1.624[1]*</td>
<td>-2.858</td>
<td>1.997</td>
</tr>
<tr>
<td>$\text{y}_i - \bar{y}_t$ Singapore</td>
<td>-1.526[2]**</td>
<td>-4.381</td>
<td>3.268</td>
</tr>
<tr>
<td>$\text{y}_i - \bar{y}_t$ Philippine</td>
<td>-0.874[1]</td>
<td>-4.149</td>
<td>3.062</td>
</tr>
<tr>
<td></td>
<td>0.138[1]</td>
<td>-4.149</td>
<td>3.062</td>
</tr>
</tbody>
</table>

Note:

a) * and ** indicate rejection of the null hypothesis that real per capita GDP of a particular economy is not converging to the group average at 5% and 10% levels of significance, respectively.

b) numbers in brackets represent the lags included to ensure that serial correlation is removed.

c) the critical values for ADF test statistic are: 2.423, for 1% level of significance; 1.684, for 5% level of significance; and 1.303, for 10% level of significance.

d) critical values for SURADF are generated by Monte Carlo simulation using 10,000 replications based on the underlying dataset.

As opposed to the case of nine countries mentioned above, the null hypothesis of no-convergence cannot be rejected in four cases.

Table 3. GMM

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>lnRFDPIC</td>
<td>0.057 [0.017]*</td>
</tr>
<tr>
<td>lnOPEN</td>
<td>0.459 [0.036]*</td>
</tr>
<tr>
<td>lnGOVSIZE</td>
<td>-0.033[0.025]</td>
</tr>
<tr>
<td>lnPOPGR</td>
<td>-0.406 [0.099]*</td>
</tr>
<tr>
<td>Sargan (p-value) Test</td>
<td>10.596 (0.645)</td>
</tr>
<tr>
<td>AR (1) test</td>
<td>-1.322</td>
</tr>
<tr>
<td>AR (1) test</td>
<td>0.122</td>
</tr>
</tbody>
</table>

** and * represents significance at 5% and 10% levels of significance respectively.

The findings in the table 3 indicates that the additional control of population growth does not change the sign of the variable of interest. The estimated parameter is positive and statistically significant at 5 percent level of significance. According to the estimated parameter, one the average, a one percent decrease in the deviation of an economy from group average FDI is leads to 0.057 percent fall in the deviation of the economy from group average real GDP per capita. As for the control variables, positive and statistically significant relationship at 5 percent level of significance was discovered to exist between trade openness and government size on one hand and convergence in real GDP per capita on the other. The implication of this finding is that economies that are more open in terms of trade and with high level of government participation are more likely to show high level of convergence to the group average real GDP per capita than economies that less open to trade with little government participation as measured by government final consumption expenditure as a percentage of GDP.

5. Conclusion

There are several studies conducted on the process of convergence in the economy. Most of the previous research studies are based on the emerging economies or their comparison with the developed countries. In some studies, the data was used exclusively on the areas in a developed country such as USA. Some other studies have not individually analyzed the developed countries and incorporated the data on the emerging and devel-
oped economies to analyze the process of economic convergence. Overall, the studies analyzing the economic convergence in the developing countries are rate. Particularly, there are fewer researches conducted on the ASEAN countries. The research studies have used information of the developed countries and the findings can be applied to the developed countries only. These research findings cannot be applied to the emerging countries to define and elaborate the process of economic convergence. Based on the identified research gap, the developing Africa region has been focused by this research to analyze the process of income convergence between the economies. The literature was extended by another study conducted on the influence of trade on income convergence. It was explored by the study that trade supports economic convergence among the countries through enhancing their access to the capital markets across the globe. It was claimed by the research that the countries participating in trade have greater access to overseas debt keeping in consideration the imperfections of the capital markets internationally. In this way, domestic investments can be financed through more funds to the countries with high returns. The countries can grow in a faster way. A robust and positive relation between the trade openness and access to external debt (determined by the degree of external liabilities) was documented. A remarkable contribution was made by this research in terms of methodology as compared with other research studies conducted on the relation of trade and economic convergence. The transmission process of the influence of trade on economic convergence between the countries was clear in this research. The parameters of convergence were estimated in most the traditional researches including Samargandi et al. (2015) for a group of countries, which were believed to participate in trade. It was found that income convergence is resulted through trade. However, the finding can be misleading in a way that the causation effect of trade to convergence was not necessary meant by convergence in the trade liberalization period.

References


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Abstract. In the current conditions of global competition, various regions are struggling to attract investment and human resources. The most successful are creative clusters in which a new product with increased consumer value is created. However, for the formation of creative clusters it is necessary to provide a number of conditions: tolerance, talents, technology. Tolerance implies the presence of specialists with different competencies and behaviors. A decrease in the tolerance coefficient leads not only to a risk of low susceptibility of cultural indigents from other countries, but also to a decrease in the variety of forms and ways of thinking, creative realization, self-expression, which directly affects the country’s innovative and economic development. By the example of assessing the potential of creative clusters in Kazakhstan, it is shown that the loss of tolerance leads to a risk of a decrease in creative potential. The calculation of mathematical clustering was carried out in the STATISTICA program. The state should ensure multicultural diversity for the conditions of innovative development. By an example of assessing the potential of creative clusters in Kazakhstan, it is shown that the loss of tolerance leads to a risk of a decrease in creative potential. The state should ensure multicultural diversity for the conditions of innovative development. A decrease in tolerance directly reduces the potential for the formation of creative spaces, and is also an indicator of the risk of monocultural development, the lag of Kazakhstan in the educational, scientific and innovative spheres of the international country community.

Keywords: creative spaces; creative cluster; multicultural environment; mathematical clustering


JEL Classifications: C01, C82, M00, M20, O18, O53; P4; P47

1. Introduction

In the context of the globalization of economic and social life, multicultural regions are becoming territories of particular growth. It is in regions with multicultural characteristics that creative spaces are emerging, and creative clusters may arise. Creative spaces are actively emerging in various regions, including their development in the countries of the post-Soviet space. However, the successful practice of managing such entities has not yet been formed; many regions assess their inherent multiculturalism as a risk factor for interethnic conflicts and do not see creative potential. The issue of maintaining multiculturalism or leveling it in Central Asian countries, including Kazakhstan, is particularly acute. The study of the laws governing the formation of creative spaces and the development of a methodology for managing them becomes the task of the region’s economic development, preservation of political stability and the realization of human resources in a creative social environment. The relevance of the study is due to the novelty of the object in question, its complex nature and great potential for the development of the region.
2. Theoretical background


In 2006, American urbanist Simon Evans introduced the concept of a creative cluster and defined it as “a community of creatively-oriented entrepreneurs who interact in a closed area” (Hakimova E., 2013). Sukhovskaya D. interprets the concept of “creative space” as a generally accessible territory intended for free expression, creative activity and interaction of people (Sukhovskaya D., 2013). The authors propose to consider creative spaces on the basis of the institutional approach, as a union on a certain territory of carriers of creative or intellectual innovation, capable of acquiring the form of a product (service) in a conditionally material form. We believe that the creation of creative space is a knot of the interaction of human capital, localized in those places where human communications and the state of the external environment form a synergy of creating products of joint creativity.

In the practice of state management of creative spaces in an urban environment, it is, first of all, providing residents with a creative environment rich in opportunities for aesthetic perception, training, involvement in creativity, with the exchange of skills, experimentation and the realization of their own humanistic vision. (Sukhovskaya D., 2013).

In a narrower sense, public administration considers the main purpose of the creative space as providing platforms for activities to representatives of creative professions. In a post-industrial society, the role of the creative class is increasing both in the degree of product creation and in the formation of aesthetic and social trends.

In Russia, the social influence of the creative class was, in our opinion, exaggeratedly represented in the media and received an oppositional political interpretation. The precedents for the participation of a number of representatives of creative professions in the protest movement distracted the attention of the public and the state from the creative role of creative work and slowed down the support of initiatives for the development of creative spaces on a national scale.

However, at present, creative spaces are no longer perceived in public policy as risk zones and their targeted, programmatic development is taking place.

Creative space can also serve as an office center, while having any non-standard features of the organization of work - for example, interior design, a higher number of recreational areas and territories of informal communication, or implying work in the open space format - such features, according to some researchers, help office employees overcome the routine nature of their work (Havierniková, K., Kordoš, M., 2019.). In addition to the economic function (offices and shops), creative spaces can also perform recreational and educational functions, serving as venues for various cultural events: exhibitions, lectures, film screenings. Functions can also be combined under one roof. The main types of creative spaces are coworking and art centers, art quarters, centers of modern art (Sukhovskaya D.N., 2015; Tkalenko, S., Zhulid-Khristosenko Yu., 2015; Žižka, M., Hovorková, V., Pelloneová, N., Štichhauerová, E., 2018; Bublienė, R., Vinogradova, I., Tvaronavičienė, M. Monni, S. 2019). Creative spaces are usually located in buildings that have lost their original purpose, but subsequently revitalized. Most often, these are former industrial buildings that receive a new function while maintaining their architectural appearance (Vechkinzova, E.A, Goridko, N.P., 2017).

The growth in the number of creative spaces is hindered by both a lack of finances for their organization and a low investment attractiveness. As a result, a creative space, if created, only serves as a temporary stage in the use of a particular territory, designed to increase interest in it, which may be followed by a new change in its
functions (Petrenko, Y., Vechkinzova, E., Antonov, V., 2019). The main source of income for creative spaces is tenant payments, which is why poor cultural organizations cannot make up the majority of them. In addition, many creative spaces are located in former industrial buildings at a time when the cost of renting an unknown place is still low, but are forced to look for a new place with increasing payments (Lincaru, C., Pirciog, S., Grigorescu, A., Tudose, G., 2018.). Investors, as a rule, provide territories for creative spaces exactly until a more profitable application appears, which creates a potential conflict of interest between residents of the creative space and the owners of the territory (Amraoui, B., Ouhajjou, A., Monni, S., El Amrani El Idrissi, N., Tvaronavičienė, M., 2019).

Note that the creative potential of the artist, as well as the entrepreneur, is revealed only if there are special conditions that need to be formed, relying on a single marketing strategy. The terms “innovative development” and “requests of a post-industrial society” apply to the field of creative clusters.

Creative (creative) industries have recently been the object of study from the point of view of economic and cultural policy. There are quite a few definitions and classifications of creative (creative) industries, summarizing which, a set of criteria can be distinguished:
- the activities of such industries are closely related to culture or art (visual art, performing arts, literature, museums, galleries, cultural heritage);
- activities related to media production (press, publishing, television and radio broadcasting, digital media);
- design-related industries (architecture, industrial design, fashion, etc.).

3. Research objective and methodology

Numerous studies confirm that creative (creative) industries tend to clustering, that is, to unite into intersectoral complexes for further development. From the point of view of macroeconomics, clusters are “points of growth” and make it possible to fully realize the potential of the territory. For cluster participants, the advantage is the ability to use synergistic effects in order to get the most out of market advantages.

Creative clusters, creating the area of intersectoral cooperation, create conditions for the professional development of creative workers, increase the level of interactivity of cultural products created within the framework of creative clusters. Ultimately, such clusters contribute to more complete satisfaction of consumer demands in the creative services market.

The growth of the creative (creative) industries sector is associated with basic transformations in economic systems: the development of a post-industrial society and the formation of a knowledge-based economy, the growth of the services sector, and the increasing role of the creative class. The policy in relation to creative (creative) industries cannot be an extended version of the existing cultural policy based on the principles of the welfare economy, but should be considered as an element of innovation policy in the economy as a whole.

Both theorists and practitioners of “creative industries” agree that increasing their economic importance should change the cultural policies of countries and regions in favor of developing a cluster approach to the cultural sphere. And in this regard, the purpose of this study is to use the mathematical clustering method to identify both general trends in the formation of creative clusters in Kazakhstan and already formed clusters. The author of the theory of the creative class R. Florida (2002) proposed a creativity index, in which he included 3 groups of indicators: tolerance, talent, innovative technologies.

Given the above theory of R. Florida and the index proposed by him, the authors developed a method for identifying creative clusters in Kazakhstan based on the method of mathematical clustering. As factors of clustering, indicators of tolerance, talent and innovative technologies were identified. Based on the values of these indicators, the cities of Kazakhstan will be assigned to one or another cluster.

The difficulty in calculating the clusters was the fact that the state statistical agency of Kazakhstan does not
collect all the necessary indicators that make up the Florida index, and a survey of experts brings a subjective position to the study. The authors formed 3 groups of synthetic (composite) indicators of tolerance, talent and technology only on the basis of available data from Kazakhstan statistics.

The synthetic indicator of tolerance for each city representing the center of administrative and regional division of Kazakhstan was calculated as the product of the indicator of variation of nationality and the indicator of the average weighted age of city residents.

The synthetic talent indicator for each region was calculated as the product of the normalized indicators of the number of employees performing research and development (the number of researchers) and the number of security documents issued.

The synthetic technology indicator for each region was calculated as the product of normalized indicators of the number of organizations that created and use new technologies and equipment objects and the number of new technologies and equipment objects created and used.

The calculation of mathematical clustering was carried out in the STATISTICA program.

4. Results and discussion

The values of the synthetic indicators of tolerance, talent and technology are calculated on the basis of statistical data of the Republic of Kazakhstan for each of the cities according to data for 2018 (Table 1).

<table>
<thead>
<tr>
<th>City</th>
<th>Talent coefficient</th>
<th>Tolerance coefficient</th>
<th>Technology coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aktau</td>
<td>0,238</td>
<td>2,107</td>
<td>0,012</td>
</tr>
<tr>
<td>Aktobe</td>
<td>0,051</td>
<td>1,94</td>
<td>0,278</td>
</tr>
<tr>
<td>Almaty</td>
<td>43,997</td>
<td>1,487</td>
<td>22,705</td>
</tr>
<tr>
<td>Nur-Sultan</td>
<td>4,178</td>
<td>1,972</td>
<td>3,213</td>
</tr>
<tr>
<td>Atyrau</td>
<td>0,078</td>
<td>2,119</td>
<td>0,475</td>
</tr>
<tr>
<td>Karagandy</td>
<td>1,029</td>
<td>1,204</td>
<td>0,086</td>
</tr>
<tr>
<td>Kokshetau</td>
<td>0,207</td>
<td>1,17</td>
<td>0,198</td>
</tr>
<tr>
<td>Kostanay</td>
<td>0,15</td>
<td>1,124</td>
<td>0,853</td>
</tr>
<tr>
<td>Kyzylorda</td>
<td>0,026</td>
<td>2,174</td>
<td>0,201</td>
</tr>
<tr>
<td>Pavlodar</td>
<td>0,234</td>
<td>1,249</td>
<td>0,342</td>
</tr>
<tr>
<td>Petropavlovsk</td>
<td>0,009</td>
<td>1,132</td>
<td>0,785</td>
</tr>
<tr>
<td>Taldykorgan</td>
<td>0,469</td>
<td>1,534</td>
<td>0,462</td>
</tr>
<tr>
<td>Taraz</td>
<td>0,052</td>
<td>1,516</td>
<td>0,073</td>
</tr>
<tr>
<td>Oral</td>
<td>2,354</td>
<td>1,701</td>
<td>0,439</td>
</tr>
<tr>
<td>Oskemen</td>
<td>0,278</td>
<td>1,356</td>
<td>0,007</td>
</tr>
<tr>
<td>Shymkent</td>
<td>0,574</td>
<td>1,566</td>
<td>0,62</td>
</tr>
</tbody>
</table>

Maximum value | 43,997 | 2,174 | 22,705 |

Minimum value | 0,009 | 1,124 | 0,007 |

Average value | 3,370 | 1,584 | 1,922 |

*Source:* compiled by the authors

As can be seen from table 1, the lowest average value falls on the coefficient of tolerance - its maximum value is much lower than the minimum value of the talent coefficient and approximately equal to the minimum value of the technology coefficient. Such a low value of the coefficient of tolerance indicates a low national, age and cultural diversity of the population of the cities of Kazakhstan, which can become a serious obstacle to the for-
formation of creative clusters and spaces in Kazakhstan. Indeed, the highest values of the coefficients of talent and technology correspond to the high value of the coefficient of tolerance. The only exceptions are cities located in the oil producing region (Kyzylorda, Oral, Aktau, Aktobe), where international oil developing and producing enterprises with a large staff of foreign employees are concentrated.

According to the logic of mathematical clustering, cities whose synthetic values are close will make up one common cluster. Using the Ward method and the Euclidean distance principle, the authors obtained the following distribution of regions (Fig. 1): Almaty, Uralsk, Nur-Sultan are separately distinguished at a confidence level of 4, and then a cluster that includes 2 groups from the remaining 13 cities of Kazakhstan.

![Figure 1. Clustering of the regions of Kazakhstan on the principle of Euclidean distance](source: drawn by authors)

At lower levels of trust, the Euclidean distance between cities also does not make it possible to visually highlight specific groups, while it is advisable to distribute all regions into 5 clusters.

Based on this, we applied the k-means method, as a result of which we obtained groups of regions that differ in the ratio of synthetic indicators of creativity (Table 2, Fig. 2).

<table>
<thead>
<tr>
<th>Tab. 2. The average values of indicators for clusters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cluster 1</td>
</tr>
<tr>
<td>tolerance coefficient</td>
</tr>
<tr>
<td>talent coefficient</td>
</tr>
<tr>
<td>technology coefficient</td>
</tr>
</tbody>
</table>

*Source: compiled by the authors based on the results of cluster analysis*
Consider the distribution of cities by cluster.

As a result of the mathematical clustering procedure, 3 cities were divided into separate clusters: cluster 1 - Almaty, cluster 2 - Uralsk and cluster 4 - Nur-Sultan.

Cluster 1, presented by Almaty, is characterized by the largest synthetic indicators of talent and technology with a fairly low indicator of tolerance. In a sense, Almaty is an exception, as The status of the former capital of Kazakhstan over the course of 50 years has allowed the formation of a high cultural, scientific environment and the attraction of sufficient financial resources to maintain a leading position in Kazakhstan for a long time in terms of talent and technology.

Cluster 2, represented by Uralsky, is characterized by an average synthetic indicator of tolerance and low indicators of talent and technology. The remoteness of the indicators of this city from other centers of the formed clusters is determined by the frontier location of the city and the active human, information and commodity exchange flows.

Cluster 4, represented by Nur-Sultan, is characterized by rather high indicators of talent and technology (in terms of indicators it is located immediately after the leader, Almaty) and a high indicator of tolerance.

Cluster 3 includes 9 cities, which are characterized by the lowest level of tolerance, and the level of talent and technology indicators is below average. Their list, as well as the distance from the center of the cluster are shown in table 3.

Cluster 3 is heterogeneous in composition: Pavlodar (0.073) is located closest to the center of the cluster, and Karaganda (0.441) is farthest from the center of the cluster. The distance of Karaganda to the center of cluster 3 exceeds twice the average value of the entire population of this cluster to its center, equal to 0.2425. This situa-
tion is due to the fact that Karaganda has a large scientific and technical potential accumulated in Soviet times, which unfortunately is not supported in recent years. According to the calculated data, it can be concluded that Karaganda tends to exit this cluster, or has recently joined it due to worsened trends in recent indicators. In addition to the extreme point of the cluster - Karaganda, one can also distinguish 2 more cities, with almost the same distance to the center of the cluster, also significantly remote from its center - Kostanay (0.313) and Petrapavlovsk (0.3176). This is due to the fact that both cities are bordering with Russia and more intensive cultural, scientific and technical exchange processes take place in them.

**Tab. 3. Cities that make up cluster 3**

<table>
<thead>
<tr>
<th>Cluster center distance</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Karagandy 0,441012</td>
<td></td>
</tr>
<tr>
<td>Kokshetau 0,153641</td>
<td></td>
</tr>
<tr>
<td>Kostanay 0,313083</td>
<td></td>
</tr>
<tr>
<td>Pavlodar 0,073372</td>
<td></td>
</tr>
<tr>
<td>Petropavlovsk 0,317633</td>
<td></td>
</tr>
<tr>
<td>Taldykorgan 0,155173</td>
<td></td>
</tr>
<tr>
<td>Taraz 0,266750</td>
<td></td>
</tr>
<tr>
<td>Oskemen 0,219420</td>
<td></td>
</tr>
<tr>
<td>Shymkent 0,242698</td>
<td></td>
</tr>
</tbody>
</table>

*Source: compiled by the authors based on the results of cluster analysis*

Cluster 5 includes 4 cities representing the oil-producing western regions of Kazakhstan. It is characterized by the highest synthetic indicator of tolerance and the lowest indicators of talent and technology. Unlike cluster 3, the composition of cluster 5 is quite uniform: the minimum distance to the center of the cluster is at Kyzylorda (0.07) and the maximum is at Aktau (0.156). Which speaks of fairly homogeneous processes taking place in these cities.

Their list, as well as the distance from the center of the cluster are given in table 4.

**Tab. 4. Cities that make up cluster 5**

<table>
<thead>
<tr>
<th>Cluster center distance</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Aktau 0,155649</td>
<td></td>
</tr>
<tr>
<td>Aktobe 0,090677</td>
<td></td>
</tr>
<tr>
<td>Atyrau 0,136472</td>
<td></td>
</tr>
<tr>
<td>Kyzylorda 0,070437</td>
<td></td>
</tr>
</tbody>
</table>

*Source: compiled by the authors based on the results of cluster analysis*

General characteristics of cities with shaped creative spaces are presented in table 5.

**Tab. 5. General characteristics of the formed creative clusters**

<table>
<thead>
<tr>
<th>tolerance coefficient</th>
<th>talent coefficient</th>
<th>technology coefficient</th>
<th>average values of the coefficients</th>
<th>cluster characteristic</th>
<th>tendencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almaty 1,487</td>
<td>43,997</td>
<td>22,705</td>
<td>22,73</td>
<td>independent cluster 1 (distance to the center 0 - is the center of the cluster)</td>
<td>formed</td>
</tr>
<tr>
<td>Nur-Sultan 1,972</td>
<td>4,178</td>
<td>3,213</td>
<td>3,12</td>
<td>independent cluster 4 (distance to the center 0 - is the center of the cluster)</td>
<td>formed</td>
</tr>
<tr>
<td>Oral 1,701</td>
<td>2,354</td>
<td>0,439</td>
<td>1,49</td>
<td>independent cluster 2 (distance to the center 0 - is the center of the cluster)</td>
<td>formed</td>
</tr>
</tbody>
</table>

*Source: compiled by the authors based on the results of cluster analysis*
As can be seen from the calculations, in three cities their creative spaces were actually formed - Almaty, Nur-Sultan and Uralsk in the calculations were separated into separate clusters and have the highest average values of three coefficients (tolerance, talent and technology).

The position of the city of Karaganda, which is part of group cluster 3 (the distance to the center is 0.441, is also interesting. The city is located on the outer border of the cluster, farthest from all cities from the center of the cluster. This situation indicates that Karaganda is very different in its indicators from the rest representatives of the cluster, and in previous periods of time the city was not part of this cluster. Indeed, if we carry out calculations for the previous 3 years, we will see that the potential for creating creative space in Karaganda is lost - in connection with the fall of the last 3 years the coefficient values, the city of self-cluster passed the cluster 3.

Thus, from 16 cities of Kazakhstan, which are the centers of the regions, only in 3 cities can one observe the formed creative clusters. It is significant that 2 cities (Almaty and Nur-Sultan) are the former and current capitals of Kazakhstan, which are centers of economic, cultural and scientific life, having diplomatic missions and cultural centers of many states within urban areas. And Uralsk is the regional center of the oil industry in Kazakhstan and is also a border region with intensive cross-border processes of economic and cultural exchange.

A decrease in the tolerance coefficient leads not only to a risk of low susceptibility of cultural indigents from other countries, but also to a decrease in the variety of forms and ways of thinking, creative realization, self-expression, which directly affects the country’s innovative and economic development.

5. Conclusions

Based on the study, the following conclusions can be drawn:

Firstly, creative spaces attract a creative class that does not have strict characteristics by occupation and income, which makes it a place for all kinds of people to unite by age, gender, profession, marital status, etc.

Secondly, such spaces are the cultural center of the city, conducting exhibitions, film screenings, concerts and much more on its territory.

Thirdly, creative spaces are multifunctional, because allow to carry out both cultural and educational events on their sites. It also houses establishments of various kinds - cafes, bars, shops, offices, coworking, etc.

Fourth, creative spaces often reuse abandoned or historic buildings, thus helping to intelligently utilize vacant territories and improve the look of the city by restoring these buildings.

Fifth, creative spaces provide their space for associations of small and medium-sized businesses, which favorably affects the development of these initiatives.

Sixth, a decrease in tolerance directly reduces the potential for the formation of creative spaces, and is also an indicator of the risk of monocultural development, Kazakhstan’s lag in the educational, scientific and innovative spheres of the international country community.

References


SUSTAINABLE DEVELOPMENT FACETS: TAXATION SOLUTIONS FOR THE ENERGY INDUSTRY

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Abstract. International fiscal regulation of transfer pricing solves important taxation problems of company groups to ensure fair distribution of the taxation base between different jurisdictions and in one country. The alternative to the arm’s length principle for similar problems is a concept of formulary apportionment approach. The need to solve such problems is pressing for the Russian consolidated tax groups too, primarily in the technology and capital-intensive industries. Russian Federation’s seven-year experience of creating the consolidated tax groups based on the formulary apportionment approach can be of interest to the specialists in any country researching such issues, because the government has acknowledged the current Russian system ineffective. Economic approach to formation of a sectorial cash-generating unit grouped according to economically integrated businesses and an investor control concept over an investment facility is the basis of our research. Practical calculations were done for the current consolidated tax group, confirming the advantages of this approach for fair distribution of the taxation base for the technology and capital-intensive industries. We have drawn executives’ attention to the solutions enhancing investment attractiveness of the tax groups in conditions of restricted access to information for external users in the IFRS reports of a group.

Keywords: energy; groups of companies; economy; budget; taxation; taxation base; taxation policy


JEL Classifications: E27, H21, G32

Additional disciplines: energetics and thermoenergetics, law, industry

1. Introduction

The taxation consolidation regimes of many states are based on widening opportunities of international consolidation, lower entry requirements and softer restrictions connected to calculation of a taxation base for consolidated tax groups (further CTG). The concept of a group presupposes a kind of restriction, an established perimeter, which depends on the current rules, accepted both in the business and in the country’s legislation. Historically, Gerdes (2008) research dates the appearance of consolidated tax payer groups by the start of the XX century. At that, interest to such form of tax consolidation was expressed by both the government and the taxpayers. A consolidated tax group offers a mechanism redistributing not only direct taxes (such as an income tax or a corporate tax), but also indirect taxes (VAT, excises). At that, international practice sees consolidated
taxation as one of the possible ways of solving the tax optimization problem for business ensuring an additional investment resource to stimulate their industrial development (Barney, 1991). On the other hand, the consolidated taxation system helps the government cut tax administration costs while ensuring effective tax control over taxpayers. The Russian version of consolidated taxation, in force since 2012, was initially supposed to meet the goals. At the same time, after seven years of the CTG institute we can talk about its controversial aspects, which hurt the overall tax income of the budget and a disputable manner of profit tax redistribution between the budgets of the Russian Federation’s regions. Preliminary analysis resulted in suspension of agreements creating new CTG in 2014 – 2018 and amending existing agreements connected with admitting new organizations (excluding reorganizations). The longest lifespan of CTGs registered in 2012-2013 is set for 2023 with some restrictions (Table 1).

Table 1. Russian Federation’s consolidated tax groups in the energy and metals industries

<table>
<thead>
<tr>
<th>CTG’s parent company</th>
<th>Industry</th>
<th>Number of participants as of the date of group creation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gazprom Group</td>
<td>Oil and gas</td>
<td>56</td>
</tr>
<tr>
<td>Rosneft Group</td>
<td>Oil and gas</td>
<td>22</td>
</tr>
<tr>
<td>Severstal Group</td>
<td>Metals</td>
<td>9</td>
</tr>
<tr>
<td>Surgutneftegas Group</td>
<td>Oil and gas</td>
<td>7</td>
</tr>
<tr>
<td>Lukoil Group</td>
<td>Oil and gas</td>
<td>41</td>
</tr>
<tr>
<td>NLMK Group</td>
<td>Metals</td>
<td>10</td>
</tr>
<tr>
<td>NOVATEK Group</td>
<td>Oil and gas</td>
<td>12</td>
</tr>
<tr>
<td>Transneft Group</td>
<td>Oil and gas</td>
<td>14</td>
</tr>
<tr>
<td>TATNEFT Group</td>
<td>Oil and gas</td>
<td>15</td>
</tr>
<tr>
<td>Gazprom Neft Group</td>
<td>Oil and gas</td>
<td>8</td>
</tr>
<tr>
<td>Rosatom Group</td>
<td>Power</td>
<td>34</td>
</tr>
<tr>
<td>Mechel Group</td>
<td>Metals</td>
<td>16</td>
</tr>
<tr>
<td>Nornickel Group</td>
<td>Metals</td>
<td>16</td>
</tr>
</tbody>
</table>

Source: compiled with information from company official websites and information disclosure service

The drawbacks of the current CTG taxation regime may point to poor methodological work on some aspects of its practical use, which allows us to formulate a conclusion on the need to work out measures to improve it taking international taxation practice into consideration. At that, we should take into account that Kazuki (2013) note in their research that IFRS reports of the consolidated fuel and energy groups (further FAEG) show as a rule that the legal, taxation and regulatory systems of the Russian Federation are fraught with changes and the risk of ambiguous interpretation of their requirements, which, together with other legal and fiscal aspects, can create additional difficulties for business. Since tax returns of the reporting groups are unavailable for external users, excluding the controlling bodies, we need access to other sources. Information disclosure on the tax burden, of which an IFRS report can be a source, is important for external users evaluating company potential. At that, financial reports users (except controlling organizations) have no authority to ask reporting Groups of companies for more information, which can be defined as restriction of access to information.

Another problem with a strong influence on the CTG institution development is, according to Nerudova and Solilova (2014), and their industry specifics: according to the Russian Federation Taxation Service, 50 largest taxpayers accounted for 48% of the total tax receipts of the state coffers in 2018. The most important in the structure of budget revenue are the taxpayers of the Rosneft group (U.S.$22 bln), Gazprom (U.S.$19 bln) and Lukoil (U.S. $9 bln). The taxpayers of the Metals and Mining Group ensured a significant part of tax receipts to the budget (10 companies with a total share of tax payments of 5.2%) and financial companies (8 companies and 6.3% respectively). At that, the 2018 computed profit tax for all the CTG amounted to U.S.$ 8.1 mln, with the shortfall of the tax amounting to U.S.$ 4.6 mln thanks to a reduced tax rate on some Russian Federation territories.
This is why the goal of our scientific and practical research is development of the best approach to forming a CTG when calculating a profit tax taking into consideration industry specifics of a business operating in an environment lacking information in IFRS reports. In their research, the authors do not cover the aspects of tax legislation covering control over transfer pricing (CTGs are exempt from the use on the territory of the Russian Federation) and controlled foreign companies, because these questions are a matter for a separate research because of their special features.

2. Theoretical background

The need to isolate property for business purposes preconditioned the appearance of a legal entity, according to Blumberg (1993). We do not intend to research the historical formation of business forms in detail, but we should note that scientific literature describes both legal aspects of establishing this form as well as the problem of a corporate unit as opposed to the state, which regulates activities of corporations by law (Porta, 1999). The companies develop their corporate structures to improve not only production, but also processing and delivery of products to clients to expand their business. In this case, the companies are interested in stable relations with their counterparties, which is hard to attain, if competition is high (Vasiliev, 2019; Yemelyanov et al., 2019; Voronkova et al., 2019). By creating or acquiring companies, by forming the production – processing --- sales chains large business forms corporate units. For example, the oil and gas industry boasts company combinations to create a technological chain – production of resources, their refining, energy complexes, river and seaports, railway transport. At that, the combination of companies strives for production monopolization, according to Fama (1983). The bulk of corporations, whose activities involve production of natural resources, create natural monopolies, according to Barney (1991), and raise budget financing as financial support.

In its turn, business mergers push further development of legislation, which regulates activities of such groups. Most countries have no single notion for consolidated groups as reflected in a research by Christensen (2010). At the same time the notions of the group of companies, a consolidated group, a corporation is widely used in different legal regulations, including the shareholding, commercial, tax, antitrust legislation, in accounting laws, in the stock market laws, etc. At that, each regulatory environment uses its own definition of a group of companies based on special industrial features, its subject, aims and goals of regulation (Korableva et al., 2019). Research on definition of a consolidated group, a corporate group in international scientific literature singled out five key features, which describe several companies as a corporate group. According to Dine (2015), the key and identifying feature of corporate groups is a share ownership or common ownership. In this case, a group of companies includes a parent company and one or more subsidiaries, in which the parent company owns a stake directly or indirectly. Each company of the group, according to Galli (2017), is an independent company, has an independent legal status and its own rights and obligations.

Another identifying feature of a corporate group, according to Ciminelli (2019), is functioning of all members of the group as a single integrated enterprise, done under a unitary business policy of all the companies comprising the group (He, 2009). A unitary economic policy covering as a rule, practically all spheres of business, including marketing, production and sales, financial and human resources policies, helps the group of companies implement a global business strategy, under which the personnel, assets and profits are distributed between the companies in the best way for the group. Another feature, which identifies the borders of a corporate group, is control. There are different points of view on the definition of control for group members (Shatunova et al., 2019; Goloshchapova et al., 2018). According to Correia (2011), control means owning a voting majority, which helps establish a candidate for an individual executive body or the lineup of the board of directors of the company, and as a consequence, control the decisions the company makes. Gerdes I. (2008) in his research says that subsidiaries can belong to parent companies fully or partially, and the degree of control by a parent company depends on the number of voting shares (a share), which it owns directly or indirectly. At that, there is a different point of view, saying that control is not of a technical (50% + 1 voting share), but economic nature as set in the international financial reporting standards IFRS 10 Consolidated Financial Accounting. Such an approach ensures professional judgment and widens consolidation. One of the most popular notions of a Group of companies in
international practice is used with the aim of compiling consolidated financial reports under international standards (Shtefan, 2017). Although a consolidated tax group does not equal as a rule to a consolidated group, which reports under IFRS, we cannot ignore this type of integration in our research. Formation of consolidated groups for the purposes of financial reporting is long and, which is no less important, serious practice in application.

Historically, most researches date the first consolidated reporting, which means the first consolidated Group by 1892 (Dine, 2015). The practice of consolidated reporting covered more and more companies around the world, while the consolidating methodology and lineup of a Group were revised many times. In the current interpretation, a consolidated Group for the purposes of financial reporting is a parent company, which controls one or more subsidiaries. At that, the investor controls its investment with three conditions:

- it has the authority;
- it runs the risks connected with a varying income from his participation in the investment object or has the right to receive such an income;
- has the possibility of using his authority to influence the size of investor’s income (p. 7, IFRS 10).

Thus, a consolidated financial report of a Group represents indicators of two or more companies, linked by legal and economic relations. At that, the key indicator of consolidation is control over investment. This raises the issue of independence of the companies comprising the Group for taxation purposes. For the taxation legislation, according to Hausman (1967), the principle of taxation independence of a company lies in the fact that each company is an independent taxation object, which has obligations to pay taxes regardless of their founders for the taxation purposes. Consequently, according to Sasseville (2016), each company, regardless of whether it is part of a corporate group or not, represents an independent taxation subject, while special relations between the companies’ participants of one corporate group should be taken into consideration for the tax purposes. However, there are several cases in the tax practice, when a strict adherence to the formal independence principle can prove to be ineffective (Fama, 1983) or mean additional difficulties. This triggered the appearance of exclusions in CTG legislation, which say that a link between the companies of one group exists for the taxation purposes. A good example of such an exclusion is, according to Sasseville (2016), the use by many countries of a controlled foreign corporation (the CFC Rules) or an OECD Model Convention for calculation of an income and capital tax, ensuring different dividend taxation rates depending on the holding of a shareholder.

Apart from the formal independence principle, we should note another overriding taxation principle, the principle of tax neutrality when deciding on the acknowledgment of special links between companies for taxation purposes in a corporate group. This principle, according to Spengel (2011), says that an effective taxation system should not weigh in favor of choosing the type of economic activity. For taxation purposes of a group of companies this means that, according to Masui (2004), the neutrality principle ensures that the taxpayer’s choice in favor of a corporate group has no effect on its tax burden, because economic activities are taxable regardless of their form of incorporation. This is why a company operating through its units (as one corporate entity), should have the same tax burden as a company with the same activity done through its subsidiaries (as a corporate group).

At the same time, according to Penttila (2003), operations in the form of a group of companies triggers several circumstances of a heavier tax burden compared with doing business as one company in the absence of special conditions. In particular, when one company of the group incurs losses, while others are profitable, the inability to account for the loss of one company out of profits of the others means that the overall tax burden of the group may be much higher than when profit and loss occur in one company (Ho, 2013). We believe that such a situation contradicts the principle of tax neutrality. This is why there can be special rules allowing companies to account the overall financial result of all companies making part of a corporate group for the taxation purposes to ensure neutrality of the two forms of business for groups of companies. This means that the principle of tax neutrality is a rational basis for acknowledgement of the group of companies’ phenomenon for the taxation purposes and acknowledgement of a group as an independent subject in tax relations.

There are two approaches to forming groups of companies in international practice – legal and economic. The
variety of approaches to forming the Groups, as well as the goals of their creation predetermines the need of a deeper research of such conglomerates’ practice taking into account the economic environment of their businesses and access to information by interested stakeholders, according to Galli (2017).

3. Research objective and methodology

International taxation practice uses, as a rule, a combination of criteria to define a corporate group notion. Different countries set different requirements to the minimal share, which vary greatly. The taxation systems of Australia and New Zealand, which require that the parent company should own its subsidiaries fully, or have a 100% holding to be awarded a special taxation regime (Ekimova, 2017) are at one bracket of the range. The taxation systems of such states as Austria, Italy, and Germany, whose legislation allows them to use a special regime when the stakeholding is above 50% are at other end of the bracket.

Apart from the general requirement to shareholding, some countries set additional conditions. In particular, the Netherlands’ taxation legislation says that if a subsidiary issues different types of shares, the shareholding requirement is valid for each type of shares. Great Britain and Cyprus demand that the stakeholding requirement be met not only as a share in percent of capital and a voting right, but also as a share of profits distributed in favor of the parent company (Mayer, 2009). In most countries, a parent company is only a company registered in accordance with legislation of the country, where the group is created. The Netherlands is an exclusion; it allows a company to become a parent firm if it was created in accordance with legislation of some other states. Besides, Austria, Germany and Italy allows a parent company to be a foreign entity, if it is created in accordance with legislation of a country, which signed a double taxation treaty with Austria, Germany or Italy, and this company has a permanent representation in the country where it creates a corporate group for taxation purposes (Jiao, 2014; Trofimova et al., 2019). Like in case with the parent company, most countries of the world allow subsidiaries registered according to legislation of the country whose rules are used to create a corporate group to make part of the group under a general rule. For example, Austria, Denmark and France allows subsidiaries created in accordance with the rules of another country member of the European Union to make part of the group (Nerudova, 2012). Economic conditions of creation of a group of companies set by legislation of different countries also include a requirement to the form of incorporation of group members, to a special agreement between group members, which cement the lineup of the companies, which make part of the group, their key rights and responsibilities, to the length of a reporting period of each group member. The special feature of Russian CTGs is voluntary participation of companies (members) basing on an agreement. The Group participants create a consolidated financial result to calculate and pay only the profit tax (Figures 1).

<table>
<thead>
<tr>
<th>Financial</th>
<th>Organizational</th>
<th>Legal</th>
</tr>
</thead>
<tbody>
<tr>
<td>• paid VAT, excises, profit tax and MET for a calendar year preceding acceptance to the group totalling no less than U.S.$160 mln (before taxes paid for the goods when transporting across the EEU border);</td>
<td>• special economic zones residents or participants of free economic zones as well as the companies using special tax regimes;</td>
<td>• the share of direct or indirect participation in charter (pooled) capital of no less than 90%;</td>
</tr>
<tr>
<td>• total sales of goods (work, services, other income) of no less than U.S.$1.6 bln, according to accounting (financial) reporting for the calendar year preceding acceptance to group;</td>
<td>• banks, insurers, private pension funds, stock market participants, except when other organizations of the group are banks, insurers, private pension funds, stock market participants;</td>
<td>• net assets according to accounting (financial) reporting as of the last reporting date exceeding the charter (pooled) capital, including for newly accepted members;</td>
</tr>
<tr>
<td>• total assets of no less than U.S.$4.8 bln, according to accounting (financial) reporting as of December 31 for the year preceding acceptable the group</td>
<td>• organizations making part of another CTG;</td>
<td>• not in the process of reorganization or liquidation;</td>
</tr>
<tr>
<td></td>
<td>• organizations not acknowledged as corporate profit tax payers, using the exemption right or applying a 0% rate;</td>
<td>• no initiated legal insolvency (bankruptcy) proceedings, excluding monitoring procedures</td>
</tr>
</tbody>
</table>

Figures 1. Russian criteria restricting creation and application of CTGs

Source: based on the results of the study https://www.nalog.ru/eng/companies/
A member of a consolidated tax group is an organization, which is a side of an existing agreement and meets official criteria. In its turn, the responsible participant of a CTG has the same rights and responsibilities to calculate and pay the profit tax for the group as other taxpayers. The acceptance criteria for a CTG are used when creating (registering) the group and during the whole term of the agreement with duration of no less than 5 years, taking into consideration the following restrictions. If the latest accounting (financial) reporting date is not due as of the moment of filing an agreement on creation (changes) of a CTG to a tax authority, net assets or charter (pooled) capital is calculated according to the accounting (financial) report compiled as of the previous reporting date. A member of a consolidated tax group, which meets the general criteria has the right to disengage from the group voluntarily no earlier than five profit tax periods after the date of its joining the group, including periods of agreement renewal. From a methodological point of view, the taxation base of a consolidated tax group is calculated as a sum of all taxation bases of the group members (Figures 2).

| Special features of taxation management for the responsible member of the group |
|---|---|
| Revenue of each group member | Costs of each group member |

Key profit tax – 20%

Figures 2. Methodological approach to forming the profit taxation base of a Russian group of taxpayers

When calculating the taxation base the order of carrying forward the losses incurred in the previous taxation period are taken into consideration. At that, the consolidated taxation base excludes the income taxable at source of payment. If the group members incurred losses in the tax period before their acceptance to the group, the loss does not decrease the consolidated taxation base of the group. In this case the losses are to be carried forward for the future taxation periods after the disengagement of the member from the group on general grounds. When calculating a consolidated taxation base the losses of the group members are summarized. At that, the total loss of the group shall not exceed 50% of the consolidated taxation base of the current reporting (taxation period). Carrying forward of the losses is done according to general grounds for the corporate profit tax taxpayers. If all the group members had losses in the reporting (taxation) period, the taxation base of the group equals zero. According to the general methodological order, a taxpayer has the right to decrease the taxation base of the current reporting (taxation) period by the amount of the loss received in the previous taxation periods fully or partially with constraints. In particular, between January 1, 2017 and December 31, 2020 the taxation base of the current reporting (taxation) period can be reduced by no more than 50% of the losses received in the previous taxation periods. If a taxpayer incurred losses in more than one taxation period, the carrying forward of such losses to the future periods is done in the order they happened. At that, the taxpayer must keep the documents proving the loss for the whole period of the tax base reduction of the current taxation period. Calculation of the taxation base for each CTG member and the consolidated taxation base for the reporting (taxation) period is done on an accrual basis from the start of the taxation period. At that, each group member must present necessary data for calculation of the consolidated taxation base and the profit tax by the deadline outlined in the agreement (Plaskova, 2017).

The special feature of the methodological approach to the profit tax for Russian CTGs is the tax rate of 20%, of which 3% is paid to the federal budget and 17% to the budgets of Russian Federation regions between 2017 and 2020. We should note that CTG’s consolidated taxation base excludes the income and costs liable to a non-key profit tax rate. For instance, for the part of the tax paid to the federal budget until 01.01.2023, the taxpayers have
the right to apply a rate of 0% on the profit received from tourist and recreational SEZs united into a cluster by
the Russian Federation government, if the profit and loss are accounted separately. The responsible member of
the consolidated group pays the profit tax individually taking into account the profit share attributable to each
group member (subdivisions) in the total amount of profit (Figures 3).

Figures 3. Distribution of consolidated taxed profit of CTGs in Russia

Source: designed by the authors according to https://www.nalog.ru/eng/companies/

At that, the share of a unit of each group participant (as well as their subdivisions) in the consolidated profit of
the group is calculated by the responsible consolidated tax group member under the following formula:

\[ d_i = \frac{1}{2} \left( \frac{p_i}{p} + \frac{A_i}{A} \right) \]  

(1)

where \( \frac{p_i}{p} \) - the share of the average number of employees or labor costs per each group member and a separate
subdivision in the whole and by the group; 
\( \frac{A_i}{A} \) - the share of the depreciable value of amortizable assets for each group member and a separate subdivision
in the whole and by the group.

The responsible member of the group calculates and pays the advance payment and the part of the profit tax
paid to the federal budget at the domicile without distribution among group members and their subdivisions
formed according to tax registration after each reporting (tax) period. The tax (the advance payment) paid to the
Russian Federation regions’ budgets of each group member (a separate subdivision) is calculated according to
the tax rates valid on the territories of the regions for consolidated tax group members and their subdivisions.
Research of international formulary apportionment practice helped us assume that only Russia applies a model
using labor costs/employee numbers and a depreciated book value of fixed assets. The latest factor can be
criticized most, because calculation of the depreciated book value of fixed assets has several specific features.
At that, a financial report does not as a rule disclose sufficient information to assess company operations. We
should also note no state we have chosen for analysis has a legal mechanism of taxation base distribution for
groups of companies, which would be fully comparable with the Russian mechanism thanks to the specific features of state and budget functioning, the differences in the tax system structure. Thus, in Italy, Spain, the Netherlands, France and Japan, which are unitary states, the corporate profit tax, for the calculation of which the tax consolidation regime is used, is paid the central state budget fully, which means there is no need in special rules for consolidated taxation base apportionment (Karpova, 2018). Germany, Australia and the U.S., which are federations, legally ensure payment of the profit tax to one budget (the federal budget). At that, Germany distributes some incomes to regional budgets (Petrov, 2019). However, such distribution is done according to the budget rules. Some states apportion the taxation base under a formula used for the regional and local taxes with the taxation subjects similar to those of the profit tax. Such taxes include a local corporate tax in Japan (Standard Enterprise Tax), a regional business activity tax in Italy (Imposta regionale sulle attivita
di assumersi personali, etc.) and other.
IRAP) and a local business activity tax in Germany (Gewerbesteuer). The taxation base on the aforementioned taxes is apportioned between the subdivisions of a company operating in different regions (Italy) or municipalities (Japan, Germany) in proportion to the following indicators – in Japan to the number of employees engaged in each subdivision, in Italy and Germany to the labor costs. At that, Italy has a special order for some industries, according to Galli (2017), for example, banks’ apportionment is done in accordance with the deposits.

At the same time, international taxation practice uses the concept of formulary apportionment, which can be taken as a practical approach when comparing Russian group taxation together with the taxation base distribution approach:

a) by regional corporate profit tax (the U.S., Canada);

b) by other corporate taxes (Germany, Japan, Italy).

Taking a U.S. three-factor formula of profit tax apportionment as the basis Arthur D. (1960), we will consider the order of its distribution between the subdivisions of one CTG taking into account the share of revenue, property value and labour costs of all participants on the whole with the help of the following formula:

\[ d_i = \frac{1}{3} \left( \frac{S_i}{S} + \frac{P_i}{P} + \frac{A_i}{A} \right) \]  

(2)

where \( d_i \) – the share of a unit in the CTG’s taxation base

\( S_i \) – sales of a unit;

\( P_i \) – labor costs of a unit;

\( A_i \) – property value of a unit.

Each of the three factors in formula (2) has the same weight. However, legislation allows some states to set the weight of each figure on their own (from 0 to 1) making the formula very different from state to state. We should note that the formula is used to tax the business income, while special distribution rules cover non-business income, which relates primarily to passive income in the form of dividends, interest, and royalty. Here we can single out several key factors influencing the forming of CTGs’ taxation bases for the analysis:

- the forming of a consolidated tax group;
- the methodology of profit redistribution;
- the choice of formulary apportionment approach;
- the absence of access to information for the stakeholders because of insufficient information disclosure in a segment format describing taxes in an IFRS report.

4. Results and discussion

The economic analysis of chain substitution, empirical data of the taxation base structure of consolidated tax groups of the Russian Federation were used in our research. Official data of the Russian Federation Tax Service for the periods from the start of the groups’ formation in eight Russian regions and in the whole of the country from 01.01.2013 to 01.01.2018 were used as financial indicators. Justification of such an approach as an empiric basis of a taxation base is its fullest reflection of financial activities of CTGs being a valuation, physical and other feature of a taxation object and is tax imputation per unit of tax base measurement (Figures 4).

Our research done with the help of the chain substitution method allowed us to reduce a trend general for CTGs in all the Russian Federation regions under research. On the whole, their total number decreased as of 01.01.2018 compared with 01.01.2013. At that, the downward trend in all the subjects of a synchronous character because of external economic factors and does not depend on the type of activity of a CTG. In its turn, the research of the behavior of the taxation base of Russia’s existing CTGs in eight regions and in the country as a whole between 01.01.2013 and 01.01.2018 allowed us to reduce mixed vectors of the share changes by taxpayer groups (Figures 5).
The research of changes of the amount of the assessed tax for CTGs in all the Russian regions allowed us to formulate the following statement. Despite the general principles of assessing the tax for the whole country we have discovered the absence of general trends in the change of the figure under research, that is five regions (the Central, Urals, Far Eastern, North Caucasus and Southern Federal Districts) demonstrated a fall in the assessed forecast tax, three regions (the Volga, North-West, Siberian Federal Districts) demonstrated an increase in the assessed forecast tax. This allows us to formulate a hypothesis about a possible redistribution by CTGs participants of the taxation base between the Russian Federation regions. With a great possibility it was caused
by changes in the taxation legislation, allowing each taxation subject to apply a reduced profit tax.

This is why comparative analysis of a reduced rate set by the Russian Federation regions and the size of CTGs’ taxation base helped us formulate the following hypothesis: a reduction of the tax rate leads to an increase of the taxation base of the group, which has a direct influence on redistribution of the taxation base between the regions by CTG participants and results in a variable size of the assessed profit tax for the country on the whole. In this case dependence of changes in the taxation base (y) depends on the tax rate (x) and is described by the following polynomial function: \( y = -467.51x^2 + 155.55x - 12.69 \quad R^2 = 0.9 \). Changes in the size of the taxation base and a real profit tax rate is presented in Figures 6.

![Figures 6. Changes in the size of the taxation base and a real profit tax rate by CTG](image)

Source: based on the results of the study https://analytic.nalog.ru/portal/index.en-GB.htm

This is why we can state with a great degree of confidence that CTGs taxation base migrated constantly between the Russian Federation regions in the researched period thanks to the possibility for the tax payer to choose the indicators in the formula (1) weight \( \frac{P}{P} \) and \( \frac{A}{A} \) when calculating the profit tax on an annual basis with the possibility of migrating to the Russian Federation subjects with a reduced profit tax from 17 to 12.5%.

Since the Russian institution of CTGs is in fact one of the practical examples of the use of the formulary apportionment approach on the basis of its distribution between the Russian Federation regions, a CTG participant operates in a region using a two-factor formula (1). Logically, the deals between CTG participants are the deals, which are not controlled for the purposes of transfer pricing, since the profit tax apportionment between the Russian Federation regions’ budgets is done to a fixed formula regardless of the prices used in the deals. At the same time tax apportionment between CTG participants established by the taxation legislation – remaining book value of fixed assets, an average number of workers (or labor costs) and the absence of the financial results of the taxpayers’ activities in the criteria of tax distribution between the group members hurt revenue of the Russian Federation regions’ budgets. This results in the impossibility for the Russian Federation regions to plan their tax revenues. In our view, the existing mechanism leads to a flawed budget revenue apportionment and deprives CTGs of incentives to increase their taxation base and consequently, higher margins and labor productivity, to cut costs since the criteria for the apportionment are the remaining book value of fixed assets and an average number of workers under Russian Accounting Standards.

Besides, all these conditions deprive the Russian Federation regions of incentives to create conditions for investment and modernization of the companies making part of CTGs on their territories because of the absence of a guaranteed financial effect from the measures for the energy taxpayers. At the same time the measures aimed at reducing the tax paid to the regional budgets from 17 to 12.5% for some categories of taxpayers also
deprived regions of such incentives. Our research shows that the apportionment factors are not grounded sufficiently and call for a third criteria. Such an approach won good reputation in the taxation practice of many states. However, revenue recognized at the location of a buyer, according to Mayer (2009) is used in international practice, but in our view does not take into account special features of costly energy and metals industries. At the same time, revenue is also a relative indicator, since the largest Russian companies have been under foreign sanctions since 2014, and they cannot change it. The need to develop business, upgrade of the fixed assets are not taken into consideration. On top of that, economically integrated related types of business, as a rule, bring an indirect economic profit, for example, cost cuts in conditions of strong competition (e.g. Tarasova et al. 2018). Consequently, the use of the profit before tax in the formulary apportionment approach would be preferable for the energy industry.

The choice of profit before tax by the international auditing firms in reports as an indicator for the materiality threshold for consolidated financial reporting of metals and energy holdings is an additional argument for this indicator. In particular, an auditor’s report compiled by PWC on an IFRS report for the METALLOINVEST holding company says that the scope of auditor’s work covers up to 99% of absolute profit before tax, which is a condition of external users’ trust to this indicator.

This is why we suggest including profit before tax received by the members of CTGs at the venue of their operations into the existing criteria of formulary apportionment approach under the following formula:

\[
d_i = \frac{1}{2} \left( \frac{P_i}{P} + \frac{A_i}{A} + \frac{PT_i}{PT} \right)
\]

where \(d_i\) – the share of a subdivision in a CTG’s taxation base
\(S_i\) – labour costs or an average number of workers in a subdivision
\(P_i\) – remaining book value of subdivision’s amortized property
\(PT_i\) – subdivision’s profit before tax

To check the hypothesis by practical data of existing consolidated tax group METALLOINVEST comprising the following members JSC Lebedinsky GOK; JSC OEMK; JSC Mikhailovsky GOK; JSC Ural Steel, we will calculate the economic effect using formulas 1 and 3 to apportion the taxation base and discover the deviations (Table 1).

<table>
<thead>
<tr>
<th>Consolidated tax group</th>
<th>Average number of employees, people</th>
<th>Remaining book value of amortized property, thousand U.S. dollars</th>
<th>Profit before tax of each participant, thousand U.S. dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>JSC Lebedinsky GOK</td>
<td>9459</td>
<td>791376</td>
<td>1023322</td>
</tr>
<tr>
<td>JSC OEMK</td>
<td>11572</td>
<td>309802</td>
<td>300555</td>
</tr>
<tr>
<td>JSC Mikhailovsky GOK</td>
<td>7540</td>
<td>389796</td>
<td>587196</td>
</tr>
<tr>
<td>JSC Ural Steel</td>
<td>17955</td>
<td>242203</td>
<td>-10647</td>
</tr>
<tr>
<td>METALLOINVEST</td>
<td>352</td>
<td>2387</td>
<td>3301</td>
</tr>
</tbody>
</table>

Source: based on the results of the study using http://m.metalloinvest.com/en/financial-results/

Using formulas 1 and 3 to apportion the taxation base, we calculate the share of each CTG member in development of the consolidated group (Table 2). Following analysis of tables 1 and 2 we can conclude that a third element for calculating the share of a CTG participant is reasonable because:

a) the taxation base using formula 3 is adjusted to the size of profit;

b) a CTG participant with a negative profit receives a less compared with formula 1 tax burden using formula 3, which has a sparing effect, since the key goal of consolidated taxation of groups pursues a positive financial result for all CTG participants.
Table 2. Comparison of different approaches to the tax base apportionment by CTG, thousand U.S. dollars

<table>
<thead>
<tr>
<th>Consolidated tax group</th>
<th>The share of profit calculated using formula 3</th>
<th>The taxation base calculated using formula 1</th>
<th>The taxation base calculated using formula 3</th>
<th>Deviations</th>
</tr>
</thead>
<tbody>
<tr>
<td>JSC Lebedinsky GOK</td>
<td>0.3984</td>
<td>626,093</td>
<td>758,503</td>
<td>-132,410</td>
</tr>
<tr>
<td>JSC OEMK</td>
<td>0.1944</td>
<td>404,881</td>
<td>370,105</td>
<td>34,775</td>
</tr>
<tr>
<td>JSC Mikhailovsky GOK</td>
<td>0.2313</td>
<td>366,883</td>
<td>340,321</td>
<td>-73,438</td>
</tr>
<tr>
<td>JSC Ural Steel</td>
<td>0.1723</td>
<td>497,414</td>
<td>328,060</td>
<td>169,354</td>
</tr>
<tr>
<td>METALLOINVEST</td>
<td>0.0035</td>
<td>8,457</td>
<td>6,738</td>
<td>1,719</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1,903,727</td>
<td>1,903,727</td>
<td>1,903,727</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: based on the results of the study

Consequently, further improvement of the methodology should be aimed at establishment of importance of each factor of the model, which will allow us to factor in added value of each company into the gross added value of the regions more accurately. At the same time, a research on a larger scale by the energy group is difficult because of the absence of information, which external users (excluding the controlling bodies) cannot receive, while isolated holding companies disclose sufficient information about tax effects in their financial reports.

CTGs’ activities are conspicuous for the absence of access to information for stakeholders because of its insufficient disclosure for assessment of group operations. The IFRS financial reports of the companies is one of the sources of information for external users to making investment decisions. Acting in line with IFRS information disclosure requirements, the companies can present minimal information without taking users’ needs into consideration, including taxation of the group. This primarily relates to information about the risks, which can influence investment decisions of external users such as Muchlinski (1999). In opinion of reporting CTGs, the Russian Federation tax legislation allows for various interpretations of deals and operations. This is why a reporting group management’s position on taxes and the documents underlying it can be contested by the tax authorities.

Since tax controls are getting gradually stricter, the risk of the tax authorities’ inspections of taxation base redistribution in a group increases. At that, the fiscal inspections can cover three calendar years of operations prior to the year of inspection while in some cases Dine (2015) earlier periods can also be checked. As a rule, there is an opinion that the management team will protect the Group’s position and interpretations it used when calculating taxes, if they are contested by the taxman. Another component of information disclosure cover recognized tax obligations and assets. Recognized deferred tax assets and obligations represent a profit tax, which can be offset or paid as future payments of the profit tax and is reflected in a consolidated financial report. Definition of a future taxable profit and tax deductions, which can be offset in the future is based on a medium term business plan prepared by the management and its extrapolation for the future.

At the same time, a business plan is based on management expectations, which are considered reasonable under the circumstances (Slepov, 2019). Such information can be stable or not, but financial reporting users should rely on it as true. At the same time, the Groups participating in a CTG can disclose the key tax indicators as they disclose information by segments to meet the information needs of users (Petrov, 2019). Operational segments are represented by business components participating in profit-making activities or activities with operational costs (Ponomareva, 2019). The forming of the segments can be done on different bases (Vasilev and Tung, 2019), in particular, the oil and gas holding companies usually disclose the following information by operational segments:
- production of resource;
- transportation/delivery of resource;
- trade operations to sell resource /products.

The companies, which promote their products in different jurisdictions, are conspicuous for information disclosure by geography and type of product (Gryzunova, 2018). In our opinion, the Groups, which report under IFRS
and make part of a CTG can present information in the segment of consolidated companies. This will enhance informational value of financial reporting and ensure access to information for the users assessing the tax risks and tax effects of the company.

3. Conclusions

By way of conclusion, we will outline the key measures, which, in our view, should be taken to ensure the efficiency of the CTG mechanism.

Since the current rules of consolidated tax group formation does not take into consideration the economic links between economically integrated businesses of a group, including those strategically important for product delivery to the consumer, which as a rule are loss-making, but bring an indirect profit by squeezing out competitors, we believe that the rules of joining a CTG should be different. Scientific literature and assessment of the existing international rules allowed us to make the following hypothesis. CTG should include the parent company and its subsidiaries according to the principle of investor control over investment, i.e. when an investor has the authority, takes the risks related to changing profits from participation in investment or has the right to receive such profit and can use his authority to influence the size of income. At that, consolidation should include only economically integrated businesses related to the core type (s) of activity, including the production-processing-goods promotion chain. The expected effect in this case is the abolishment of a financial threshold when signing a CTG agreement. Taking into consideration taxpayers’ opinion on an ambiguous interpretation of some provisions of tax legislation and the risks of unscheduled fiscal inspections, we think it necessary to ensure the possibility of signing a voluntary tax monitoring agreement to CTGs. In this case, the organization will undertake to disclose fiscal accounting data and information about deals in a real-time regime to the tax authority. Here the advantages of using tax monitoring for companies are:

a) access to the expertise of the Federal Tax Service specialists and as a consequence understanding of tax consequences for odd deals;

b) stability and clarity of the tax burden, which increases investment attractiveness of a business.

Our research demonstrated that the entrance thresholds and other factors form the consolidated tax groups by industry. At that, the formulary apportionment approach does not take into consideration special features of each industry. CTGs usually cover technology and capital-intensive businesses such as oil and gas, metals and mining and other natural resource businesses. This is why we believe that the formulary apportionment approach should take into consideration industry specifics. Our calculations showed that the proposal to include a third indicator, a profit before tax, into the existing criteria for the formulary apportionment approach will help CTGs to get additional advantages aimed not only at boosting the companies’ added value, but also at creation of necessary conditions to develop the energy industry at the regional level. In its turn, it will facilitate improvement of social and economic situation in the provinces.

Since technology and capital-intensive businesses, such as oil and gas, metals and mining and other natural resource industries have to maintain their basic production assets, including fixed assets, the formulary apportionment approach should contain a reliable asset valuation. Asset valuation done under Russian Accounting Standards is not reliable in a formulary apportionment approach. Since the CTG companies compile IFRS reports, international financial reporting standards are the most reliable source of information and fixed assets valuation.

The current formulary apportionment approach fails to reach one of the key fiscal goals of CTG creation – fair redistribution of the profit tax between regional budgets. We believe that most harm to the fiscal goals of the profit tax apportionment is done by regional competition, when regions offer reduced local profit taxes for CTG participants. Artificial blocking of business gravitating towards regions with the least fiscal burden will have no sustainable effect. Using methodologies of profit calculation, the companies can develop schemes to pay taxes on the territories of the regions with the least tax burden, while fully complying with the tax legislation. We believe that this problem could be solved by setting a flat regional tax rate for the groups of consoli-
dated taxpayers. At that, taking industry specifics of the group into account, a reduced rate is possible. The taxpayers participating in CTGs can present information on the key tax indicators by segments in their IFRS reports as they disclose information to take information needs of users in consideration. Operational segments are business components, which participate in profit-making operational activity or activities accompanied by expenses. The segments can be formed with the help of different approaches based on information disclosure by operational segment, by geography, types of products, etc. Thus, the Groups making part of CTGs and reporting to IFRS can present information inside the companies making part of consolidation. The suggested order will significantly increase the information coefficient and ensure access to it to the external users assessing the tax risks and effects of the company. Thus, the changes we recommend aim at improving conditions for the taxpayers and at offering them additional possibilities to use special rules of taxation of corporate groups connected with widening of the number of companies, which can use the CTG regime and removal of the restrictions set for calculation of the taxation base for the profit tax. These amendments, taking international practice of CTG taxation into consideration, will help the government create additional advantages for the largest taxpayers from the technology and capital-intensive industries by raising investment attractiveness of the energy sector of the country.

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How the Financial Openness Accelerates the Economic Growth of Leading ASEAN Economies

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Abstract. This research study has given important implications for regulators through elaborating the association between economic growth, financial openness among the five member countries of ASEAN including Philippines, Indonesia, Thailand, Malaysia, and Singapore. An insight has been provided about the relation of economic growth and trade openness from the practical aspect in ASEAN economies. Therefore, the policy makers are supported through this information to develop, overview, and revise the existing regulations and policies of financial openness. This research study has made significant contributions through analyzing the association between economic growth and financial openness from the theoretical aspect. The study has argued that the current literature is extended by this study through focusing on the developing economies of ASEAN. Banking sector is a crucial institution for any economy and economic growth is negatively influenced through collapse of the banking activities. Further, financial system comes at risk through financial openness, but it has a considerable role in the development of economies. The financial system liberalization is the main factor, which drives economic growth among the ASEAN countries. There is need for the policy makers to review and alter the existing regulations of financial openness.

Keywords: ASEAN, financial openness; economic growth; trade


JEL Classifications: G1, F23, F1

1. Introduction

In last few decades, financial openness has been widely noted around the world. Financial openness is defined as the free flows of cross-country investments which are derived from the liberalized government regulation. According to Erten and Ocampo (2017), the process of financial openness has closely brought together the financial market and institutions around the world. Previous studies have identified few approaches in which the financial system is being opened to other countries. Among them are financial liberalization, capital account deregulation, relaxation in the cross-country savings and investment and deregulation in current account transactions (Ezeanyeji Clement, 2016; Cortés & Strahan, 2017). Benefits of financial openness to the financial system have been highlighted by the previous literature. According to Norlida (2017) and John (2016), financial openness will increase the risk sharing and risk diversification activities that would reduce the overall investment risk of the investors. Next, the financial liberalization also increases the efficiency in capital allocation which could improve the functions of the financial market. As noted by Nyasha and Odhiambo (2018) and Shahbaz, Rehman, and Muzaffar (2015), financial liberalization enhances the investment and savings activities.
by reducing the government controls. As the financial constraints being eliminated by the process of financial deregulation, the investors are being compensated with the level of returns that is appropriate with their investment risks.

Therefore, the liberalized financial system would benefit the poor and rich countries by promoting venture opportunities and financial development. Thus, the economy gains benefits from the efficiency in capital allocation in the deregulated financial market. In addition, according to Marshal (2016), financial openness has increased the investment activities which lead to improvement in the economic activities. According to these studies, the financial openness has increased the stock market productivity and liquidity which benefit the investors and companies in the long run.

On the other hand, financial openness also has few disadvantages. According to IMF (2007), higher capital account inflows would weaken the macroeconomic stability, depreciate the local currency and also deteriorate the capital account. According to Converse (2018), financial openness could also increase the risk of contingent and crisis. They argue that the international fund increases the volatility movement in capital account and also liquidity in the financial system. This has resulted in few unwanted consequences such as financial crisis, bank runs and credit crunch.

Despite the risk associated with financial openness, the role of financial openness in the economic development is still considered to be vital to the policy maker. Previous studies have proven the positive impact of financial openness on the economic growth (ECNG) in both developed countries (Al-Shayeb & Hatemi-J, 2016; Norlida, 2017) and developing countries (Hye & Wizarat, 2013; Fang, Zakaria & Shokory, 2016). They have highlighted few reasons on this positive relationship such as increment in productivity, spillover effect, risk sharing and reduction in asymmetric information.

In theory, financial openness is conducted to improve the ECNG by increasing the investments activities, capital flows transaction and enhancing the competition that lead to higher ECNG. According to Obstfeld and Taylor (2017), financial openness can also directly influence the productivity factor such as enhancing corporate governance, encouraging financial development and leading to higher ECNG. However, the previous studies that examine the relationship between financial openness and ECNG have produced mix findings. There are few issues and problems related to the relationship between financial openness and ECNG. Although, financial openness is expected to have positive impacts, however it also reduces the ECNG through various channels. Firstly, the impact of international financial liberalization process increases the probability of financial crises that leads to the decrease in the ECNG (Rancière & Tornell, 2016). The spill over effect of the financial crisis has been transferred to other countries from the liberalization process. The significance of financial openness has increases over the past few decades around the world. The free flow of investment across the countries that are the result of liberalized government regulation is referred as financial openness. The institutions and financial markets have come closer around the world in financial openness process (Erten & Ocampo, 2017). Few approaches have been identified by previous studies that in which the finances are open for other economies. These approaches include the relaxation of saving across countries, deregulation in transactions of current account, deregulation of capital account and financial liberalization (Ghasemi, 2016; Cortés & Strahan, 2017).

The previous studies have highlighted the advantages of financial openness for the financial system. The activities of risk diversification and risk sharing increase with financial openness and the risk of overall investment for the investors is reduced (John, 2016; Marshal, 2016; Norlida, 2017). Further, the capital allocation efficiency increases with financial liberalization that can increase the financial market functioning. Nyasha and Odhiambo (2018) and Shahbaz et al. (2015) highlighted that financial liberalization improves investment and saving activities by reduction the government control. With the elimination of financial constraints through financial deregulation, investors are given the returns suitable with the risks of investment.

Both the rich and poor economies are benefited through the liberalized system of finance by enhancing the
opportunities of venture and financial development. Therefore, benefits are received through capital allocation efficiency in the market, which is deregulated. Moreover, the investment activities have increased through financial openness, which result in better activities in the economy (Marshal, 2016; Goral & Akgoz, 2017). Some research studies have claimed that the productivity of stock market and liquidity has increased through financial openness that gives advantage to the companies and investor in long term (Figure 1).

![Figure 1. ECNG in ASEAN Countries](source: World Bank)

The figure shows the picture of economic turmoil in ASEAN economies, indicating an overall decline in ECNG in these countries. Meanwhile, the figure 1 shows high economic turbulence in Thailand. There are some disadvantages of financial openness. The macroeconomic stability is weakened with greater inflow of capital account, which depreciates the capital account as well as local currency (IMF, 2007). It has been signified by researchers that the crisis and risk of contingent increases through financial openness (Joshua, 2016; Converse, 2018). The researchers have argued that the financial system liquidity and volatility movement of capital account increases through international fund. Some uncertain consequences including credit crunch, bank runs, and financial crisis can be the outcomes of financial openness.

Irrespective of the fact that there are several risks linked with the financial openness, it has a considerable role for policy makers in economic development. It has been proved by previous research studies that financial openness has a positive influence on the growth of developed and developing economies (Haque & Chandio, 2013; Al-Shayeb & Hatemi-J, 2016; Norlida, 2017). Some causes for the positive association have been signified by the researchers including spillover effect, increase in productivity, reduction in asymmetric information and risk sharing.

The ECNG is improved through financial openness through increase in the activities of transactions of capital flows, investment activities, increase in competition, which result in superior economic performance. The productivity can be influenced by financial openness in a direct way including the promotion of financial development and improving the corporate government resulting in better growth of economy (Obstfeld & Taylor, 2017). The relation between ECNG and financial openness has been examined by previous research studies, which have revealed mixed results (Asongu & De Moor, 2017; Herve, 2018). The relation of ECNG and financial openness has certain problems and issues. There are likely to have positive influences of financial openness but it can reduce the ECNG in different ways. The chances of financial crisis increase through the influence of the process of international financial liberalization, which results in lower ECNG (Rancière & Tornell, 2016). The liberalization process transfers the influence of financial crisis to other economies.

Financial openness results in higher competition, which creates a negative influence on the local players in the market. A contestable market is created by financial liberalization that creates higher performance in terms of efficiency and competition in the banking sector. However, better technology is available to the foreign players, which gives them advantage and enable to focus on the sector, which is profitable rather than risky. In this way,
the risky projects are left for the domestic players (Claessens & Van Horen, 2015). The issue of asymmetric information is caused by financial openness, which can create problems for the financial system. The best returns with lowest financing cost are provided by the domestic financial institutions through competition. The process of assessment can be sacrificed for higher returns. The capital formation is damaged and ECNG declines because of symmetric information (Rancière & Tornell, 2016).

Moreover, issues of moral hazards are created through integrated financial system due to increase in the pressure for competition. The efforts of monitoring and screening are reduced by the lenders for gaining higher profits in the liberalized system. The risk taking are promoted by financial openness and result in decline of ECNG and banking crisis (Alessi & Detken, 2018). The banking system is harmed by the liberalized system through activities involving risk transfer (Norlida, 2017). More risk is taken by the banks when the opportunities of hedging are not successful, which result in instability of the banking sector.

2. Literature Review

The significant of financial system liberalization has been highlighted by the financial liberalization theory, which was developed by Nyasha and Odhiambo (2018) and Shahbaz et al. (2015), in improving the growth of economy. The financial repression including the reduction of interest rate, government lending and tightening of the capital movement causes problems for the funds flow in the economy (e.g. Luzgina, 2017; Nikitina et al., 2018; Baltgailis, 2019, Sasongko et al., 2019; Fabus et al. 2019; Sriyana, 2019; Dalevska et al., 2019; Vorotnikov et al., 2019). The credit is limited through financial repression to the profitable projects only. The decrease in return for the investors leads to reduction of ECNG.

The credit efficiency is increased through financial liberalization through funds distribution to the productive sector and it improves the financial saving because of increase in rate of interest. The economic development is reduced through repressed financial system due to misuse of funds by the government (Hye & Wizarat, 2013). The level of investment and savings is reduced because of controlling the lending and deposit rates by the government. Therefore, reduction in control of government in the financial system because of liberalization of interest rate, the intervention of government is reduced improving the allocation of investment/savings to the profitable industries. These allocations of funds to the productive sector result in superior ECNG and development.

The previous research studies have tested the association between ECNG and financial openness with reference to the developed as well as developing economies. A positive association has been concluded by some studies for the relation of ECNG and trade openness over a sample based on 26 economies including United Kingdom, Spain, Germany, Slovakia, Netherlands, Greece, Portugal, Poland, and Sweden (Ishak, 2016; Ehigiamusoe & Lean, 2019). The ECNG was estimated using proxy of GDP and it was found by the study that a positive influence is created by financial openness on capital accumulation, ECNG, and efficiency growth during the years 1990-2007. It was argued by the author that the increase in productivity could be defined by the influence of financial openness created on ECNG through financial liberalization. In the similar way, the relation between ECNG and financial openness was analyzed by Norlida (2017) for Poland over the period of 1990-2002 through use of GCT (Granger Causality Test) and EGT (EngleGranger Test), and ADF (Augmented Dickey-Fuller Test). A positive relation has been indicated for the relation of ECNG and financial liberalization. Moreover, it was found that the ECNG is enhanced through financial liberalization in Korea. The index of financial liberalization developed by Bouzid (2016) was used in the research that is based on interest rate, financial market deregulation, and barriers to entry, banking sector privatization and improving the prudential guidelines. It has been agreed by these studies that economic development is greatly influenced through financial openness. Alternative, an insignificant relation between ECNG and financial liberalization of Greece was discovered by Al-Shayeb and Hatemi-J (2016) by using data for period of 1990-2009. It has been argued by this research that the intended outcome is not provided by trade openness to the foreign participants set by the government.

The literature based on the emerging countries has been discussed in the next part. Some research studies have agreed that the ECNG is positively influenced through financial openness. A study was conducted by Okafor,
Onwumere, and Chijindu (2016) on the association of ECNG and trade openness for Pakistan. Analyzing the period of before (1965-1986) and after liberalization (1987-2008), it was found by the research that there has been an increase in ECNG after the liberalization. In the similar way, the relation between ECNG and financial liberalization was analyzed by Norlida (2017) by using before and after liberalization period for Pakistan. ECM and OLS method was used for the period 1972 to 2010. It was found the study that there is a positive relation between ECNG and financial liberalization of Pakistan. Moreover, there is a negative association between ECNG and lending rate, which is consistent with the theory of financial liberalization.

Some recent studies have found that there is positive association between ECNG and trade liberalization (Okafor et al., 2016). These research studies were done for different periods. The study Okafor et al. (2016) was conducted for years 1960 to 2008 conducted study for the period 1972-2010. The study was conducted for 1972-2011. Therefore, the positive impact created on ECNG by financial openness is clear. The studies conducted on a single country have revealed a positive association between ECNG and financial openness. There is a positive association of inflation and trade openness with ECNG. The influence of capital account liberalization was analyzed by Muhammad and Hye (2015) on ECNG over 1970 to 2004 by using VECM (vector error correction model) and OLS regressions. A positive and significant influence has been revealed between ECNG and financial openness. Moreover, a positive relation was found by a study done in Ghana between ECNG and financial liberalization for 2000-2003. The ECNG is enhanced by financial deregulation through incorporation of variable including monthly savings, interest rate, and GDP. The level of savings is increased by high rate of interest and in this way economic development is improved.

A study was conducted in Turkey to find the relation between financial development, financial liberalization, ECNG, and financial crisis for the years 1980-2010 through use of granger causality tests and co-integration. Positive relation has been discovered by this study for financial development, financial openness, and ECNG. Therefore, ECNG is based on financial development and financial openness. It was found by Mohammed (2017) that ECNG is improved through financial openness in Iran. The researcher incorporate the variables including reserve requirement ratio, domestic credit, GDP, index of financial liberalization, human knowledge accumulation, and development technology in the model for regression.

Bakari, Mabrouki, and Othmani (2018) found similar results in their study conducted on Sri Lanka. The researchers employed the ARDL (autoregressive distributed lag) approach, which lead to the development of relation between ECNG and financial openness. This shows that long time is required for achieving the benefits of financial openness. Some studies have found a negative association between ECNG and financial openness. A study was conducted by Andabai (2019) in MENA countries for years 1986-2010 through incorporation of variables such as dummy variable of liberalization, GDP, share turnover, trade openness, inflation rate, domestic credit, and market capitalization. It was found that there is negative relation between ECNG and financial openness. However, there is a positive association between ECNG and FDI.

In the similar way, a negative relation was found in Brazil between ECNG and capital account liberalization for the period 1994-2007. The ECNG is dampened by the increase in activities of financial liberalization in Brazil. The influence of financial liberalization on growth of economy was found by Ijaz and Idrees (2016) through use of error correction mechanism and co-integration over the years 1974-2002. A negative and significant relation was found between ECNG and financial openness that reveals that the financial openness in Bangladesh was not successful. The results are in line with the study of Qamruzzaman and Jianguo (2017). Irrespective of using different variables and periods, both the studies have agreed that a detrimental influence is created by financial openness on ECNG (Ijaz & Idrees, 2016; Qamruzzaman & Jianguo, 2017).

Some studies in literature have not found any relation between ECNG and financial openness. A study conducted by Naveed and Mahmood (2019) on Pakistan for years 1971-2007 by using ADLM (autoregressive distributed lag model) to analyze the influence of financial liberalization on ECNG in short and long-run (David & Jake, 2017; Helen et al., 2017). These research studies have not found any significant influence on ECNG created by financial liberalization in short as well as long-run. In the similar way, it was discovered that there is
no relation of financial openness with ECNG (Mayorova et al., 2018; Hussain et al., 2019).

The last part of the literature review is based on the research studies, which have work on both the developed and developing economies. Some studies have found that the economy is positively influenced by financial openness. A study was conducted on a sample of 45 emerging economies such as Chile, Poland, Malaysia, Indonesia, Singapore, Philippines, Thailand, and Korea. The researchers employed generalized method of moments (GMM). It was found that the ECNG is positively influenced through financial liberalization. In the similar way, a study was performed by Hoang, Huan, and Linh (2016) on 10 new economies of European Union including Hungary, Czech Republic, Latvia, Lithuania, Poland, Malta, Turkey, Estonia Slovenia, and Slovakia for the years 1995-2007.

Different types of variables have been used in this research including FDI, GDP per capital, real human capital, trade openness, and de facto financial openness. It has been argued by researchers that the key driver for growth of economy is financial openness for the economies used in this research. In the similar way, a positive relation was found between ECNG and financial openness for 61 economies such as France, United Kingdom, Germany, Greece, Australia, Malaysia, Singapore, Philippines, and Thailand for years 1973-1992. Moreover, the studies conducted on cross-country analysis have given mixed results for the relation of ECNG and trade openness. Six developing economies including Philippines, Thailand, Indonesia, Malaysia, Singapore, and Korea were used by Eng and Wong (2016). The relation between ECNG and financial liberalization was examined in this research for 1980-2002 by using GMM (generalized method of moments), LS (least squares method) and TSLS (two stages least square). It was found by results that there is positive relation between ECNG and financial liberalization in case of developed economies and a negative relation for the developing economies.

Moreover, mixed results were found for the relation of ECNG and financial openness using a sample of 27 emerging countries such as Japan, Italy, Austria, France, Australia, Belgium, Indonesia, Thailand, Philippines, and Malaysia for the years 1977-1999. In contradiction to the study of Eng and Wong (2016), a positive relation between ECNG and financial openness has been revealed. However, there is negative relation between ECNG and financial openness.

3. Data Description and Measures

This study employed the balanced panel data for the five ASEAN economies, namely Singapore, Philippines, Thailand, Indonesia, and Malaysia. In the ASEAN region, these economies hold a major position and due to this they are included as samples in this study (World Bank, 2017). Data for the control variables i.e. government and trade expense and independent variable i.e. financial openness was taken from the World Development Indicators (WDI). Whereas, data for other control variables, i.e. official exchange rate and inflation and GDP were obtained from IMF. A balanced panel data for is developed for the time period 2000-2014, resulting in a total of 75 observations.

ECNG

ECNG is taken as a dependent variable and is represented with the log of GDP in terms of USD. Gross Domestic Product (GDP) is one of the commonest measure for determining the ECNG and economic size. Therefore, the higher ECNG levels bring increase in the economy’s level of GDP.

Financial Openness

The current study used Index for measuring the financial openness. This index is also referred as KAOPEN index and is generally used for assessing a country’s level of financial openness. It includes four main components, these are: limitations on current account transactions, regulations for product delivery in international market, multiple exchange rate, and constraints of capital account movements. Thus, the higher the value of this
index the greater will be the financial openness. According to the literature financial openness positively influence ECNG (Okafor et al., 2016). Financial openness offers various benefits to the economy, in the form of risk diversification and risk sharing, enhances a country’s investment activities, and improves the capital allocation efficiency (John, 2016; Norlida, 2017). Afterwards, the data for net FDI inflows is employed to perform the robustness test. FDI is chosen as a proxy variable for financial openness, since it measures the international investors’ inflows of external capital funds in the domestic economy. Furthermore, a study has attempted to observe the significance of FDI as a key economic development source. A few previous researchers Adali and Yüksel (2017) have also used this variable in their studies. Andabai (2019) and Hoang et al. (2016) also investigated the nature of association among ECNG and FDI net inflows, and reported a positive association between them. The FDI inflows help in achieving ECNG through its contribution in the international trade activities, infusing skills and technological spill over, assists in developing a competitive business environment, and also helps in the human resource development.

Inflation

Inflation is the first control variable that is included for the regression. Inflations refers to a persistent increase in the general price level of products and services for a certain time period. This study measures inflation by using a Consumer Price Index (CPI). Researcher Andabai (2019) and Naveed and Mahmood (2019) reported that ECNG declines during higher levels of inflation. The cost of production, borrowing and living increases with higher inflation, which would result in the reduction of economic activities and consumption, thereby leading to an overall decline in the economic development of a country. Thus, literature indicates a negative relationship between ECNG and inflation.

Official Exchange Rate

For every country, the exchange rate movements are crucial, as these movements affect the productions, and prices of raw materials and products. This variable is added as a second control variable in this study. It is measured by taking official exchange rate at a local currency unit, means a country’s local currency is obtained in terms of 1 USD.

According to economic theory, if the official exchange rate increases, it shows a depreciation of a country’s local currency value against 1 unit of USD, whereas, an appreciation in the value of local currency would positively affect the country’s ECNG. A few studies analyzed this relationship and found a significant positive association. A possible reasoning for this positive relationship is the cheaper importing cost, such as price of raw materials and foreign products. Thus, a negative relationship is expected to occur between ECNG and official exchange rate, since the local currency depreciates with the increase in official exchange rate.

Trade

The third control variable included in this study is trade. Trade variable is calculated as a percentage of GDP, by aggregating a country’s total imports and exports of goods and services. Several empirical study Julia, Jouni, and Timo (2015) has found a positive impact of trade on the country’s ECNG, which confirmed that higher levels of trade brings improvement in the economic development. A country’s import and export activities provide beneficial outcomes in the form of expansion in production, support to the local business, expansion in job opportunities, and increase in national income which directly contribute to the ECNG. Therefore, a positive relationship is expected to exist between ECNG and trade.

Government Expenses

This study also included government expense as a control variable. It includes expenditures on education, health, defense and infrastructure. According to the literature Oche (2018), government spending is a significant component of ECNG. Therefore, an increase in the government spending brings improvement in the eco-
nomic prosperity, such as, increasing education expenditure improves the productivity and efficiency of workers, which result in their positive contribution to the national output and income. Thus, a positive relationship is expected to exist between ECNG and government spending.

4. Methodology

The present research uses a panel estimation technique for exploring the impact of political instability and corruption on savings rates in Association of Southeast Asian Nations. The panel estimation technique is assumed as an appropriate technique as it focuses on the countries that are part of ASEAN. Following are the reasons for adopting panel estimation approach (Baltagi, Bratberg, & Holmås, 2005; Basheer et al., 2018).

- It provides panel data that resolves biasness i.e. unobserved heterogeneity that can arise as a result of employing cross-sectional dataset.
- Panel data exhibit dynamics which are hard to identify in cross-sectional dataset.
- Panel data contains rich content and provide observations in large number.
- Panel data displays less collinearity between set of variables, offer more variability, increased efficiency in time series, and higher degrees of freedom.

Thus, the study employed a panel estimation approach for computing saving models for ASEAN. These techniques involve Panel Corrected Standard Errors and Two-Stage least squares instrumental variables. According to it better performance results than FGLS. It also deals with any irregularities that arise from spherical errors, thus results in drawing meaningful conclusions from the TSCS estimates. Numerous recent researches Basheer et al., (2019) have used Panel corrected standard error technique along with Seemingly Unrelated Regression analysis.

Many researchers have argued that income growth and per capita income are derived from savings, indicating that income growth or per capita income do not solely leads to more savings rather higher savings also results in income growth or increase in per capita income. Therefore, estimating values of coefficients using OLS will give bias results. Such causality among variables causes a correlation among error term and control variables, hence violating the presumptions associated with linear regression model. Furthermore, it is difficult to isolate the impact of any individual variable on savings, when the estimation results in an association of variables with error terms. This issue can be resolved by employing the Two Stage Least Squares technique, in order to assess the relation among variables (bin Hidthiir et al., 2019). This technique helps to idBell and Jones (2015). Time series cross sectional data usually exhibits heteroscedasticity and autocorrelated errors/contemporaneous correlations. Time series data particularly displays autocorrelated errors while heteroscedasticity is displayed by cross sectional data. Thus, conclusions drawn on the basis of standard errors that are generated through Ordinary Least Square will prove to be misleading. Many authors have suggested that theoretically, Generalized Least Square technique is superior from OLS. GLS technique can only be employed if the researcher has the understanding regarding heteroscedasticity and auto-correlation (Bell & Jones, 2015) which is somehow impractical in reality. Therefore, a suitable and practical technique is the Feasible Generalized Least Square method. In cases where T is much higher as compared to cross sectional units (N), FGLS seeks to minimize the variability of estimators, particularly for small sample size.

In order to deal with such issues, Bell and Jones (2015) suggested that the Panel Corrected Standard Errors technique should be used in case of time series cross section data, as PCSE offers robust covariance estimators. The PCSE method does not necessarily demand higher T relative to N and exhibit entity variables having strong correlation among the endogenous variable but do not exhibit any correlation with error term. It is mentioned that it is quite difficult to select suitable instruments for dealing with endogeneity by incorporating lagged values of independent variables. Lagged income growth and income were employed as instruments for the estimation of savings model. Thus, the present study used the same methodology based on the studies and income growth and per capita income are employed with one period lag for the estimation of saving models.

Furthermore, in order to resolve the problem of heteroscedasticity, White’s method is used. If both the results of
estimation for OLS and TSLS turns out to be similar, then it indicates that OLS offered unbiased and consistent estimates, and no simultaneous relationship exists among income growth/per capita income and savings, thus endogeneity is not considered to be an issue during relationship estimation among variables.

Moreover, numerous tests are conducted for choosing the suitable model from RE, FE, and OLS. One of the OLS assumption states that during a specified period of time, the cross-sectional data shows no time specific effects. Though, the existence of such effects during estimation, provide inappropriate OLS estimators for anticipating the units from the cross-sectional data over a specified time period. In addition, FE test was conducted for testing the hypothesis that no effects are present in the estimates that are generated through time series cross sectional data, followed by a Hausman test for testing whether the RE technique is consistent and suitable, and is preferred over FE estimation. Insignificant difference in estimates for both RE and FE models are found, under null hypothesis. Therefore, acceptance of Ho i.e. null hypothesis indicates that estimates of RE are correct as well as preferred over FE, on the other hand rejecting Ho shows that FE estimates are correct and preferred over RE estimates. The econometric model is discussed as below

\[ ECNG_{it} = \alpha_0 + \alpha_1 FOP_{it} + \alpha_2 INF_{it} + \alpha_3 EXCR_{it} + \alpha_4 TRADE_{it} + \alpha_5 GOVEX_{it} + \epsilon_{it} \]  

5. Results

This section highlights the results of study. The correlation matrix shown in table 1 confirms that the variables used in this study are highly correlated (Table 1).

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECNG</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FOP</td>
<td>2</td>
<td>-0.1830</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INF</td>
<td>3</td>
<td>-0.0257</td>
<td>0.1483</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EXCR</td>
<td>4</td>
<td>-0.0810</td>
<td>0.1188</td>
<td>0.8929</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>TRADE</td>
<td>5</td>
<td>0.1456</td>
<td>-0.4363</td>
<td>0.1129</td>
<td>0.0579</td>
<td>1</td>
</tr>
<tr>
<td>GOVEX</td>
<td>6</td>
<td>0.1308</td>
<td>-0.2847</td>
<td>-0.0828</td>
<td>-0.0674</td>
<td>0.0882</td>
</tr>
</tbody>
</table>

The finding in table 2 indicates that higher financial openness enhances the ECNG. This result is also consistent with the previous literatures (Law & Azman-Saini, 2013; Naveed & Mahmood, 2019). Financial openness creates higher efficiency in capital allocation which brings the improvement in the financial market and thereby increases the ECNG. Moreover, liberalized financial system would also benefits the countries by promoting venture opportunities, financial development, risk sharing, risk diversification and improves the investment activities (Marshal, 2016). The result indicates a positive but insignificant relationship between inflation and ECNG. It shows that inflation is not the factor for the ECNG in five ASEAN countries (Thailand, Singapore, Indonesia, Malaysia and Philippines) between the period of 2000 and 2014. This finding is in line with the previous study by Iqbal and Nawaz (2009). One of the possible reasons for this situation is when the increased in inflation can be predicted earlier, the financial sector and the economic players are able to adjust their financial strategies in advance and therefore the new level of inflation does not impact their performance negatively. In addition, when the inflation is expected to rise, the government would provide the necessary assistance to reduce the negative impact of the inflation in the economy. Thus, the higher inflation does not bring any negative impact to the economy when it can be predicted and prepared earlier (Table 2).
### Table 2. Regression results of model 1

<table>
<thead>
<tr>
<th>Dependent Variable: ECNG</th>
<th>Fixed Effect Coefficient (p-value)</th>
<th>Random Effect Coefficient (p-value)</th>
<th>2SLS Coefficient (p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOP</td>
<td>-0.0177*** (0.010)</td>
<td>-0.0005 (0.953)</td>
<td>-0.0089 (0.244)</td>
</tr>
<tr>
<td>INF</td>
<td>0.0198** (0.027)</td>
<td>0.0154 (0.395)</td>
<td>0.0170 (0.149)</td>
</tr>
<tr>
<td>EXCR</td>
<td>-0.0254** (0.014)</td>
<td>-0.0238 (0.228)</td>
<td>-0.0243* (0.071)</td>
</tr>
<tr>
<td>TRADE</td>
<td>0.0222 (0.176)</td>
<td>-0.0313* (0.074)</td>
<td>0.0284* (0.075)</td>
</tr>
<tr>
<td>GOVEX</td>
<td>-0.0797** (0.033)</td>
<td>-0.0488* (0.094)</td>
<td>-0.0633* (0.098)</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.740</td>
<td>0.518</td>
<td>0.616</td>
</tr>
</tbody>
</table>

The result indicates a positive and significant effect of official exchange rate on ECNG. Since this variable is measured using the official exchange rate in local currency unit, the increased in this variable indicates a depreciation in the value of local currency against 1 unit of USD. Consequently, this finding shows that a depreciation in the local currency improves the economy which is contradict with the expected finding made earlier. However, this finding is consistent with the previous studies (Habib, Mileva, & Stracca, 2017; Hausmann, Panizza, & Rigobon, 2006).

According to the studies, a depreciation in the value of the local currency would attract more foreign capital to the country and increase the investment activities. In addition, export may also increase due to the reduction in the prices of the local product abroad. These situations bring the positive impacts to the production activities and ECNG.

The result indicates that the trade has a negative and insignificant relationship with ECNG. Therefore, this study is unable to find any relationship between these two variables. This finding is also agreed by the previous studies (Musila & Yiheyis, 2015). They argue that the lacking in the structure and pattern of the trade as the factor that explains this result. For example, less scale of manufacturing activities, decline in the diversified products and also small percentage in export activities which lead to limited worldwide market access. Moreover, unsuccessful trade policy set by the government on the export and import activities could be one of the factors that lead to inconclusive relationship between trade and ECNG (Musila & Yiheyis, 2015).

The last control variable is the government expense. The regression result shows a positive and significant link between these variables which indicates that higher government expense enhances the economic development. This finding is also consistent with Olayungbo and Olayemi (2018) and Ogbuagu and Ewubare (2019). An increased in the government expenses would help the economy to grow because the expenditure in education, health and public infrastructure improve the productivity and efficiency of the workers and the business production.

### 6. Conclusion

In the last few decades, financial openness activities are widely noted around the world. Financial openness is defined as the free flows of cross-country investments which are derived from the liberalized government regulations. According to Norlida (2017) and John (2016), financial openness increases the risk sharing and risk diversification activities that would reduce the overall investment risk of the investors. In addition, the financial liberalization also enhances the efficiency in capital allocation which could improve the functions of the financial market. As noted by Nyasha and Odhiambo (2018) and Shahbazz et al. (2015), financial liberalization enhances the investment and savings activities by reducing the government controls on the investment...
and financing activities. Previous studies have identified few approaches in which the financial system is being opened to other countries. Among them are financial liberalization, capital account deregulation, relaxation in the cross-country savings and investment and deregulation in current account transactions (Cortés & Strahan, 2017). In addition, according to Marshal (2016), financial openness has increased the investment activities which lead to improvement in the economic activities.

This study has tested two research objectives that are to test the relationship between financial openness and ECNG in five ASEAN countries (Thailand, Singapore, Indonesia, Malaysia and Philippines) from year 2000 to 2014 while the second objective is to analyse the robustness of the relationship between financial openness and ECNG using FDI net inflows as the measurement for financial openness. The balanced panel data from 2000 to 2014 for five ASEAN countries (Thailand, Singapore, Indonesia, Malaysia and Philippines) has been employed in order to answer both research objectives in this study. In addition, the descriptive analysis is presented to discuss the characteristic of variables used in the regression models. The panel OLS is utilized to test the relationship between financial openness, ECNG and control variables (inflation, official exchange rate, trade and government expense). The first regression model is developed by using the KAOPEN index as the indicator for financial openness. On the other hand, for the robustness check, the FDI net inflows are employed to measure the level of the financial openness.

The first objective of this study is to examine the effect of the financial openness and ECNG for five ASEAN countries (Thailand, Singapore, Indonesia, Malaysia and Philippines) from 2000 to 2014. The finding shows that financial openness as measured by KAOPEN index enhances the ECNG. The study in line with Naveed and Mahmood (2019). Higher level of financial openness improves the capital allocation, reduces the investment risk and increases the investment and financing activities which lead to higher economic development. Next, the second objective is to test the robustness of the relationship between financial openness and ECNG that has been tested earlier by using the FDI net inflows as the indicator for financial openness. From the results, the relationship between the financial openness and ECNG is substantiated when this model concludes a positive and significant relationship between FDI net inflows and ECNG. In addition, this study also finds that two control variables which are official exchange rate and government expense improve the ECNG. This study argues that the depreciation of local currency and the government expenditure on the public developments enhance the ECNG. On the other hand, trade and inflation are not the factors for economic development with respect to five ASEAN countries (Thailand, Singapore, Indonesia, Malaysia and Philippines) between 2000 and 2014.

The findings of this study have few implications. The policy makers for the selected five ASEAN countries (Thailand, Singapore, Indonesia, Malaysia and Philippines) could utilize the information provided by this study by strengthening the strategies on developing the financial openness activities to the benefit of the economy. Furthermore, the countries could also benefit in the depreciation of the local currency by focusing on exploiting this condition for the advantage of the country. In addition, the government should focus more on public expenditure such as health, education and infrastructures because it helps the economy to grow.

There are several limitations of this study. Firstly, this study only focuses on five ASEAN countries (Thailand, Singapore, Indonesia, Malaysia and Philippines). Thus, the results are only applicable for the selected countries. Furthermore, it is recommended that the future research include a wide range of countries that consist of both developed and developing countries in order to study the relationship between the financial openness and ECNG in more detail. Secondly, this study only employs two types of financial openness measurements that are KAOPEN index and FDI net inflows. Therefore, for the future studies, comprehensive indicators of financial openness could also be utilized. Thirdly, the future research could expand the period of the study to 20 to 30 years to capture more economic events such as financial crises in the regression models. Finally, this study only uses panel OLS regression model. Future studies could extend this study by employing more sophisticated statistical methods to test the relationship between financial openness and ECNG. In addition, the short-run and long-run effects may also be employed in the study. The bidirectional relationship between financial openness and ECNG can also be investigated by the future studies.
References


DOES THE ELECTRICITY CONSUMPTION DETERMINE THE ECONOMIC GROWTH AND ENERGY PRICES IN ASEAN COUNTRIES?

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Abstract. The general objective of this study is to estimate the relationship between electricity consumption, economic performance and the price of electricity in four sectors namely the industrial, commercial, mining and agricultural by using the panel data approach on leading ASEAN countries. The present study intends to contribute significantly to the existing literature by presenting a comprehensive approach of the issue of electricity consumption in Thailand. The information of electricity consumption in the industrial, commercial, agricultural and mining sectors is essential to understand the magnitude of the sectors’ sensitivity to change with respect to GDP and electricity price. Moreover, real electricity price is incorporated in this study to provide a more consistent result. The findings are important for researchers and academicians by providing a better knowledge of sectoral electricity demand to permit better regulatory decisions in order to facilitate economic efficiency. Apparently for the policy makers, it will be possible that the approach of this study could be useful as a guideline to facilitate the adoption of a more appropriate model for electricity demand management as well as restructuring the electricity sectors. Furthermore, the findings of this study will be helpful in the formulation of effective energy and pricing policies in order to encourage consumers towards the efficient use of energy for the future of sustainable energy and development.

Keywords: electricity consumption; economic growth; energy prices


JEL Classifications: F23, K32

1. Introduction

Electricity is a man-made source of energy. As it is non-durable, electricity compliments durable goods like electrical appliances or electrical machinery (Mohd Hafiz Aswad, 2015; Vlasov & Kiseleva, 2017). It helps directly by running consumer durables in terms of services and running machines which help directly or indirectly to produce consumer goods. Electricity is an exceptional energy because the consumption of electricity has to be simultaneous once it is been generated, thus electricity cannot be economically stored. Furthermore, electricity has a unique position among other different types of energy because electricity is clean energy, is easy to transfer and can be transformed into other kinds of energy. The demand of electricity varies hourly, daily, weekly and across the seasons and industries and societies and is determined by wide arrow of factors (Strielkowski et al., 2017; Tvaronavičienė et al., 2017; Melas, et al., 2017; Supian & Ab, 2018; Kuiken & Más, 2019; Todorov et al., 2019; Dudin et al., 2019; Vlasov et al. 2019; Smaliukienė, Monni, 2019; Rezk et al., 2018;
It cannot be fully controlled, and it is practically impossible to prevent market participants from consuming more or less electricity.

Electricity plays an important role in the process of economic growth and is required for both commercial and non-commercial usage. Commercial usage of electricity refers to the use of electric power in the industrial, commercial, mining and agricultural sectors. For non-commercial, the principal use of electricity energy is for public lighting and by residential consumer. Feron (2016) stated that electricity is indispensable to industrial and commercial establishments, meaning that a lack of energy causes difficulties and economic losses due to the reduction in production (Panos, Densing, & Volkart, 2016). Moreover, an increase in the production of goods and services will consume a lot of electricity. Therefore, the demand for electricity is driven by such important factors as industrial development, population growth, urbanization and the rising standard of living. This is why electricity has become the principal type of energy source to improve the socioeconomic condition in countries (Widiastuti, et al., 2017; Buyinza & Kapeller, 2018).

The increasing trend of electricity consumption (ECN) and its relationship with the growing economy has come to the special attention of policy makers. In Thailand, electricity demand (ELCD) is mostly met with the use of insufficient and expensive fuel resources such as natural gas and coal which continues to expand rapidly. At the same time, it is the government’s responsibility to supply a sustainable and economical price of electricity to consumers. However, the lack of sufficient generation to meet the increasing demand for electricity in the country will lead to undesired political, social and economic effects. Therefore, an understanding of consumers’ demand behavior on electricity is important in order to have an accurate planning for the sufficient supply of electricity commensurate with this demand. Furthermore, it is vital to have comprehensive knowledge of factors that influence ECN. This information could be useful for policy makers to come out with better energy policies and strategies to minimize the socioeconomic effects such as their impact on firms, households, and consequently, social welfare.

<table>
<thead>
<tr>
<th>Production Effect</th>
<th>Structural Effect</th>
<th>Intensity Effect</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brunei</td>
<td>Cambodia</td>
<td>Indonesia</td>
<td>Lao PDR</td>
</tr>
<tr>
<td>1.6</td>
<td>6.4</td>
<td>190.2</td>
<td>3.3</td>
</tr>
<tr>
<td>0.8</td>
<td>-6.1</td>
<td>0.7</td>
<td>3.4</td>
</tr>
<tr>
<td>-5.7</td>
<td>-100.0</td>
<td>12.6</td>
<td>-21.6</td>
</tr>
<tr>
<td>-35.5</td>
<td>-25.6</td>
<td>-5.3</td>
<td>-14.4</td>
</tr>
<tr>
<td>1.3</td>
<td>37.6</td>
<td>7.4</td>
<td>14.4</td>
</tr>
<tr>
<td>39.6</td>
<td>260.7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: World Bank
The demand for electricity in Thailand is primarily for the industrial, commercial, residential, public lighting, mining and agricultural sectors. The factors that derive ELCD differ across the economic sectors. For instance, the industrial and commercial sectors consume electricity as an input of production and their objective is to minimize the cost of production. Residential consumers’ demand for electricity relies on consumers’ utility maximization by allocating income so that they obtain great satisfaction from total expenditure. The industrial sector is the main electricity consumer, accounting for more than 40 percent of total ECN in Thailand. The commercial sector is the second largest electricity consumer at just below 35 percent, followed by the residential sector at around 20 percent. By comparison, other sectors such as public lighting, and the agricultural and mining sectors made up less than two percent of total ECN. To investigate the behaviour of electricity consumers among the sectors, this study will emphasize the commercial usage of electricity referring to the four key sectors in Thailand’s economy, namely the industrial, commercial, mining and agricultural sectors. These sectors contribute significantly to the development of Thailand’s economy in terms of GDP and use electricity energy as an input to produce goods and services. Meanwhile, other sectors such as residential and public lighting are not considered in this analysis because these sectors consume electricity for non-commercial purposes and do not contribute to the country’s GDP.

The industrial sector can be defined as a consumer engaging in the manufacturing of goods and products. The industrial sector represents both the manufacturing and construction sectors. The chemical, base metal, paper, wood, non-metal and food industries are the most energy-intensive users in the industrial sector (Diawuo, Baptista, & Silva, 2018). Overall energy use in this sector is largely for processing heat, cooling and powering machinery. It is found that the industrial sector has the largest share of electricity usage in overall ECN but its share slowly reduce from 51 percent to 43 percent between the period 2002 and 2012. It can be observed that in the future, electricity consumed by the industrial sector will not only decrease but could also diminish. The reason could be from the energy efficiency measures that were implemented by industrial consumers, which managed to reduce the energy demand (National Energy Balance, 2012). Meanwhile, industrial ECN has recorded a 6.9 percent growth from 2002 to 2012. One of the main reasons for the higher growth was due to the performance of the GDP growth rate in the construction sector that is driven mostly by energy intensive industries (National Energy Balance, 2012).

In order to understand the efficiency of electricity usage relatively to the performance of the economy, this study uses the term energy intensity as a measurement for the quantity of energy required per unit of economic output or GDP. The industrial sector recorded the highest electricity intensity compared to other sectors in the economy. Industrial electricity intensity slowly decreased by 8.4 percent from 2005 to 2012. The commercial sector is defined as a consumer occupying or operating in the buildings used by businesses or wide range of facilities such as government buildings, religious organizations and any other forms of businesses or commercial activities which are Industrial Commercial Mining Agricultural not primarily involved in manufacturing, quarrying or mining activities. According to the total number of electricity consumers, the commercial sector is the second largest consumers after the residential sector, accounting for 1.5 million or 17 percent of the total electricity consumers in 2012.

The mining sector can be defined as a consumer using most part of the electricity for extracting minerals and dredging activities for crude oil, natural gas and tin. This sector contributed the lowest share of total ECN at 0.1 percent. The electricity consumed by the mining sector declined from 2002 until 2008, but then it slowly increased beginning in 2010. Moreover, the mining sector’s contribution to GDP growth also started to decline within the same period due to lower production of crude oil ans mining sector’s electricity intensity pattern displayed at almost a constant trend between 0.17 GWh and 0.15 GWh from 2002 until 2012.

The agricultural sector is a consumer conducting specific agricultural activities strictly related to agricultural cultivation and breeding. Electricity used in the agricultural sector is used mainly to operate machinery and equipment, heating or cooling green houses, lighting in the farms, water pumping for the irrigation of land and controlling water gates for the production of grains. In comparison to other sectors in the economy, the agricultural sector has become increasingly dependent on energy resources. This sector was relying more on petrol
and the coal industry output as its input compared to electricity and natural gas (Commander, Nikoloski, & Vagliasindi, 2015; Swenson, 2016). It is observed that the agricultural sector only contributes a smaller share of the total ECN, accounting for less than 0.5 percent. As depicted in electricity consumed by the agricultural sector increased from one GWh to 344 GWh from 2002 until 2012. The growth in ECN is in line with the GDP growth rate in the agricultural sector during the same period. As a result, agricultural electricity intensity has gradually increased from 2002 to 2012 reaching at 0.63 GWh.

Hence, this study aims to shed light on the modelling ECN, namely the industrial, commercial, mining and agricultural sectors to present empirical evidence on the elasticity and causality in Thailand. To provide a reliable sectoral ECN model, the above-mentioned variables such as sectoral GDP and real electricity price will be applied. The key contribution of this study is to provide some information on the responsiveness of ECN toward the changes in economic performance and electricity price in sectoral level. Another contribution is to investigate any potential causal relationship between ECN with economic performance and electricity price where the results would be useful for a recommendation of energy policies.

The general objective of this study is to estimate the relationship between ECN, economic performance and the price of electricity in four sectors namely the industrial, commercial, mining and agricultural by using the panel data approach. The present study intends to contribute significantly to the existing literature by presenting a comprehensive approach of the issue of ECN in Thailand. The information of ECN in the industrial, commercial, agricultural and mining sectors is essential to understand the magnitude of the sectors’ sensitivity to change with respect to GDP and electricity price. Moreover, real electricity price is incorporated in this study to provide a more consistent result. The findings are important for researchers and academicians by providing a better knowledge of sectoral ELCD to permit better regulatory decisions in order to facilitate economic efficiency. Apparently for the policy makers, it will be possible that the approach of this study could be useful as a guideline to facilitate the adoption of a more appropriate model for ELCD management as well as restructuring the electricity sectors. Furthermore, the findings of this study will be helpful in the formulation of effective energy and pricing policies in order to encourage consumers towards the efficient use of energy for the future of sustainable energy and development.

2. Theoretical Review

Electricity can be referred to as derived demand because electricity is a function of the types of electrical appliances that exist in a particular type of dwelling or building. In this context, electricity is derived along with other inputs for a factor of production resulting from the demand of other intermediate goods or services. Inglesi-Lotz (2019) stated that there were two approaches in dealing with ECN based on the economic perspective. The first approach was from the supply side where electrical energy is used as an input for the production output of the sector. However, the results from the regression analysis were found to be insignificant and it was concluded that ECN was not an appropriate factor to explain the output trends of the sectors. The second approach was from the demand side where consumers used electrical energy as a result of the output and prices. Based on this approach, it was suggested that ECN from the demand side was appropriate in analyzing the ECN model. This means that consumers’ ECN was a function of electricity price and the total output produced in each sector.

The rationale of behaviour of consumers on the demand of electricity is based on different theoretical foundations. A small number of theories have been proposed to explain the diverse cause of ELCD in order to have a better understanding of the factors that influence the demand for electricity. Although the articles, such as Cialani and Mortazavi (2018) and Bajjali and Shamayleh (2018) cover a variety of theories, this review will focus on the seven most important factors that influence the demand for electricity, which emerge repeatedly throughout the literature reviewed. These factors are price of electricity, income or GDP, price of substitute energy, population, weather, stock of electrical appliances and the number of consumers. To achieve the objective, this study will primarily focus on the application of price of electricity and GDP.
Here it has to be noted that oil prices affect various facets of economics, not only demand for energy (Masood et al., 2019; Humbatova et al., 2019).

The consumption of energy is mainly determined by its own price. Caldara, Cavallo, and Iacoviello (2019), in his study on crude oil demand, has claimed that the price elasticity of demand for energy was important for policy makers to monitor the quantity of energy demand. He suggested that the price of elasticity was very low in the long and short run that was derived from a variety of econometric procedures and covered different periods. Meanwhile, Foster, Wagner, and Liebman (2015) analyzed the price elasticity of natural gas and they argued that the fluctuation in natural gas price had a significant effect on consumers’ change in their fuel demand. On behalf of ECN, the price of electricity or electrical tariff is commonly used to determine the quantity of electricity usage. According to the law of demand, the price of electricity is assumed to have an inverse relationship to the quantity demanded for electricity. Therefore, in the function of ECN, electricity price plays an important component due to its greater influence on affecting the quantity of electricity consumed. The majority of the articles on ECN analysis such as Polemis (2016) and Labandeira, Labeaga, and López-Otero (2017), concluded that a higher electricity price would cause a substantial reduction in overall ECN, while a falling in electricity price would increase the usage of electricity, ceteris paribus. For instance, when the price of electricity increases, it increases the total cost of production. In order to lessen the cost of production, a firm will reduce the purchase of electricity energy. As a result, the firm’s demand for electricity will decrease.

Recent study outlined, who focused on commercial and industrial water demand, argued that the demand for energy did not only depend on the price of energy, but was also influenced by the sector performances. In general, the majority of economic articles on ECN such as Bajjali and Shamayleh (2018) and Javid and Qayyum (2014); Wonyra, (2018) have considered the relationship between electricity and the economic performance or income based on GDP. In particular, as economic development progresses, consumption and production patterns will change, thus resulting in changes in energy use patterns. Most articles on ELCD, such as Bajjali and Shamayleh (2018), have observed that an increase in GDP will lead to an increase in ELCD. For instance, an increase in GDP will raise consumer wealth, thus consumers get an extra income to spend. Thereby, it raises more consumption for the quantity of goods and services. These structural changes in consumption result in changes in production. In other words, when the demand for goods increases, firms will raise the production and this will promote changes in ECN. This means that more additional electricity is required in order to produce more output.

According to the sectoral or firm perspective, electricity is an essential input for the production process of goods and services, similar to labour and capital. As explained by Debnath and Moursheh (2018), in order to produce a unit of product, a firm needs an input factor in the form of electricity. Thus, ELCD adds to the production function. Generally, the objective of the firm is to maximize profit or to minimize cost for a given level of outputs. For instance, the profit maximizing firm will choose both input and output with the sole goal of maximizing economic profits that refer to the difference between total revenue and total cost. Several studies on industrial ELCD, such as Zafarullah, (2018); Krutsyak (2019) and Tishler (1983), applied the producer of profit maximization theory.

In comparison, cost minimization is an alternative way considering the behaviour of a profit maximizing firm that takes factor prices as given but can influence output prices. According to Medlock III, a firm purchases energy as an input to the production of its output and naturally attempts to do it in accordance with cost minimization. Another study by Ali (2016) used the cost minimization model on ECN function. In this model, the authors considered production as a function of energy services, including the service of electricity and other kinds of energy as well as the service of other production factors such as labour and capital. Furthermore, electricity service was considered as a function of ECN and the quality of electricity supply. The production cost subject to the production function constraint was minimized and ECN of an individual firm was introduced as a function of the electricity supply quality, electricity price, price of substitute energy and the firm’s value added. Recently, Mohd Hafiz Aswad (2015) analyzed the demand behaviour of ECN in different sectors in Iran. Based on the article by Sani, Mukhtar, and Gani (2017), he described the concept of cost minimization of production.
cost was subject to the production function constraint. In his study, he claimed that the production by the industrial and agricultural sectors was considered to be a function of ELCD for an input together with other inputs in the production process (Maree, 2017; Margaret & Donna, 2017). As a result, the basis of the quantity of ECN was derived as a function of output of the industry, the price of electricity, the price of substitute fuel, labour and other exogenous factors. In addition, the author also included the stock of electrical appliances and technological progress as proxied by fixed capital to investigate the impact on the level of sectors. In other studies, some researchers, such as Hassan (2018), have also considered the cost minimization theory in their ECN modelling.

The study on consumers’ behaviour on ECN is importantly needed in order to understand the causes that determine the change in the consumption of electricity. The importance of this study hinges on exploring two main factors such as economic performance and electricity price elasticity. This illustrates some information as how ECN changes due to the impact of economic performance and electricity price. Furthermore, there is also a causal relationship between ECN, economic performance and electricity price.

2.1. Relationship between ECN and Economic Performance

Generally, GDP is the most commonly used variable as an indicator for measuring economic growth or national income in determining ECN of the respective country. However, other ELCD studies that specifically focus on sectoral levels also employed GDP as an indicator to represent the sector income or economic performance. For the purpose of this review, the terms of income, economic performance or economic growth are used interchangeably with GDP in order to explain its relationship with ECN. In theory, the demand for normal goods should increase proportionately when there is an increase in income. As for energy, the measurement of income effects on consumption is important because energy bills often represent a lower proportion of income for higher income consumers (Null, 2018). In energy literature, the estimation of income elasticity for ECN began with the study by Su (2019) in the United Kingdom (UK). He was concerned with the response of consumers towards changes in income. The results revealed the stability in his ELCD function and it indicated that ELCD in the UK was sensitive to changes in economic performance. Following his introductory study, research efforts on the estimation of income elasticity have become extensive and have raised the attention of analysts and researchers. For instance, several articles (Boogen, Datta, & Filippini, 2017; Mensah, Marbuah, & Amoah, 2016) used national income to estimate the ECN in their respective countries. Based on their investigations, the estimation of income elasticity was universally significant and indicated a positive sign towards the change in ECN. However, the level of income elasticity showed varying outcomes. Boogen et al. (2017) measured the determinants of Greek ECN from 1961 to 1986. They found that the income elasticity was elastic at 1.56. In the same Omololuabi, Mesagan, and Oladipupo (2016) found similar findings of ELCD in the Gulf Cooperation Council (GCC) member states. The outcomes indicated that the long run elasticity of income between GCC countries was very elastic, and varied from 1.65 to 5.39. Moreover, Dai and Gao (2016) also found consistent results for ELCD in Sri Lanka covering the period from 1970 to 2003. The income elasticity had a range of between 1.00 and 1.96.

Several researchers discovered that ECN was actually less sensitive to changes in income in the long run (Haseeb et al., 2019). Akarsu (2017) examined the influence of GDP on ECN in South Africa over the period from 1950 to 1983. He revealed that the income elasticity was inelastic as estimated at 0.71. In another study, R. Inglesi-Lotz and Pouris (2016) also found consistent results regarding the inelasticity of income. Based on per capita studies over the period from 1978 to 2005, he concluded that ECN of South Africa was driven by GDP as estimated at 0.31. Meanwhile, studied ELCD of the United States and they concluded that the income elasticity was close to 0.5. Moreover, a study on the effect of GDP on ELCD in Namibia from 1960 to 2002. In this study, they reached the same conclusion that ECN was actually driven by income, where the elasticity was found to be inelastic at 0.59.

Recently, Atalla and Hunt (2016) tried to investigate ECN in Turkey as a function of GDP. Atalla and Hunt (2016) estimated the income elasticity over the period from 1960 until 2008. The findings indicated that ECN tended to be very inelastic due to the change in income as calculated to be 0.17. The results, reflecting the na-
ture of the demand for electricity was similar to those reported. The authors used different time periods from 1970 to 2009 and the estimation of income elasticity was found to be 0.92. By making the comparison, it can be concluded that ECN in Turkey was less responsive to changes in GDP. Based on the findings from previous articles, there were similarities between the positive responses of ECN and the changes in income in the long run. However, the results also indicated that ECN had shown different sensitivities to income changes in their respective countries. For example, Atalla and Hunt (2016) found that the income elasticity was lower than unity in the long run, whereas the study of Boogen et al. (2017) presented that income elasticity ranged from 1.56 to 5.39. This suggested that ELCD was responsive to variations in income in the long run. Income level, often used as a proxy for GDP was the most important determinant of ELCD.

2.2 Relationship between ECN and Electricity Price

In theory, electricity price elasticity can be measured by unit changes in ECN with respect to unit changes in electricity price. However, there was a wide variation in the electricity price specifications reported in the literature. For instance, classical studies on electricity price elasticity such as categorized the related works by residential and industry between 1946 and 1957. For ELCD function, average revenue was used to represent electricity price. It was found that electricity price had little effect on long run ELCD. The price elasticity was ranged from -0.22 to -0.99. In another study, author used the same average revenue to address ELCD in the United States (US), incorporating the use of pooled data of 48 states from 1961 to 1969. He concluded that ELCD was responsive to change in electricity price as calculated from -1.09 to -1.14. Within the same country, employed typical bills based on 500 kilowatt hours per month to represent electricity price in their cross section studies in 77 cities and 50 states. Both authors came up with the findings that electricity price elasticity ranged from -0.84 to -1.33.

Recent studies by Ngondya (2018) and Ivy-Yap and Bekhet (2014) estimated the demand for electricity focused in developing countries. For instance, Ngondya (2018) studied the ECN in 32 developing countries from the 1999 until 2004 period. He employed price of oil as a proxy for the price of electricity due to difficulties to get data information. He argued that electricity price was actually dependent on oil price and indicated that electricity price would increase when there was an increase in oil price. Therefore, the estimation coefficient of electricity price elasticity in developing countries was found to be inelastic at -0.036. However, the result was found to be biased because the price of oil could not explain the level of ECN more precisely to measure consumers’ response to a change in price. Therefore, Ngondya (2018) suggested that the application of real electricity price would provide more accurate and appropriate results. In another study, employed the real electricity price to estimate the ELCD in India over the period from 1959 to 1995. As a result, they found that the price elasticity in the long run was inelastic, as estimated at -0.16. Recently, used electricity price per capita to measure ECN between 1979 and 2008. However, the model suggested that the price elasticity was found to be insignificant to explain the electricity usage in Thailand.

In Thailand, academic studies about ECN are rare, with Ivy-Yap and Bekhet (2014) being among the main contributors. Scholar examined rural and urban ECN using annual data from 1980 until 2009. In these studies, they employed the CPI as a proxy for electricity price. The results showed that the electricity price elasticity was found to be insignificant as estimated at 0.59. This means that the price of electricity failed to explain the ELCD both in rural and urban areas. In the same vein, Ivy-Yap and Bekhet (2014) examined the residential ECN from 1978 to 2011. Similar, they used the CPI as a proxy for electricity price. The results were also found to be insignificant where the price elasticity was estimated at -0.13. However, both findings were inaccurate because the CPI was used as a proxy for electricity price which could lead the results to be insignificant. According to Author, one of the main issues associated with the CPI was that it was actually a fixed quantity price index based on sample prices rather than relative quantities purchased by consumers. In another study, Gillingham, Rapson, and Wagner (2016) estimated the short and long run ELCD in Sri Lanka based on annual data from 1960 to 2007. In the study, they employed an average price of electricity as one of the main determinants. The long run and short run price elasticities were found to be inelastic as estimated at -0.62 and -0.16 respectively. Moreover, also applied the same price specification to explain the ECN in South Africa covering the period from 1980 to
2005. The result indicated that ELCD was less responsive to changes in electricity price in the long run as estimated to be at -0.56. According to Acuña (2017), the average electricity price was the right indication and was statistically significant. They suggested that the average electricity price should be used in the ELCD function.

For causality analysis, very small number of studies such as Gillingham et al. (2016) investigated the relationship between energy and ECN together with its own price. For instance, author investigated the relationship between energy consumption and energy prices in four Asian countries. He discovered that there was a significant long run relationship running from energy price to energy consumption in Indonesia and Thailand, but no relationship was discovered in India and the Philippines. Meanwhile, Gillingham et al. (2016) found bidirectional causality between ECN and electricity price in Sri Lanka. In Thailand, Tasnim and Amin (2018) discovered unidirectional causality running from ECN to electricity price. They claimed that an increase in the consumption of electricity would cause inflation which would lead to a reduction in consumer purchasing power.

Based on the above reviews, all estimated electricity price parameters have the expected sign. The majority of the studies, such as Gillingham et al. (2016), concluded that electricity price had a negative relationship with ECN in the long run. However, the estimated price elasticity lay within a wide range of between – 1.33 and –0.036. On the other hand, there were mixed results in terms of causality relationship between energy, electricity and its own price.

2.3. Relationship between ECN and Other Variables

The demand for electricity commodity is not always explained by its own price and income, but it is also influenced by other potential factors that significantly affect ECN. These factors could be from the population, number of customers, electrical appliances, substitute price of energy and weather depending on the nature of the electricity commodity. Recently, empirical studies, such as Bajjali and Shamayleh (2018) Tasnim and Amin (2018) had considered other different explanatory variables to explain the aggregate level and sectoral ECN. For instance, scholar considered population as a determinant of ECN in Thailand. The results of the study revealed the positive elasticity in population as estimated at 0.89. This implied that a higher population would constitute a major driver for ELCD in Thailand. In another study, Tasnim and Amin (2018) discovered the positive relationship between population and ECN especially in urban areas. The urban population indicated more sense in terms of ECN rather than the rural population as estimated at 1.08 and 0.2 respectively. They claimed that the increase in the consumption of electricity by the urban population was due to higher exposure to stocks of electrical appliances and electrical transportation. Meanwhile, Kaboli, Fallahpour, Kazemi, Selvaraj, and Rahim (2016) analyzed employment in modelling the industrial ELCD. According to Kaboli et al. (2016), employment referred to the number of employees that required additional ECN, such as the demand for space lightning, air conditioning and heating. The result showed that employment was found to be insignificant to explain industrial ELCD in Jordan. In Thailand, researcher argued that employment would have an effect on the rate of purchase of electrical appliances which increased ECN. The results showed that a unit change in employment level increased the consumption of electricity as calculated at 0.025.

Furthermore, several studies, incorporated the number of consumers as one of the explanatory variables. For instance, Boogen et al. (2017) studied ECN in Greece covering the period from 1961 to 1986. During the investigation period, it was found that the coefficient of the number of electricity consumers was significant and played a very important role in the expansion of electricity usage in Greece. Author also confirmed that the number of electricity consumers was a proper determinant and showed a strong predictive in modelling the annual ECN in Northern Cyprus. In Iran, scholar found that the elasticity for the number of electricity consumers in industrial and agricultural sectors showed a positive sign as estimated at 0.24 to 1.2 respectively.

In another study, Tyagi & Siddiqui, (2017); Bajjali and Shamayleh (2018) employed the number of electricity consumers to represent the quantity of firms that used electricity for the derivation of utility. The results of elasticity were found to be mixed. In the aggregate level and the commercial sector, the number of customers
showed a positive sign as estimated at 0.07 and 0.62 respectively. Meanwhile, in the industrial and agricultural sectors, the number of consumers showed an opposite sign as both were estimated to be -1.71 and -0.93 respectively. This implied that electricity usage would increase in the aggregate level and the commercial sector but it would reduce in the industrial and agricultural sectors due to an increase in the number of consumers. In the same scholar found evidence that the number of electricity consumers had a significant impact on the sectoral ELCD in Pakistan from the period 1970 to 2006. The number of electricity consumers in the industrial and agricultural sectors indicated a positive sign as estimated at 2.42 and 2.21 respectively. However, none of the energy studies in Thailand have investigated the impact of consumers either on the aggregate level and sectoral ECN.

Furthermore, a small number of studies, such as Bajjali and Shamayleh (2018), applied electrical appliances in their ECN modelling. According to Bajjali and Shamayleh (2018), it was argued that the stock of electrical appliances was an important influencing factor to be considered in ECN model. For used urbanization as a proxy to capture the effects of technological changes in the stock of electrical appliances. The results showed that urbanization was an important variable in the long run, where elasticity was estimated at 3.91. Meanwhile, Bajjali and Shamayleh (2018) employed the value of imported electrical goods as a proxy for electrical appliances. This variable was used to investigate the usage of electrical goods and capital stock between the economic sectors in Pakistan. Thus, the results of electrical appliance elasticity was found to be significant and showed a positive sign in all sectors ranging from 0.23 to 1.69. This indicated that an increase in the usage of electrical appliances would further increase the consumption of electricity.

In Iran, used fixed capital as a proxy for the stock of electrical appliances of the commercial sector and for the technology of the industrial and agricultural machinery. The author claimed that fixed capital was considered to explain the total investment of buildings and machinery in the commercial, industrial, public and agricultural sectors. Thus, it required the provision of more electrical appliances and equipment. The reason for such a relationship was that higher fixed capital in the form of appliances and machinery represented increasing investments in new electrical appliances and machinery. However, fixed capital was found to be insignificant to explain sectoral ELCD. In Thailand, none of the studies have tested the influence of the stock of electrical appliances on sectoral ELCD.

Other studies, such as Tasnim and Amin (2018) also considered different forms of energy or fuel as an alternative to electricity. This assumed that natural gas, oil, and diesel could be used as substitute forms of energy to electricity. However, this was not easily validated because electricity has unique characteristics. According to Akarsu (2017), electricity was the cleanest of all fuels and it was versatile and easily transferable. Thus, it was impossible or difficult for other fossil fuel processes to compete. For instance, employed natural gas as a substitute form of energy for ECN in Australia. It was found that natural gas was not a perfect substitute for electricity. Similarly, Tasnim and Amin (2018) found that natural gas price elasticity was insignificant to explain the ECN in rural and urban areas in Thailand. Moreover, author suggested that electricity was not a perfect substitute for other forms of energy during his study on the aggregate level and the sectoral ELCD in Pakistan. Pourazarm (2012) also found that substitute forms of energy, such as diesel, gas and fuel oil, had no substitution relationship with sectoral ELCD. These results highlighted that the elasticity of substitute energy was either inelastic or insignificant. Therefore, it can be concluded that the substitute price of energy is not appropriate to explain ECN.

2.4. Theoretical Framework

Theoretically, the demand for electricity is derived demand that comes from the demand for lighting, heating, cooling and others. In the study by Pourazarm (2012), ELCD by the different sectors, such as the industrial and agricultural sectors are modelled as the outcome of a cost minimization theory that is used by a firm in the production process. As a result, production by these sectors is considered to be a function of ELCD input and demand input of labour, capital and other inputs. Following the work by Pourazarm (2012), the behavioural equation of a firm’s ELCD function is constructed from the production function as follows:
\[ Y = (E_D, E_S, L, Q) \] ...(1)

Where \( Y \) is the level of output and \( E_D \), \( E_S \), \( L \), and \( Q \) are the quantity of electricity, being substitute energy, labour and capital respectively. Minimization of production cost subject to the constraint of the production function presents the ELCD of the firm \( (E_D) \) as follows:


where \( EP_s, EP_y, EP_l \) and \( EP_k \) are the price of electricity, being the substitute fuel, labour and capital respectively. For consumers, the power demand is the sum of the ECN of all firms in the industry:

where is the ELCD of the industry. Therefore


where \( Y_e \) is the total output and \( EP_s, EP_y, EP_l \) and \( EP_k \) are the average price of \( EP_s, EP_y, EP_l \) and \( EP_k \) respectively for the whole industry. Let the functional form of demand assume constant elasticity, then:

\[ Y_e = f(Y, EP_s^\alpha, EP_y^\beta, EP_l^\gamma, EP_k^\rho) \] ...(4)

By taking the log transformation from both sides of Equation (4), the ELCD function can be given by:

\[ y_e = f(\vartheta + \alpha_e + \beta_s + \gamma_l + \rho_s) \] ...(5)

where the lowercase letters display the log value of the variables. As shown in Equation (5), the parameters \( \alpha_s, \beta_s, \gamma_l, \) and \( \rho_s \) are estimates of the elasticity. Based on the theoretical and empirical reviews, this study considers representing income or output. Meanwhile, \( \alpha_e \) represents the price of electricity, \( \beta_s \) indicates the price of substitute fuel, \( \gamma_l \) indicates the price of labour, and \( \rho_s \) represents the price of capital. Note that the price of substitute energy is not included in this study since it does not significantly explain ELCD according to Bekhet and Othman (2011) and Jamil and Ahmad (2011). Moreover, due to the lack of data for, total employment will be considered in this series.

Therefore, this study will pool cross-section and time series data to examine the relationship between ECN, GDP, the price of electricity, the number of electricity consumers, employment and capital investment. The function of ECN can be written in the following equation:

\[ ECN = f(GDP + PRE + NOCNS + EMPL + CIN) \] ...(6)

Based on the ECN functions, the econometrical can be finally specified model as follows:

\[ ECN_{it} = \alpha_0 + \alpha_1 GDP_{it} + \alpha_2 PRE_{it} + \alpha_3 NOCNS_{it} + \alpha_4 EMPL_{it} + \alpha_5 CIN_{it} \] ...(7)

3. Data and Method

Secondary data are utilized in this study based on a balance panel consisting of the annual data for 11 years, from the period of 2007 until 2018. The data are gathered and verified from various sources. After the panel series are found to be integrated at the same order at first difference, the next step is to test whether EC and the independent variables are cointegrated or whether there is the existence of stable long term relationship. Hence, the sectoral ELCD relationship will be examined using the panel cointegration approach suggested by Pedroni (1999). This procedure allows consistent and efficient estimation of the parameters in relatively small
samples and also control for potential endogeneity of the regressors and serial correlation. In this study, panel cointegration tests proposed by Pedroni (1999) will be applied since he determines the suitability of the tests to be used in calculating the residuals from a cointegration regression after normalizing the panel statistics with correction terms.

Once the explanatory variables are cointegrated in the long run, then the model is estimated by adopting panel FMOLS techniques developed by Pedroni (1999). The purpose of FMOLS is to obtain long run cointegration relationship of the sectoral ECN model. This technique is used for estimating the cointegration vector in the dynamic panel data that allows considerable heterogeneity across individual sectors of the panel. The advantage of using this technique is that the group means estimator is behaving reasonably well even in a relatively small sample under a variety of scenarios Pedroni (1999).

### 4. Results

Correlation analysis is used to determine the direction and strength of the relationship between ECN with GDP, price of electricity, number of electricity consumers, employment and capital investment. As illustrated in Table 1, the results show that all variables, except the price of electricity, have a positive relationship with ECN. Moreover, GDP and the number of electricity consumers indicate the strongest relationship with ECN.

**Table 1. Correlation Analysis**

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECN</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GDP</td>
<td>0.15</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRE</td>
<td>0.20</td>
<td>0.13</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NOCSN</td>
<td>0.26</td>
<td>-0.13</td>
<td>0.41</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EMP</td>
<td>0.03</td>
<td>-0.12</td>
<td>0.43</td>
<td>0.03</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>CIN</td>
<td>0.311</td>
<td>0.03</td>
<td>-0.23</td>
<td>0.31</td>
<td>0.13</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Econometric theory requires that all variables must be stationary conditions before performing cointegration tests. If non-stationary variables are used in the regression, the results will be misleading because of spurious regression. Therefore, it is a preliminary condition to test for unit root before proceeding to other econometric analysis. In this study, the LLC test was employed to perform the panel unit root test. This test was performed on both levels and at first difference for all variables.

**Table 1. Panel Cointegration test Results**

<table>
<thead>
<tr>
<th>Test</th>
<th>Constant</th>
<th>Constant=Trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panel v-Statistics</td>
<td>-1.926</td>
<td>-2.8731</td>
</tr>
<tr>
<td>Panel $\rho$ -Statistics</td>
<td>0.07231</td>
<td>0.7632</td>
</tr>
<tr>
<td>Panel $\xi$ -Statistics (non-parametric)</td>
<td>-5.4322***</td>
<td>-8.843***</td>
</tr>
<tr>
<td>Panel $\xi$ -Statistics (parametric)</td>
<td>-6.3207***</td>
<td>-6.674***</td>
</tr>
<tr>
<td>Group $\rho$ -Statistics</td>
<td>3.212</td>
<td>4.423</td>
</tr>
<tr>
<td>Group $\xi$ -Statistics (non-parametric)</td>
<td>-7.762***</td>
<td>-9.262***</td>
</tr>
<tr>
<td>Group $\xi$ -Statistics (parametric)</td>
<td>-3.877***</td>
<td>-4.324***</td>
</tr>
</tbody>
</table>
This section reports the results of the panel cointegration test based on Pedroni (1999). The residuals of the Pedroni cointegration test allow the ECN model to be determined whether there is an existence of the long run relationship among the variables that are not stationary. The procedure of the Pedroni cointegration test involves seven different test statistics, as discussed in previous section. If these statistic values are found to be statistically significant, this suggests that the null hypothesis of no cointegration can be rejected. Therefore, there is a presence of a cointegrating relationship among the variables in the ECN model. As illustrated in Table 2, the panel cointegration test contains the results of the panel statistics and the group statistics. In the panel statistics, if there is a common statistical value within the dimension, the model should be cointegrated. The null hypothesis stated that there is no common statistical value within the dimension, which also means that there is no cointegration in the ECN model. In the group statistics, the alternative hypothesis suggests that there is a significant individual statistical value between the sectors.

5. Conclusion

The price of electricity (PE) elasticity has mixed results throughout the sectors. For instance, the results of electricity price elasticity in the industrial and commercial sectors are significant at the five percent level but both sectors indicate a different sign. In the commercial sector, a one percent increase in electricity price causes a reduction in ECN by 0.39 percent. The negative sign in electricity price affirms the theory that price has an inverse relationship to consumption. The coefficient of electricity price elasticity is inelastic, which means that the commercial sector ECN is less responsive with respect to electricity price changes. Generally, electrical energy in the commercial sector is used for cooling and lighting where the lifetime of electrical appliances is relatively long. This implies a low response to electricity price changes. The result is consistent with the findings by Alter and Syed (2011) and Javid and Qayyum (2014) where they found price elasticity to be between the range of -1.83 to -0.26.

In contrast, the electricity price elasticity in the industrial sector shows a positive sign. This indicates that a one percent increase in electricity price will increase the industrial sector’s ECN by 0.37 percent. The result contradicts with the theory of demand law which explains that the price should have an opposite relationship to the quantity demanded. This suggests that increases in electricity tariff will give no impact on the industrial sector to reduce production; instead they continue to purchase electrical energy as a main input to run machinery operations as well as for cooling, heating and lighting in the production processes. This could be explained by the fact that the industrial sector enjoys the lowest electricity tariff as compared to other sectors in the economy due to high fuel subsidies by the government. The results are consistent only with the findings by Javid and Qayyum (2014). Moreover, electricity price elasticity in the mining and agricultural sectors is found to be insignificant.

The results of the number of electricity consumers (CONS) are statistically significant in the long run for all sectors. The sign of consumer elasticity in the commercial sector is elastic as estimated at 1.17, but the mining and agricultural sectors are found to be inelastic as estimated at 0.86 and 0.84, respectively. This means that the commercial sector’s ECN is more responsive to changes in the number of electricity consumers rather than that of the mining and agricultural sectors’, which is less responsive. The positive relationship between consumers and ECN, especially in the commercial sector, is consistent with the findings by Alter and Syed (2011), but in the agricultural sector it is consistent with that of Khan and Qayyum (2009). However, a number of electricity consumers have a negative relationship with the industrial sector’s ECN, which is in line with the findings by Alter and Syed (2011). This indicates that with a one percent increase in the number of electricity consumers, the industrial sector’s ECN is reduced by 0.17 percent, which could be explained by the lack of availability of sufficient electricity supply Alter and Syed (2011) for the derivation of utility.
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THE PHYSICAL SECURITY OF BUILDINGS OF PUBLIC UNIVERSITIES

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Abstract. The issues of terrorism, protection against crime, anti-social behaviour, and sociopathological phenomena are current topics in today’s world. At present, there is no effective assessment in the Czech Republic of the physical security of buildings which could be the target of the threats. Within the security research of the Czech Republic, research was carried out whose main objective was to assess the existing level of physical security of public universities, with the subsequent determination of the minimum level of physical security of these buildings using new processes, practices, and technologies. In the Czech Republic, such research has not yet been realized. The main objective of the research was to thoroughly assess the current level of physical security of buildings at a representative sample of public universities, to create a security standard ensuring the minimum level of physical security of public universities against threats of terrorism, crime, anti-social behaviour, and also sociopathological phenomena. The contribution to the field of physical security in science is a rigorous assessment of the level of physical security measures of public universities, the analysis of criminal acts, security incidents, emergencies, risk designation, and the design of security measures. The benefit for practice is the creation of a security standard to ensure the minimum level of security of public buildings by physical security measures.

Keywords: physical security, public university, terrorism, crime, security standard, minimum level of physical security


JEL Classifications: O18

Additional disciplines: National Security; Economic Nationalism; National Security and War

1. Introduction

The subject of the research was the examination of the physical security issues of public universities as a whole. Physical security is a system of measures designed to prevent or hinder unauthorised access to a protected building, or to record his or her access or attempted access thereof (Reitšpis 2004). Schools and school facilities in the Czech Republic are called so-called soft targets. A soft target is a place with a high concentration of people and a low level of security against violent attacks, which are selected as a target for this type of attack due to the nature of the facility. The term attack is understood to mean terrorist, extremist, violent, arson, etc. (Fennelly 2004). The consequences of such attacks often affect a wider area, or require co-ordination when setting countermeasures. For the state, there is also a significant fact that soft targets are in great number. This greatly limits the practical possibilities of their security only on the part of the state or the public administration, and increases the importance of the security measures adopted by the soft targets themselves (Hofreiter 2015). The issue of physical security of public universities in the Czech Republic has not been given adequate attention for the long term. The research project focused on the area of security, with emphasis on the fight against terrorism, extremism, protection against crime, and sociopathological phenomena in connection with the situation in national and international
security in order to enhance the safety of persons on the premises of public universities in the Czech Republic. Physical security as a security area is primarily aimed at protecting individuals, property, and information by implementing physical security measures against threats that are usually the result of an infringement (Fay 1993; Sìtìkìvà., Starodumova 2019). The issue of physical security is, in Czech legislation, of fragmented design, and only generally, as a result of which the physical security measures are applied differently, and not always in the desired range, which is reflected in the level of security measures to ensure the physical security of public universities. The overall level of physical security is not sufficient, and can have a negative impact on emergencies and security incidents (Konečný, M. 2015).

2. Theoretical background

Within the Czech Republic, there are no comprehensive statistics of criminal acts, security incidents, and emergencies in public universities. Responsible representatives of individual public universities devote different attention to physical security issues, resulting in the level of protection achieved for each facility being at a different level. Often, individual levels of physical security are attained by responding to evolving security incidents, and not by the state of their system management. One of the causes of the described situation is the financial situation of public universities. Specific security designs are currently very often influenced by entities which carry out physical security as a business activity (Piwowarski 2012; Fabus et al. 2019). An employee responsible for physical security in a public university cannot rely on a professional opinion that would make it easier for him/her to make decisions in the physical security process. At the same time, a properly chosen and realized level of physical security contributes to the formation of the security consciousness of the entire population that passes through the education system. This security consciousness is part of the corporate responsibility of our own activities, which are reflected in the activities of businesses, organizations, and state and self-governing institutions. Another major issue that is not addressed by this article, but needs to be mentioned, is the unsatisfactory professional level of those responsible for physical security in public universities. The issue of physical security is analyzed by Coole, and emphasizes the expert security system established to diagnose a security issue in the physical security education process (Coole et. al. 2017, Coole et. al. 2012). National research has not yet addressed the issue of protecting the buildings of public universities. International research only focuses on the application of appropriate security technologies in the field of prevention of terrorism and other forms of unlawful conduct on the premises in the general sense, in which there are large numbers of people, with an emphasis on minimizing illegal entry and movement of persons in these buildings. Ensuring the physical security of public universities is a complex of technical and organizational measures aimed at minimizing risks to ensuring the safety of persons, and avoiding unauthorized manipulation of property by implementing appropriate safeguards (Fay 1993). Physical security of public universities must be treated in the same way as the physical security of any other public institution, however, taking into account certain specific conditions of the public university environment (Girdzijauskaite et al., 2019). Ensuring the physical security of public universities must respect the specific environmental conditions, as e.g. respecting academic freedoms and rights, organizing public events, concentration of residence and movement of persons at a certain time and period (day, academic year), variety of equipment and effects in multiple buildings, large areas or separate buildings situated between other purpose buildings, working in buildings not predisposed to college education, limited operating costs (Reitšpis 2004).

3. Research objective and methodology

The main objective of the research plan was to design a system of physical security for public universities. First, it was necessary to analyze the current level of physical security, to identify threats, risks, and to deal with the typology of potential offenders at the premises of public universities. In the next step, selected analytical methods were applied to assess security risks and threats in public universities. A suitable method for analyzing and managing safety incidents was then recommended to minimize the occurrence of a security incident and its impact on protected assets. The final step was to establish appropriate physical security measures in public universities in the form of a safety standard that would be applied in practice. The sequence of the individual steps of the research solution is illustrated in Figure 1.
**3.1 Assessment of the status and level of physical security**

The physical security system represents a conceptual system approach that defines effective physical security measures, including procedures and methods for the effective management of security risks in the university environment (Felson et al. 1998). Implementation of a properly set up system will improve and unify the method of ensuring adequate physical security for persons and property, including the establishment of appropriate physical security measures. Universities in the Czech Republic under the Higher Education Act are divided into public, state, and private colleges and universities. In the Czech Republic, there are currently 26 public universities, 44 private universities, and 2 state universities. Funding of a public university is predominantly provided by subsidies from the state budget. The funding of a private university is predominantly provided by the own resources of the founder of the school, and the state universities do not have legal personality, and are the organizational components of the state with limited university autonomy. The basic prerequisite for solving the research intention was to obtain objective information about the state and level of physical security in a large population, so the research had to focus on the category of public universities. The public university as a system in itself was divided into smaller units, and the lower organizational wholes are faculties. Of the total number of 163 faculties of public universities, a representative sample was selected, which was the subject of the research. It was based on the assumption that individual faculties have common and comparable elements of physical security, despite their specific field differences. A representative sample of universities was determined by the relationship:

\[ n = \frac{z^2 \cdot N \cdot r (1-r)}{(d^2 \cdot N) + (z^2 \cdot r(1-r))} \]  

- \( z \) the required degree of audit reliability (confidence coefficient 1.96)
- \( N \) the size of the basic set (163 faculties)
- \( d \) deviation tolerance rate (5% - 0.05)
- \( r \) expected deviation rate (qualified estimate of 0.02).
By calculation, twenty-five faculties were found to be the minimum size of the representative sample. The criteria for selecting a representative sample of faculties were the number of students and academic staff, the extent, and method of ensuring physical security. The extent and method of ensuring the physical security of selected public universities was mapped out by field investigations, and evaluated as indicators in percentage terms. Table 1 lists the current level of physical security measures for the buildings under investigation. Attention was also paid to the issue of illumination of objects, with interesting information on the subject published by Deryol, and with the emphasis on crime prevention in the field of research on the effect of outdoor lighting and its impact on illegal behaviour (Deryol et al., 2017). The data in Table 1 is partially reduced due to the large amount of information, and was supplemented by statistical data from publicly available sources, especially from sources published by the Police of the Czech Republic (Konečný 2015).

<table>
<thead>
<tr>
<th>Characteristics of the environment and buildings of public universities</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dislocation of a building in urban civil engineering</td>
<td>75</td>
</tr>
<tr>
<td>Building surroundings are freely accessible without boundaries</td>
<td>94</td>
</tr>
<tr>
<td>Easily accessible window construction holes</td>
<td>73</td>
</tr>
<tr>
<td>Main entrance from the building without barriers or other measures</td>
<td>75</td>
</tr>
<tr>
<td><strong>Technical measures for physical security</strong></td>
<td>%</td>
</tr>
<tr>
<td>Building entrance others</td>
<td>Mechanical barrier systems</td>
</tr>
<tr>
<td></td>
<td>Camera systems</td>
</tr>
<tr>
<td></td>
<td>Technical entry control systems</td>
</tr>
<tr>
<td></td>
<td>Alarm intrusion and emergency system</td>
</tr>
<tr>
<td>Building entrance main</td>
<td>Mechanical barrier systems</td>
</tr>
<tr>
<td></td>
<td>Camera systems</td>
</tr>
<tr>
<td></td>
<td>Technical entry control systems</td>
</tr>
<tr>
<td></td>
<td>Intrusion and emergency alarm system</td>
</tr>
<tr>
<td></td>
<td>Infrared heater</td>
</tr>
<tr>
<td>Outer shell of building</td>
<td>VSS</td>
</tr>
<tr>
<td></td>
<td>Security locks</td>
</tr>
<tr>
<td></td>
<td>Safety grilles</td>
</tr>
<tr>
<td>Building surroundings</td>
<td>Camera system</td>
</tr>
<tr>
<td></td>
<td>Fence</td>
</tr>
<tr>
<td></td>
<td>Fence</td>
</tr>
<tr>
<td></td>
<td>Security lighting</td>
</tr>
<tr>
<td><strong>Systems for technical protection in the interior areas</strong></td>
<td>%</td>
</tr>
<tr>
<td>Entrance hall</td>
<td>73</td>
</tr>
<tr>
<td>Corridors (main routes)</td>
<td>77</td>
</tr>
<tr>
<td>Doors</td>
<td>52</td>
</tr>
<tr>
<td>Faculty management</td>
<td>69</td>
</tr>
<tr>
<td>Lecture halls</td>
<td>37</td>
</tr>
<tr>
<td>Classrooms</td>
<td>58</td>
</tr>
<tr>
<td>Offices</td>
<td>39</td>
</tr>
<tr>
<td><strong>Guards</strong></td>
<td>%</td>
</tr>
<tr>
<td>Professional physical security</td>
<td>30</td>
</tr>
<tr>
<td>Reception - guards</td>
<td>70</td>
</tr>
</tbody>
</table>

Source: Konečný 2015
3.2 Determination of the significance of protected assets

Identifying protected assets is an important step in designing adequate physical security measures in a university environment. The primary purpose of identifying assets is to determine the subject of protection. Individual assets must be broken down into categories according to predefined criteria, as shown in Table 2. Subsequently, the assets are assigned values, then they are compared, and the critical assets are selected from the point of view of physical security.

<table>
<thead>
<tr>
<th>Tangible asset</th>
<th>Criterion of financial value</th>
<th>Criterion of replaceability</th>
<th>Criterion of misuse/abuse</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low value €</td>
<td>Medium value €</td>
<td>Medium value €</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intangible asset</th>
<th>Criterion of financial value</th>
<th>Criterion of replaceability</th>
<th>Criterion of misuse/abuse</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low value €</td>
<td>Medium value €</td>
<td>Medium value €</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Konečný 2015

3.3 Risk assessment and minimization process

The process of risk assessment in a public university environment is crucial to meeting the main goal of the research plan. Risk identification and modelling have been carried out with a view to the process and structural approach and the determination of the acceptability limit with regard to the interdependence of individual risks. The risk assessment was carried out with respect to the priorities and purpose, based on the selected relevant data obtained through the field survey, including the typology of potential offender. The evaluation was compared in terms of acceptability. Risk assessments included characteristic implications, including synergy and the domino effect. The results were compared with several risk analysis methods. In assessing the physical security of public universities, the path of identifying the chain of danger - threats - damage - harm, the illegal activity was taken into account. On the basis of the analyses carried out, it was proposed to minimize them at an acceptable level for selected risks. The process of risk management in a public university environment is illustrated in Figure 2.

<table>
<thead>
<tr>
<th>Identification of a source of risk</th>
<th>Method selection</th>
<th>Risk assessment</th>
<th>Defining aims</th>
<th>Barriers preventing success</th>
<th>Regulation of risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>risk search, recognition, description</td>
<td>Ishikawa, ETA, FTA, FMEA, CARVER</td>
<td>determining the level of risk: acceptable – unacceptable</td>
<td>realistic, measurable, planned</td>
<td>primary, secondary, tertiary</td>
<td>decision making, realization, monitoring</td>
</tr>
</tbody>
</table>

Fig. 2. Risk management process in public universities;

Source: authors
The risk management process is based on the systematic identification of sources and potential failures that could have a negative impact on the protected interest of a public university. The primary prerequisite for effective risk assessment is the choice of the appropriate method (Broder 2006). In the process of risk assessment in public universities, methods of observation and inductive thinking and techniques based on the description and comparison of evidence and verification of statistical data were used. Using the comparison, the outputs of the individual analyses were used for tertiary risk assessment. The resulting set of undesirable risks was subjected to a qualitative assessment. As part of this process, a panel discussion was carried out by investigators and practitioners over the evaluation of identified security risks, along with the proposal for physical security measures for public universities. The process of risk assessment in public universities was divided into three phases, as shown in Table 3.

<table>
<thead>
<tr>
<th>Phase 1 Data collection</th>
<th>Phase 2 Identification of risks and threats</th>
<th>Phase 3 Clarification of results and verification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brainstorming, Check list, Delf method</td>
<td>FMEA, Ishikaw diagram, ETA, FTA</td>
<td>FMEA + CARVER, Paret’s principle, Lorentz curve, KARS method</td>
</tr>
<tr>
<td>• Selection of the building under consideration.</td>
<td>• Consultation with experts from the area of physical security.</td>
<td>• Clarification and verification of outputs of primary FMEA analysis.</td>
</tr>
<tr>
<td>• Obtaining theoretical and practical starting points.</td>
<td>• Application of selected methods of risk analysis.</td>
<td>• Using Paret’s principle with the Lorenz curve.</td>
</tr>
<tr>
<td>• Data collection and processing.</td>
<td>• Identification and assessment of significant risks in the environment of public universities from procedural and structural points of view.</td>
<td>• Correlation method.</td>
</tr>
</tbody>
</table>

Source: authors

The risk assessment process identified potential threats to the physical security of public universities. The threats have been assessed from a procedural point of view, the cause of which is human, and from structural, the cause of which is a system or technical error. The most significant risks are unauthorized access to the building, dangerous materials being brought into the building, explosive alarm system, insufficient area security or free space access, physical security failures, key mode failures, and asset theft. Assessing the state and the level of physical security of public universities has found that the state and level of physical security is insufficient, inefficient, and the security technology used does not meet the current security requirements. Serious findings have included the fact that public universities underestimate the importance of professional physical security.

3.4 Systematic method of analysis and management of security incidents

An innovative analytical method designed to assess and address an unexpected security incident from a physical security point of view was proposed. The aim of the method is to identify the root cause of the problem, and to establish corrective and preventive measures to minimize their recurrence. The method, with its repressive and preventive nature, is suitable for undesirable situations that need to be addressed quickly and efficiently. It represents a structured and documented process for the solution of the incident which, when properly implemented, helps solve the problem in a timely and complete manner (Garcia 2001). Determination of appropriate measures and their planning is based on data leading to the removal of the true causes of the problem itself, and not just its consequences. The principle of the method of managing security incidents lies in the systematic solution of the problem using a standardized form, consisting of eight consecutive phases, as shown in Table 4. This procedure defines the practical solution and application of the method of analysis and management of security incidents in the university environment. The primary objective is to minimize the recurrence of the adverse event, including the negative impact on the protected assets of the university. The condition is that a team of responsible and interested persons with the necessary expertise will be involved in the process, and will correctly identify the root cause of the problem and establish appropriate corrective and preventive measures. Thereby, the university gains a simple tool to manage incidents or emergencies that pose a significant risk to universities from a physical security point of view (Mach et al. 2013).
Tab. 4 Process of systematic analysis and management of security incidents

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| F0 | Initial phase | - determination by the team  
- preparation and planning  
- initiate an inquiry according to a systematic form |
| F1 | Defining the problem | - unambiguous definition of the problem  
- 5W/2H application |
| F2 | Comparison of risk of a similar nature | - assess the risk of the occurrence of a similar problem in other university areas |
| F3 | Necessary corrective action | - implementation of the necessary measures within 24 hours,  
in exceptional cases within 48 hours |
| F4 | NO/OK analysis | - finding the root cause of the problem  
- determine detection and occurrence factor + validation |
| F5 | Effective corrective and preventive measures | - implementing the measures  
- the economic aspect and the expected efficiency |
| F6 | Efficiency monitoring set measures | - monitoring detected factors and occurrence factors  
- monitoring from the onset of incidents |
| F7 | Evaluation of acquired data | - lessons and experience from incident investigation  
- risk elimination declaration  
- distribution of outputs |

Source: authors

3.5 Categorization through security zoning

The proposal for the categorization of individual buildings and premises is a prerequisite for setting appropriate physical security measures. In the specific environment of a university, security zoning involves preventive measures to minimize identified risks, and to determine the vulnerability of defined buildings or spaces. Such buildings and premises may remain accessible, however, while adhering to specified security measures that may be specific to individual groups of people, part of the day, or even period of the academic year. This is a regime measure that has a direct effect on the movement of persons in the security zone, which consists of defined technical measures or clearly defined boundaries. The principle of security zoning in the profiled conditions of universities is based on the division of individual areas into security zones (Ščurek et. al. 2014). The relationship between the asset categories and security zones in the university environment and the principle of the application are shown in Table 5.

Tab. 5 Relationship between asset categories and security zones

<table>
<thead>
<tr>
<th>Asset category</th>
<th>Security zone</th>
</tr>
</thead>
</table>
| I. Buildings and areas of considerable importance | Non-public zone  
area protected by increased security levels  
Secured zone  
area with the highest level of security measures  
Protected zone  
area with medium-level security measures  
Controlled zone  
area with a lower level of security measures |
| II. Buildings and areas of usual importance | Public zone: area protected by basic security levels |
| III. Buildings and areas of low importance |   |
| IV. Buildings and areas of special importance |   |

Source: authors

3.6 Multi-criteria analysis of the choice of appropriate security technology

For practical implementation, it is necessary to determine which technology is best suited to the task at hand. The goal is to make a decision on which option is best, on the basis of the given criteria. The solution is to use multi-criteria analysis. Multi-criteria decision making is a marketing tool for mathematically calculating the right marketing strategy based on predetermined criteria, and assigning weight to these criteria (Ploch et.
al. 2016). The issue of ensuring an adequate level of physical security for public universities is specific and quite extensive. Because of the potential threats and risks in a public university environment, it is necessary to choose appropriate modern security technology, in particular Radio Frequency Identification (RFID) and biometric systems. In particular, RFID technology, as stated by Quan Qian, is also usable for building tracking and monitoring (Quan Qian et. al. 2016). For the correct assessment of the appropriate technology, a multi-criteria analysis was performed, the output of which is shown in Table 6.

<table>
<thead>
<tr>
<th>Criteria $K_i$</th>
<th>Unit</th>
<th>Weight $V_i$</th>
<th>Comparative criteria $K_{ci}$</th>
<th>Assessed values</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>$K_1$ Acquisition and operating costs</td>
<td>€</td>
<td>0,167</td>
<td>0,4</td>
<td>0,8</td>
<td>0,3</td>
<td>0,9</td>
<td>0,9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$K_2$ Difficulty of realization</td>
<td>8</td>
<td>0,133</td>
<td>0,5</td>
<td>0,6</td>
<td>0,4</td>
<td>0,9</td>
<td>0,8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$K_3$ Spectrum of application</td>
<td>7</td>
<td>0,117</td>
<td>0,3</td>
<td>0,9</td>
<td>0,2</td>
<td>0,6</td>
<td>0,2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$K_4$ Reliability of detection</td>
<td>%</td>
<td>0,150</td>
<td>0,2</td>
<td>0,1</td>
<td>0,4</td>
<td>0,3</td>
<td>0,3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$K_5$ Detection speed - passage</td>
<td>person/hour</td>
<td>10</td>
<td>0,167</td>
<td>0,4</td>
<td>0,6</td>
<td>0,2</td>
<td>0,4</td>
<td>0,3</td>
<td></td>
</tr>
<tr>
<td>$K_6$ Difficulty of evaluating data</td>
<td>6</td>
<td>0,100</td>
<td>0,3</td>
<td>0,5</td>
<td>0,3</td>
<td>0,4</td>
<td>0,4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$K_7$ Influence of human factor</td>
<td>5</td>
<td>0,083</td>
<td>0,4</td>
<td>0,1</td>
<td>0,4</td>
<td>0,6</td>
<td>0,7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$K_8$ Service, service life, maintenance</td>
<td>5</td>
<td>0,083</td>
<td>0,4</td>
<td>0,4</td>
<td>0,3</td>
<td>0,7</td>
<td>0,4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>60</td>
<td>1</td>
<td>0,4</td>
<td>0,5</td>
<td>0,3</td>
<td>0,6</td>
<td>0,5</td>
<td></td>
</tr>
</tbody>
</table>

Source: authors

This is a decision matrix with predefined criteria that, based on brainstorming, had been assigned the weight and degree of compliance with a given security technology. Criteria for the decision matrix were determined on the basis of empirical experience of security systems procurement in the physical security of public universities. Five technologies were assessed: A – biometric: fingerprint, B - biometric: eye scan, C - RFID: passive, D – RFID: active, E - video surveillance systems. Criterion $K_i$ was marked as $K_{1–8}$ and they were assigned to corresponding units. The criteria are rated by a score of 1 to 10, which indicates the relevance of each individual criterion. The first one represents the smallest value. According to the formula, the criterion weight was determined.

$$v_i = K_i / \sum K_i$$

(2)

For each technology, their compliance with the criteria was expressed. A zero value means that the technology meets the criteria without reservations, and the value one means that the technology does not meet the criteria. A suitable variant is determined by the relationship where the lower the value for $v_i$, the higher the consistency and potential of the effective implementation of the security technology (Konečný et. al. 2014).

$$K_i = \sum_{i=8}^{8} K_{ci} \cdot v_i$$

(3)

Through multi-criteria analysis, it was found that, given the cost, use spectrum, implementation difficulty, reliability, and speed of detection, the key criteria are $K_1, K_4, K_5$. Criteria $K_2, K_3$ are also considered. A suitable security technology in a university environment is passive RFID and fingerprint biometrics. Video surveillance systems hold an irreplaceable position in security technology for the examined environment. Mutual integration of these security features is a prerequisite for ensuring an adequate level of security for persons and property against terrorism and other forms of illegal activity.
3.7 Effectiveness of the system for the protection of persons and property

In the next part of the research, it was necessary to deal with the issue of effectiveness of security systems for the protection of persons and property. In general, efficiency is defined as a measure of the positive deviation of the goal achieved from the desired goal or as a measure of success. An effective system of protection of persons and property requires a system that fulfills the basic condition that the time of attack \( T_N \), or respectively the total time of breaking internal and external protection elements \( T_{DRL} \) is greater than the response time of the intervention unit \( T_{FO} \). This means \( T_N > T_{FO} \), or respectively \( T_{DRL} > T_{FO} \) (Korzeniowski 2008). Fulfillment of this condition may not always be sufficient, but the declaration of the safety system as effective is a necessary condition. An important parameter that describes the efficiency of a given system is the coefficient When this coefficient is lower than one, then the effectiveness of safeguards is inadequate and the whole security system is ineffective. When the coefficient is greater than one, then the effectiveness of the security measures, and therefore the whole security system, is greater. If the intruder is detected by the active protection elements, then the coefficient is defined by the relationship (Loveček et. al. 2011):

\[
Q_{ocmr} = \frac{T_N}{T_{FO}} = \frac{T_p + T_{RES} + T_{di} + T_{in}}{T_{pop} + T_{ver} + T_{pres} + T_{zas}} \quad \text{for} \quad T_N > T_{FO}
\]

\[
Q_{ocmr} = \frac{T_{DRL}}{T_{FO}} = \frac{T_p + T_{RES}}{T_{pop} + T_{ver} + T_{pres} + T_{zas}} \quad \text{for} \quad T_{DRL} > T_{FO}
\]

If the intruder is detected by physical security, then \( Q_{ocmr} \) is defined by the relationship:

\[
Q_{ocmr} = \frac{T_N}{T_{FO}} = \frac{T_p + T_{RES} + T_{di} + T_{in}}{T_{HL} + T_{pres} + T_{zas}} \quad \text{for} \quad T_N > T_{FO}
\]

\[
Q_{ocmr} = \frac{T_{DRL}}{T_{FO}} = \frac{T_p + T_{RES}}{T_{dL} + T_{pres} + T_{zas}} \quad \text{for} \quad T_{DRL} > T_{FO}
\]

\( Q_{ocmr} \) coefficient of effectiveness of protective measures, \( T_N \) total time of invasion by the intruder from the time of detection by the active elements of the protection until his leaving the guarded area, \( T_{DRL} \) total time to break through passive protection elements, \( T_{FO} \) total response time of the intervention unit, \( T_p \) time to break through all passive protection features, \( T_{pres} \) the total time required for the intruder to move to the protected interest until the moment of detection by the active elements of protection in time, \( T_{di} \) time of intruder attack, \( T_{in} \) time of intruder escape, \( T_{pop} \) time of alarm, \( T_{ver} \) time of attack verification, \( T_{pres} \) time of move to site, \( T_{zas} \) time of intervention against the intruder, \( T_{HL} \) the interval between two physical security inspections or patrols.

Foreign literature, unlike coefficient \( Q_{ocmr} \), shows the parameter characterizing the minimum delay time en route to the protected interest, which is defined by the relationship:

\[
T_{MIN} = \sum_{i=1}^{n} \Delta t_i
\]

\( \Delta t_i \) the delay time of the intruder in overcoming individual security measures of the security system, or overcoming the distance between individual zones.

The disadvantage of time \( T_{MIN} \) is that it does not even take into account the probability of intruder detection during his/her journey, or the time of the intervention unit. The problem of assessing the uncertainty of the security system is addressed by Szulim, who emphasizes efficiency coefficients in the application of mathematical models in five basic steps in relation to electronic security systems, using the Monte Carlo method (Szulim et. al. 2014). Another important parameter that relates to physical security, as a whole, is the probability of intruder detection \( P_i \). This parameter defines the probability that the intruder will be detected or eventually eliminated en route to a protected interest. This parameter, in contrast to the above, takes into account the probability of intrusion detection, the probability of a successful response of the physical security intervention unit, and the effect of stochastic phenomena. The probability \( P \) is based on the evaluation criterion of the physical security
of the building’s system, and that the total time of invasion $T_N$ by the intruder from the moment of detection by the active protection elements until he/she leaves the guarded area or $T_{PRL}$ the total break time of the passive protection elements must be greater than the reaction time Physical security intervention units $T_{FO}$. Tedy $T_N > T_{FO} $, respectively $T_{PRL} > T_{FO} $. The following conditions arise from the criteria shown:

$$ T_N - T_{FO} > 0, \text{respectively } T_{PRL} - T_{FO} > 0 $$

The likelihood of intruder detection is defined by the relationship:

$$ P_1 = \frac{n!}{x! (n-x)!} p^x (1-p)^{n-x} $$

$p_1$ the probability of intrusion detection by a given detector, $n$ number of detectors, $x$-tý detection attempt, $p$ probability that the intruder is not detected (Loveček et. al. 2011).

Results and discussion

This article focuses on the physical security of Czech public universities, with a focus on the protection of persons and property, especially against terrorism, various forms of crime, anti-social behaviour, and sociopathological phenomena. The prerequisite for launching security research was that the issue of protection of Czech public universities had not been given adequate attention. There is no comprehensive legal regulation or safety standard that regulates overall and conceptually this area of building protection. There is no recommendation to ensure a minimum level of physical security in the environment of Czech public universities. The overall level of physical security is inadequate, and can have a negative impact on the safety of persons and property in the event of emergencies and security incidents. Research data has been drawn from real practice, and the results of the research are implemented in practice.

Conclusions

The main objective of the research was to propose a system of physical security measures in Czech public universities which will ensure an adequate level of protection of persons and property against terrorism, other forms of crime, anti-social behaviour, and sociopathological phenomena. The main objective of the research was fulfilled by a thorough assessment of the existing level of ensuring the physical security of buildings at a representative sample of public universities, followed by the development of a security standard in the form of a certified methodology approved by the competent authorities of the Ministry of the Interior of the Czech Republic. Contribution to the practice is seen in the elaboration of a methodical procedure for designing the physical security of public universities, and putting them into practice. The methodology provides prerequisites for increasing the level of protection of persons and property in the environment of Czech public universities. The contribution of the research to the field of science is to obtain information about methods of ensuring the physical security of selected buildings of Czech public universities, an overview of criminal acts, security incidents, and extraordinary events in this environment. Such a range of information has not previously been gathered. A new analytical and systematic method has been developed in the field of risk prevention and repression to identify the root causes of the occurrence of undesirable events, and to establish immediate corrective and preventive measures. An innovative system of physical security for public universities has been designed. The prediction of further research in this area is directed towards exploration of possible models (pessimistic, realistic, pragmatic, and optimistic) in which the effectiveness of the system of protection of the buildings of Czech public universities is assessed. The article was prepared from the scientific outputs obtained within the Security Research Program of the Czech Republic, within the successfully defended project “Assessment and standardization of physical protection for public university buildings”, on which the authors participated as co-investigators. The output of the project was a certified methodology for ensuring the physical protection of public universities in the Czech Republic.
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How the Currency Crisis Effects the Relationship between Financial Inflows and Economic Growth in ASEAN Country

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Abstract. The prime aim of the study was to investigate the impact of the financial inflows on the economic growth of ASEAN economies. Meanwhile, the study has examined the moderating role of currency crisis in the relationship between financial inflows and the economic growth of ASEAN countries. The study has employed the panel data methodology to achieve the research objectives. Theoretically and empirically it seems that foreign capital inflows have different possible effects on growth and development performance of an economy. If foreign capital inflows are used in an efficient and productive manner then, they will promote country’s growth performance. If foreign capital inflows are used in unproductive manner then they will not contribute in a long run, their impact on economic development will only for a short run. Furthermore, the financial crisis (currency crisis) also have a significant influence in the attraction of foreign capital inflows. These financial crises effect the flow of foreign capital inflows among the countries. The results suggest that the flow of workers’ remittances in the country has significant positive impact on economic growth. Moreover, the banking and systemic crisis hurt the relationship between REM and EG. Worker remittances are considered as a boon to the countries. It has a positive association with the economic growth and acts a stabilizer during the financial crisis. To ensure the effective inflows of the remittance the government should encourage that remittance should be transferred through formal channels, this can be done by giving cost effective financial services to the remitter, linking the remittance transfer with mobile networks and banks that charge low prices.

Keywords: ASEAN countries; financial inflows; economic growth


JEL Classifications: G1, F23

1. Background

Foreign capital inflows play a significant role in the economic growth (EG) of both developing and developed countries (Raza & Jawaid, 2014; Shuyan, Fabuš, 2019; Tvaronavičienė, 2019; Zeibote et al., 2019; Polyakova et al., 2019). Foreign direct investment increase the productive capacity of the economy, aid, grants, exports of goods and services and the workers’ remittances (Bahattab, 2015; Olowa & Olowa, 2017). Financial aid and grants are considered as a volatile or event-based flow of foreign capital in the economies whereas, foreign direct investment, external debt, workers’ remittances and exports of goods and services are considered as a more sustainable form of foreign capital inflows for developed and developing economies. As a consequence, a large literature has grown, analyzing the cyclical behavior of capital inflows, mostly in emerging economies (Branner & Ventura, 2016). The existing literature has shown that foreign capital inflows are volatile and pro-
cyclical and is declines during crisis times. These patterns have more intensity in the countries having different income levels and are also referred to—sudden stops‖ that refers to immense collapses in capital inflows that subsequently brings crises (Georgiadis, 2016; Orumwense, 2017).

The recent wave of financial globalization experienced worldwide in recent decades was marked by a significant movement of flow of international capital between countries. These assets are mainly in the form of loans, foreign direct investment (FDI), exports of goods and services (EXP) and remittances by workers (Jake, 2017; Jacqueline & Paul, 2017). Countries that have opted for their financial sector liberalization were intended to enjoy the effects expected of such a policy. Indeed, by lifting restrictions on incoming and outgoing international capital movements, financial liberalization improves the sharing of risk, the effectiveness of an international allocation of capital and the promotion of financial development and EG. Foreign direct investment, workers remittances external debt and exports of goods and services are the main sources to collect the foreign capital inflows in the economy (Chow, 2017; Sawalha, Elian, & Suliman, 2016). These all foreign capital inflows play a vital role in economic development of an economy. Empirical studies conclude that these foreign inflows have positive as well as negative impact on economic development and results vary between different countries.

Debates on foreign direct investment, both in academia and in industries, majorly indicate that these flows to a suite of benefits for the host country. FDI was reported as an essential source for the development of economy in the developing countries. FDI not only resulted a reduction in unemployment by creating more employment opportunities but it also provides assistance by technology transfers, accelerates local investment, nurturing human capital and institutions in the host developing countries. The literature has identified two main theories on the basis of endogenous and exogenous growth. These theories have used in the existing literature in order to explain the relationship between FDI and EG.

Most of the innovations and new technologies are created in developed countries. For developing countries, the only chance is to import this technology. Due to financial constraints, the formal transfer of technology seems to be too expensive for these countries. More viable options in terms of cost are international trade and FDI. Past studies suggest the FDI as a main vector for technology transfer. This approach is also justified by the fact that about 70% of expenditure on research and development in the world are concentrated in a small number of multinational corporations. The increased interest for the externalities of the FDI seems to be explained first of all by the increase in flows to the host country.

The developing countries in general increased measures to attract foreign investors. FDI flows are particularly encouraged by developing countries as perceived as a universal panacea and as a panacea to the problems of transition. The literature considers technology transfer associated with flows of capital as the essential part through which FDI contribute to economic development in the host country (Danakol, Estrin, & Weitzel, 2017; Jin, García, & Salomon, 2019). Thus, even without any contribution to the accumulation of capital, the FDI should stimulate technical progress through the transfer of technology and knowledge. If at the theoretical level, the arguments are obvious, the lack of solid empirical evidence remains surprising. Despite the relative consensus in the literature on the fact that foreign enterprises enjoy a direct transfer from the parent company, it has no clear indications about the effects driven at the level of local enterprises. It is theoretically possible that increased competition can compensate any indirect transfer of technology, leading to an overall impact neutral, or even negative.

Remittances by the migrant workers have played a crucial role in nurturing the economic development in the respective countries (Jouini, 2015; Rahma, 2017). Remittances are said to be different from other foreign capital inflow like FDI, loans and aids because these are of stable nature relatively (Bukhari & Munir, 2016). On the other hand, remittances are found to be in a positive trend when the host economy suffers a recession because of financial crisis, political conflicts or natural disasters etc. as expatriates remit more during crucial time for so that they can support their nations accordingly (Jouini, 2015). Increase in workers’ remittances also resulted in an increase in the private investments. In economic downturn and adversity, such remittances continue to increase and are found to be comparatively less volatile than FDI in those countries that have high marginal propensity to invest.
The FDI inflow in ASEAN countries is shown in figure 1.

![Figure 1. FDI inflows in ASEAN countries](image)

Source: World Bank

Foreign capital inflows play a significant role in the EG of developing and developed countries (Rahman, & Castelli, 2013; Raza & Jawaid, 2014). Foreign capital has been considered as a key element in the process of economic globalization and integration of the world economy. The flows of foreign capital have been welcomed, to complement domestic financial resources, as a development catalyst. The experience of the newly industrialized or emerging economies has firmed the belief that foreign capital could fill the resource gap of the capital-deficient economies (Bahattab, 2015).

These all foreign capital inflows play a vital role in the economic development of an economy. Empirical studies conclude that these foreign inflows have positive as well as negative impact on economic development and results vary between different countries. Foreign direct investment (FDI) are perceived as a factor of EG, a complement to domestic investment and a source of financing of the current account deficit. FDI contribute the host country in the form of technological externalities, the formation of human capital or have access to foreign markets which lead to long-term EG (Iwasaki & Tokunaga, 2016; Rusomyo, Junlin & Mangare, 2017). FDI also resulted a reduction in unemployment by creating more employment opportunities in host economy (Jouini, 2015).

The increase in workers’ remittances also resulted in an increase in the private investments (Jongwanich, 2007). Furthermore, remittances are found to be in a positive trend when the host economy suffers a recession because of financial crisis, political conflicts or natural disasters etc. as expatriates remit more during crucial time for so that they can support their families and nations accordingly (Jouini, 2015).

Some empirical studies also found the negative impact of workers ‘remittances on EG. The EG may have negative impact of capital inflows (remittances) in the host country which causes the decrease in labor force participation. This type of capital inflows may consider just as transfer of income. Furthermore, this transfer of income may be stressed by severe moral hazard problem. In this regard, the recipients promotes to use alternate way of consumption and the labor market effort reduce accordingly (Raza & Jawaid, 2014). The migrant’s remittances may not be considered as profit driven due to spending on consumption rather than on investment activities (Lim & Simmons, 2015; Satya & Kuraesin, 2016). The imports may increase through remittances in the country which further widen the deficit in balance of payment (Jouini, 2015).

Theoretically and empirically it seems that foreign capital inflows have different possible effects on growth and development performance of an economy. If foreign capital inflows are used in an efficient and productive manner then, they will promote country’s growth performance. If foreign capital inflows are used in unproduc-
tive manner then they will not contribute in a long run, their impact on economic development will only for a short run. Furthermore, the financial crisis (currency crisis) also have a significant influence in the attraction of foreign capital inflows. These financial crises effect the flow of foreign capital inflows among the countries. Furthermore, the required external debt for the development projects are also become scare for the developing economies because of the consistent events of financial crisis.

2. Literature Review

2.1. Foreign Debt and EG

A country’s debt can be determined in several ways. There is need to define different types of debt that are linked with an economy. Debt can be private or public. The debts, which are contracted by the government, are called public debts. Alternatively, private entities contracting the debt are referred as private debt. The public debt, which is contracted by the government, can be classified in two debts (internal public debt and external debt). The total of all the debts used by different departments of the State is referred as public debt. Three main factors are linked with public debt such as debt used as interest on previous debt, public spending on various goods/services, debt derived from monetary policies and foreign exchange. Public debt can be referred as the debt between foreign debt and domestic debt. The internal part of the debt is based on the debts, which are contracted with the national lenders by the government.

These types of debts are made through contracts with the internal market specifically through debt securities insurance. Alternatively, the external debt is the total debts, which are contracted with the foreign creditors by the government. The foreign creditors can be from different states, IMF, foreign banks, etc. A country’s external debt can be measured in different ways. It was argued by RAZA (2017) that external debt is caused because of international position of investment, gross external debt, and external debt. The total debt instruments of non-residents and residents are included in the gross foreign debt. This refers to the total amount of foreign debt based on private and public foreign debt. The different between liabilities and financial assets of non-residents and residents is referred as the international investment position. Further, the gross foreign debt excluding the total debt instruments of residents and non-residents is referred as net external debt. Debt has been defined by Turner (2017) to be equal with the country’s total liabilities i.e. private and public, with the international creditors. This is referred as the gross external debt.

The definition of external debt is followed by the issues of debt crisis. Following the literature studies, this definition of external debt has been used in this research. The non-compliance of a country’s obligations with its international creditors is referred as foreign debt crisis. There can be two forms of debt crisis. In the first form, it occurs when there is need for a country’s government to restructure its debt. The second is the type, when the government of a country fails in its obligations. The terms of loan are negotiated in the restructuring of debt. The International Monetary Fund supports in the restructuring of debt as in the case of Greece. It has been claimed by Turner (2017) that partial default is constituted by these. The interest rate is reduced in the restructuring of debt. Further, investors are arrested with illiquid by the restructuring of debt that is not renum-bered for years. It becomes a huge cost for the investors in terms of illiquidity. Investors are forced to hold assets having risk and they are given compensation less than the market value. Alternatively, when a country becomes defaulted, this is the extreme crisis. The country becomes unable to comply its obligations with that of creditors. Most of the existing research studies are based on this aspect. Moreover, the economic literature is amid by these two types of circumstances. However, some research studies assume that a country’s utilization of huge loan to foreign institutions with the existence of crisis. This study will help in understanding that in any of the previously discussed situation, debt crisis occurs.

In explanation, when a country deals with IMF pertaining to high loan, the country is working on debt restructuring, or there is a default situation, all these refer to debt crisis. To fulfill research objectives, it is crucial to determine the association between external debt and rate of EG. Extensive literature studies exist on the association of these variables. The big recession occurred during 1980-1983 hit almost every economy in 1979
after the second oil crisis. Serious difficulties were experienced by the indebted economies to managing their debt because the interest rate became very high.

Several studies have worked on understanding the way in which debtor countries were influenced by excessive debt particularly through EG. Irrespective of various research studies available on the association of external debt and EG, there is need for drawing a conclusion. The results of the literature studies vary as per the countries and the situation under which the research has been conducted. Two aspect of casual relation can be used for analyzing the relation among these variables. The first is to analyze through the influence of external debt on the growth of economy and the second is through the influence of EG on foreign debt.

The focus of the previous studies has been on analyzing through the influence of external debt on EG. In this research, the causality relation has been used in this research for external debt and EG. The relevant research studies have been conducted for the associations.

2.2. Remittances of Workers and EG

A crucial source of income for the emerging economies is the worker’s remittances. EG is influenced by remittances due to the stability in contrast to other external capital inflows including FDI, aids, and loan. It was reported that there were $440 billion remittances in 2009, which were made through official channels. There has been a positive trend of remittances over the past two decades. A decline has been revealed in FDI over the last five years in several emerging economies. This is due to continuous increase in remittances of workers.

Some emerging economies have greater remittances as compared with FDI. A crucial role is played by worker’s remittances in the development of emerging economies (Jouini, 2015). There is difference in remittances and inflow of foreign capital such as aids, loans, and FDI due to the nature of stability (Siddiqui, & Anjum, 2013; Bukhari & Munir, 2016; Hussain et al., 2019). Alternatively, there is positive trend in the remittances when recession i.e. political instability, financial crisis, or disasters prevail in the economy. In this situation, more remittances are expatriated by the workers in other countries to support their nation (Jouini, 2015). It has been argued by some research studies that there is a positive association between EG and remittances of workers (Jouini, 2015). Precisely, investments or consumptions can increase significantly through remittances of workers in the host economies. This reflects the development of country through use of remittances in an efficient way. Poverty can be alleviated through workers’ remittances in the emerging countries (Jouini, 2015).

Private investments increase with the increase in worker’s remittances. These remittances are not volatile as compared with the FDI in the economies having higher investment marginal propensity during the time of adversity and economic downturn. These kinds of foreign capital inflows are important for the emerging economies as these are likely to influence EG. Serious consequences can be created on EG in the host country. The funds of investors increase directly through capital accumulation by remittances. This also increases human and physical capital in the host country. Alternatively, the credit merit is increased for the local investor that leads to decrease in the country’s capital cost. With the decrease of cost, new investment borrowings are resulted. In the similar way, the economic stability can be expedited by remittances in the host country and it becomes less volatile. The risks are reduced in the host country for increasing investment (Raza & Jawaid, 2014). Capital inflows can created a negative influence on EG in the host economy that leads to decline in the participation of labor force. These inflows can be regarded as income transfer. Moreover, income transfer can be pressurized through the issues of moral hazard. Alternative consumptions ways are promoted through recipients in this regard and effort of labor market declines as well (Raza & Jawaid, 2014). The overall productivity can be influenced through remittances by increasing the effective investment that changes the financial intermediation of the receiving country.

Remittance can be considered as capital inflow in which the amount of remitter is invested and the pattern of investment is distressed because of the benefits and informational drawbacks as compared with the financial intermediaries, which are local. Remittances may increase the funds in the banking system. In this way, EG can be improved through financial expansion (Williams, 2018).
The import bills can be paid through sum of foreign exchange reserves. However, a crucial dilemma is the gap in the foreign reserve for the emerging economies. The earning of foreign exchange can be strengthened through remittances particularly for the emerging countries. An opportunity is created by inflows of remittances for reduction in the foreign exchange gap of reserves. Previously, several studies have empirically signified this through use of cross sectional and panel data to define the relation between remittances and EG (Jawaid & Raza, 2016; Meyer & Shera, 2017; Sorbi, & Farrokhnia, 2018). Moreover, fewer research studies have worked on this empirically using time series analysis.

2.3. Exports and EG

The purpose of this section is to review the theories of economics, which can assist in explaining the association of growth and trade. Specifically, the main contributions of trade theories and growth theories have been assessed to understand the association, the extent, and causality. The Economic Sciences and economic thought is combined in the growth and trade theories. The importance of trade for generating wealth of Nations was stressed by several economists including David Ricardo, and Adam Smith. It was argued by the economists that for increasing the wealth and welfare of economies, international trade is vital. It was anticipated that different factors act as inducer for growth and some hinder it at the intuitive level. It was considered by Smith that development of human capital and economies of scale are important in contrast to other factors.

The growth and trade theories have common origin in economies and these have been targeted by the scientific developments particularly in the period of postwar. The growth and trade theories are taught using the same methodologies and hypotheses framework in different ways. The trade theories are considered as the microeconomics extension but this is still in the initial stage. The models with which the trade can be studied in the macroeconomics are sought.

The growth theories are considered to the originated from macroeconomics. Unusual and intense efforts are being made to substantial the macroeconomic models in the bases of microeconomics. The growth models, which are most striking, have been developed in a closed economy with no trade relations. Recently, effort is being made to integrate the theories of trade with growth.

The individual contributions of growth and trade theories have been discussed in the next paragraph. The difference in the visions of new theories as compared with the traditional theories with respect to the relation of growth and trade has been analyzed. Further, an overview has been presented for the theoretical concepts about the relation between these variables. There are two classifications of traditional theories of trade, which include classical and neo-classical trade theories. The theoretical relations of the comparative advantages related to trade have been discussed. Previously, the focus of these theories was on the static factors of the benefits as compared with the new trade theories, which highlight dynamics of the benefits. The efficient production allocation is involved in the traditional theories, which focus on equilibrium in the models of trade. The economies involved in trade must have maximization of benefits and trade benefits. The constant scale of production and perfect competition are assumed in these models.

Particularly, there is constant marginal return of a production factor in a classical theory. However, this has become descending in the neo-classical theories. In long term, the equilibrium conditions of these models can be regarded as practically applicable. The trade development because of opening trade and gains of economies being enhanced through use of comparative advantages has been discussed by these theories. Greater allocation of technology can be resulted through liberalization of trade between two countries. Therefore, the high level of production and welfare is resulted.

The comparative advantage theory of Ricardo is the most complete and widespread in view of a classical trade theory. Earlier, Smith had established an absolute advantage theory based on his theory of value and production. According to the theory, the countries earn income and welfare gains to maintain a situation of free trade among themselves. Each country specializes in some measure in the production and exportation of some goods, which
produces these goods more cheaply in absolute terms as compared of its partners. The exchange of goods through exports allow countries to share the advantages of lower costs of production through absolute advantage that each has or has developed in one sector or another.

In bases similar to those of Smith, but elaborating on the role of labour force as main source of wealth, Ricardo formulated the theory of comparative advantage (Subair, & Oriogu, 2016; Irwin, 2017). He clarified that it is essential to domestic mobility of labour, which is the primordial and unique production factor. He argued that the necessary adjustments in mobility arise for an economy to obtain the benefits of trade liberalization. Based on this requirement and in the event of balance of commercial accounts, demonstrated that a country, even if you have absolute advantages in all goods produced by him, could have comparative advantages in certain more durable than other free trade conditions. Under these conditions, your trading partner, although devoid of absolute advantages, could have certain comparative advantages. Balistreri (2019) concluded that the gains from trade depend not only on the exchange of goods produced at lower costs, but also use more efficient and globally full production capacities available in the countries. To this end, each country should specialize in property in that it is more efficient, in relative terms, regardless of whether countries that are even more efficient in these same goods. In short, a country even without absolute advantages you can obtain profit and also provide other to its partners in free trade situation, specializing in accordance with the comparative advantages.

Regardless of its simplicity, the classical theory contains a fundamental message that trade induces the specialization process that can become economies more efficient mutually with highest standard of production and consumption. The key to these efficiency gains, which may include some temporary EG lies in the average increase overall productivity of countries. As emphasizes Pawar and Meymandpour (2017), “The simple Ricardo model remains useful for thinking about issues of host nation, such as the effects of technological progress on patterns of specialization and the distribution of gains from trade”. The job of the Ricardian model in the analysis of the facts can be very useful, although it requires caution. Absolute differences in size and absolute differences in productivity among economies can limit their specialization based on the advantages of international trade. May also lessen the intensity of this specialization other factors not included in general in the traditional theories, such as transportation costs and imperfections that hinder domestic mobility of production factors, in addition to their own trade barriers. Such factors and asymmetries between the economies may lead to partial specialization, with a tendency to more specialization in certain countries than in others. This is why we find countries producing a wider variety of goods than others. The trend toward specialization is driven by trade and by opening that induces, but these are not sufficient conditions to change the structure of economies.

Neoclassical theories of trade succeed in demonstrating that international trade is the result of separate appropriations of production factors between the countries. The neoclassical theories of trade were originally developed in articles of Zhou, Biswas, and Saunders (2019) formalized definitively by Liang (2017). Designed for the systems of two economies, two goods and two production factors, the Heckscher-Ohlin models were largely extended and generalized to multiple goods and factors, since (Simas, Wood, & Hertwich, 2015). Neoclassical theories differ from classical theory in the formulation of comparative advantages. In classical theory, such advantages originate from technological differences or, more precisely, of labour productivity. Within the framework of neoclassical theories, resulting from differences in allocation or relative abundance of factors. The neoclassical theories fail to take a production factor, as in the Ricardian model, and they take two or more factors of production. The Cobb-Douglas production function, which enforces inter-sectorial differences and allocation of income distribution in the countries.

3. Model Specification

The fundamental objective of the calculation of productivity is to identify the production variation that cannot be attributed to the change in the quantities of inputs. In available literature, the majority of studies used the Cobb-Douglas production function framework to analyze the EG in different economies.

In simple words, the Cobb-Douglas function claims that the production capacity of any economy is based on
the availability of physical capital ($K$) and labor force ($L$) of that economy. Furthermore, there are some additional variables (especially technology) which contribute in the production of that economy which represents through $A$. In this study, we use the following simple form Neo-Classical growth model by using the Cobb-Douglas production function framework to investigate the relationship between foreign capital inflows and EG:

$$Y = f (L, K, A) \ldots (1)$$

Where $Y$ is the real gross domestic product or per capita income, $L$ is the labor force, $K$ is the capital stock and $A$ is the total factor productivity. It is assumed that impact of foreign capital inflows on EG operates through $A$. This study is using four major items of foreign capital inflows, which play a major role in the economic development namely; foreign direct investment, workers' remittances, external public debt and exports of goods and services. These four items are the main sources of foreign capital inflows for the countries. In the remaining paragraphs of this section, we discuss those studies which use the Cobb-Douglas function to analyze the relationship between FCI and EG.

In past studies, there are several researches use Cobb-Douglas production function framework to analyze the impact of FDI on EG. For instance, Barrell and Pain (1997) argue that FDI brings diffusion of ideas and provide new and innovated production ways to improve the production process and the goods and services of both MNCs and local firms. Balasubramanyam, Salisu, and Sapsford (1999) analyze the relationship between FDI and EG and conclude that FDI has an important influence over growth performance of the economies. Akinlo (2004) argue that the FDI does not have a significant influence over EG. The results confirm that the attractive foreign direct investment is not a growth enhancing. Marwah and Tavakoli (2004) also use the Cobb-Douglas production function framework and confirm the positive impact of FDI on EG.

Choong, Baharumshah, Yusop, and Habibullah (2010) and Hermes and Lensink (2003) claims that the positive externalities of FDI on EG is higher in financially developed economies as compare to less financed developed economies. Anwar and Sun (2011) conclude that the positive influence of FDI on EG is based on the openness of the economy and its real effective exchange rate. Omri and Kahouli (2014) also use the Cobb-Douglas function to analyze the relationship between FDI and EG by using the panel data of 65 countries from the period of 1990-2011. Results conclude the bi-directional causal relationship between FDI and EG. In the recent case of Tunisia, Belloumi (2014) conclude the insignificant relationship between FDI and EG after using the Cobb-Douglas function.

The above discussion confirm that the several recent studies have used the Cobb-Douglas production function frame work to analyze the relationship between foreign capital inflows and EG. We use the log linear growth model to determine the models of EG. Therefore, the models for empirical estimation based on Cobb-Douglas function is developed as follow

$$GDP_{it} = \alpha_0 + \alpha_1 LabF_{it} + \alpha_2 Capital_{it} + \alpha_3 GovEx_{it} + \alpha_4 HCl_{it} + \alpha_5 Inflation_{it}$$

$$GDP_{it} = \alpha_0 + \alpha_1 LabF_{it} + \alpha_2 Capital_{it} + \alpha_3 GovEx_{it} + \alpha_4 HCl_{it} + \alpha_5 Inflation_{it}$$

$$GDP_{it} = \alpha_0 + \alpha_1 LabF_{it} + \alpha_2 Capital_{it} + \alpha_3 GovEx_{it} + \alpha_4 HCl_{it} + \alpha_5 Inflation_{it}$$

$$GDP_{it} = \alpha_0 + \alpha_1 LabF_{it} + \alpha_2 Capital_{it} + \alpha_3 GovEx_{it} + \alpha_4 HCl_{it} + \alpha_5 Inflation_{it}$$

$$GDP_{it} = \alpha_0 + \alpha_1 LabF_{it} + \alpha_2 Capital_{it} + \alpha_3 GovEx_{it} + \alpha_4 HCl_{it} + \alpha_5 Inflation_{it}$$

Whereas $\varepsilon_{it}$ is the error term. GDP is a real gross domestic product, $LabF_{it}$ is the total labor force and $Capital_{it}$ represents the capital stock which is measured by real gross fixed capital formation, $FDI_{it}$ represents the real foreign direct investment, $REMI_{it}$ represents the real amount of workers' remittances, $Exdebt_{it}$ represents the real value of external debts and $GovEx_{it}$ represents the real value of exports of goods and services, $GovEx_{it}$
is a real government consumption expenditure, and $HCl_{it}$ proxy of human capital which is measured by number of higher education enrollment.

$$GDP_{it} = \alpha_0 + \alpha_1 Lab_{it} + \alpha_2 Capital_{it} + \alpha_3 GovEx_{it} + \alpha_4 HCl_{it} + \alpha_5 Inflation_{it} + \alpha_6 FDI_{it} + \alpha_7 CRNC_{it} + \alpha_8 (CRNC \times FDI)_{it} + \epsilon_{it} \ldots \ldots \ldots (6)$$

$$GDP_{it} = \alpha_0 + \alpha_1 Lab_{it} + \alpha_2 Capital_{it} + \alpha_3 GovEx_{it} + \alpha_4 HCl_{it} + \alpha_5 Inflation_{it} + \alpha_6 REMI_{it} + \alpha_7 CRNC_{it} + \alpha_8 (CRNC \times REMI)_{it} + \epsilon_{it} \ldots \ldots \ldots (7)$$

$$GDP_{it} = \alpha_0 + \alpha_1 Lab_{it} + \alpha_2 Capital_{it} + \alpha_3 GovEx_{it} + \alpha_4 HCl_{it} + \alpha_5 Inflation_{it} + \alpha_6 Exdebt_{it} + \alpha_7 CRNC_{it} + \alpha_8 (CRNC \times Exdebt)_{it} + \epsilon_{it} \ldots \ldots \ldots (8)$$

$$GDP_{it} = \alpha_0 + \alpha_1 Lab_{it} + \alpha_2 Capital_{it} + \alpha_3 GovEx_{it} + \alpha_4 HCl_{it} + \alpha_5 Inflation_{it} + \alpha_6 Export_{it} + \alpha_7 CRNC_{it} + \alpha_8 (CRNC \times Export)_{it} + \epsilon_{it} \ldots \ldots \ldots (9)$$

Whereas $(CRNC \times FDI)_{it}$, $(CRNC \times REMI)_{it}$, $\alpha_8 (CRNC \times Exdebt)_{it}$, and $(CRNC \times Export)_{it}$ are respectively the interaction terms of foreign direct investment, workers’ remittances, external debt, and exports of goods and services with currency crises. The model to investigate the impact of foreign capital inflows on EG in the presence of banking crises is estimated by using the following framework

4. Regression Results

During the estimation exercise, we conducted a number of tests that included the Redundant Fixed Effects test and Hausman test. For instance, the Redundant Fixed Effects test was conducted to test the hypothesis that time-specific effects are present in the time series and cross section data. This test enables us to determine if the pooled Ordinary Least Squares (OLS) estimation is appropriate or not and whether one should use the FE/RE estimation. Similarly, the Hausman test was performed to determine if the RE estimates are correct and preferred to the FE and GMM estimates (Basheer et al., 2018; bin Hidthiir et al., 2019). The data of ASEAN countries over the period of 32 years from 1982 to 2017 is gathered from the official forums

The fixed effect regression results of the model 2-8 are explained in the table 1, table 2 and table 3. The findings of the study are showing consistency with the prior finds. The government expenses and inflation appeared in a negative but significant relationship with saving of ASEAN countries.

Table 1. Regression results of fixed effect estimates (equation 2-5)

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>$GDP$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lab</td>
<td>0.177***</td>
<td>0.135**</td>
<td>0.089**</td>
<td>0.213***</td>
</tr>
<tr>
<td>Capital</td>
<td>0.198**</td>
<td>0.154**</td>
<td>0.170**</td>
<td>0.239**</td>
</tr>
<tr>
<td>GovEx</td>
<td>-0.254**</td>
<td>-0.0238**</td>
<td>-0.243*</td>
<td>-0.321*</td>
</tr>
<tr>
<td>HCl</td>
<td>0.222</td>
<td>0.313*</td>
<td>0.284*</td>
<td>0.244*</td>
</tr>
<tr>
<td>Inflation</td>
<td>-0.797**</td>
<td>-0.0488*</td>
<td>-0.633*</td>
<td>-0.293*</td>
</tr>
<tr>
<td>FDI</td>
<td>0.219**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>REMI</td>
<td></td>
<td>0.231**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exdebt</td>
<td></td>
<td></td>
<td>0.234*</td>
<td></td>
</tr>
<tr>
<td>Export</td>
<td></td>
<td></td>
<td></td>
<td>0.816**</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.740</td>
<td>0.518</td>
<td>0.616</td>
<td>0.821</td>
</tr>
</tbody>
</table>

The moderating effect of the currency crisis is shown in table 3. The findings confirm that the currency crisis has significant negative impact on the EG as well it negatively moderates the relationship between key economic indicators and EG.
Table 2. Regression results of fixed effect estimates (equation 3-9)

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>Model 6</th>
<th>Model 7</th>
<th>Model 8</th>
<th>Model 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab</td>
<td>0.237***</td>
<td>0.135</td>
<td>0.0089</td>
<td>0.0089</td>
</tr>
<tr>
<td>Capital</td>
<td>0.298**</td>
<td>0.214</td>
<td>0.0170</td>
<td>0.0170</td>
</tr>
<tr>
<td>GovEx</td>
<td>-0.354**</td>
<td>-0.271</td>
<td>-0.0243*</td>
<td>-0.0243*</td>
</tr>
<tr>
<td>HCI</td>
<td>0.422</td>
<td>0.293*</td>
<td>0.0284*</td>
<td>0.0284*</td>
</tr>
<tr>
<td>Inflation</td>
<td>-0.297**</td>
<td>-0.290*</td>
<td>-0.0633*</td>
<td>-0.0633*</td>
</tr>
<tr>
<td>FDI</td>
<td>0.798**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>REMI</td>
<td>0.238</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exdebt</td>
<td>0.0284*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Export</td>
<td></td>
<td>0.876**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CRNC</td>
<td>-0.124*</td>
<td>-0.218**</td>
<td>-0.218**</td>
<td>-0.218***</td>
</tr>
<tr>
<td>CRNC*FDI</td>
<td>0.0198**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CRNC*REMI</td>
<td>-0.0238</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CRNC*Exdebt</td>
<td></td>
<td>0.0284*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CRNC*Export</td>
<td></td>
<td></td>
<td>0.876**</td>
<td></td>
</tr>
<tr>
<td>( R^2 )</td>
<td>0.921</td>
<td>0.523</td>
<td>0.821</td>
<td>0.871</td>
</tr>
</tbody>
</table>

Dynamic linear panel data models include \( q \) lags of the dependent variable as independent variables in estimating the relationship of interest. In their generic form, dynamic panel data models are presented as:

\[
Y_{it} = \sum_{j=1}^{q} y_{j} Y_{it-j} + X_{it} \beta_1 + Z_{it} \beta_2 + V_{i} + \varepsilon_{it} \quad (10)
\]

Developed by Blundell and Bond (1998), system GMM uses additional moment conditions to serve as an improvement in terms of performance of estimators in the models developed in Arellano and Bond (1991). System GMM estimator can appropriately country-specific unobserved effects in a situation where the lagged dependent variable is included in a model as a regressor. In addition to handling country-specific unobserved effect, system GMM offers a number of advantages over other static and dynamic panel data estimation techniques. For instance, according to Wooldridge (2002) GMM has the capacity to efficiently take good account of twin problems of serial correlation and heteroskedasticity. Moreover, in the view of Baum, Schaffer, and Stillman (2003), GMM has the advantage of ensuring consistency in the parameter estimates even in the presence of arbitrary heteroskedasticity. Finally, the study is not the first to employ panel GMM in estimating convergence. Studies that employed panel GMM include Weeks and Yudong Yao (2003). In the words of Nikoloski (2010), .The general data generating process of system GMM is given by Equation

\[
Y_{it} = \alpha Y_{i,t-1} + \xi \beta_1 + \varepsilon_{it} \quad \ldots (10)
\]

\[
e_{it} = u_{it} + v_{it} \quad \ldots (11)
\]

\[
E[\mu] = E[v_{it}] = E[\mu_{i} v_{it}] \ldots (11)
\]

In Equation [11], the error term has two orthogonal components – fixed effects, \( \mu_i \), and the idiosyncratic shocks, \( v_{it} \). System GMM estimators overtakes differenced GMM estimator by introducing additional moment condition. The additional moment condition is given by Equation [12].

\[
E(\Delta y_{i,t-s}[\alpha_i + u_{it}]) = 0 \ldots (12)
\]

for all values of \( i, t \) and \( s = 1, \ldots, \infty \).
Table 3. Regression results of GMM estimates (equation 2-6)

The results reported in table 4 has confirmed that findings of the fixed effect and currency crisis has appeared as significant moderator.

Table 4. Regression results of GMM estimates (equation 6-9)
The results suggest that the exports of the country have significant positive impact on EG. Moreover, the banking and systemic crisis hurt the relationship between EXP and EG. The results suggest that the FDI inflow of the country has significant positive impact on EG. Moreover, the banking and systemic crisis hurt the relationship between FDI and EG. It is recommended that at the time of crisis, government should play the role to minimize the negative impact of crisis by acting as a stabilizer for the foreign investors.

5. Conclusion

The results suggest that the flow of workers’ remittances in the country has significant positive impact on EG. Moreover, the banking and systemic crisis hurt the relationship between REM and EG. Worker remittances are considered as a boon to the countries. It has a positive association with the EG and acts a stabilizer during the financial crisis. To ensure the effective inflows of the remittance the government should encourage that remittance should be transferred through formal channels, this can be done by giving cost effective financial services to the remitter, linking the remittance transfer with mobile networks and banks that charge low prices. The remittance transfer through formal channels increases the foreign currency reserves and at the time of financial crisis, these reserves can be used to maintain the macroeconomic stability, to minimize the effect of negative shocks and help to boost the EG. Moreover, during the financial crisis, it also lessens credit constraints faced by the country.

The government authorities should also use the remittance inflows in a productive manner which results in creating employment opportunities. For this, the government should encourage tax exempted projects, establish new business in different sectors, and give incentives on investment, as this will encourage the remitter to invest the money and results in increased remittance inflows. Moreover, the authorities should develop policies that encourage international migration and use the remittances in promoting domestic production.

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INSIGHTS INTO THE EXTERNAL DEBT, CORRUPTION AND ECONOMIC GROWTH NEXUS: A CASE STUDY

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Abstract. This study basically examines the relationship between government external debt, corruption, and ECNG in selected five ASEAN countries, by estimating the magnitude and direction of the regression relationship, as well as the causal relationship. In addition, as a contribution in the direction of government and economic policymakers, this study intends to proffer recommendations as to the efficient management of public resources, in order to cushion the adverse effects of external indebtedness on other macroeconomic variables and welfare standards. Such effects include high cost of servicing, corruption, and capital flight, considering that investors fear being highly taxed when debts get to a certain level by the government. The findings of the study have revealed the fact that the negative results on the economy, there is need for addressing the threat of increasing debt by the government through using alternative sources of capital investment. This can include economy openness for capital and relaxing the import restrictions and increased valuable exports. Investment can be increased in the domestic economy and wealth can be created through realizing the in-tax revenue from capital imported, which is against the interest payment on external debt. Moreover, the investment can increase ECNG, which results in transfer of technology to the domestic economy increasing the probability of more employment opportunities.

Keywords: external debt; corruption


JEL Classifications: H6, D73

1. Background

The aspiration of every economy is to translate the periodical growth to development, since the growth of an economy is a sine-qua-non for economic development (Mikail & Zainol 2018; Haseeb, Kot, Hussain, & Jermsittiparsert, 2019; Kasayanond, Umam, & Jermsittiparsert, 2019; Zeibote et al., 2019; Prakash, Garg, 2019; Baltgailis 2019). In the quest for this development through stable growth in economic activities, a country usually supplements domestic resources with external finances. This may be in the form of loans, grants, and remittance; among others. Besides, the burdens of heavy debts, corruption, and declining growth have gone a long way in undermining economic recovery and stabilization efforts, alongside their devastating effects on ASEAN economy, being the continent with the highest debts and highest dependence on aid/grants in the world. Similarly, the experience of debt in the ASEAN countries in particular, and Asia in general has revealed that human and physical capital is being used on debt servicing. The supposed efforts of the Bretton-Woods Institutions (IMF & World Bank) to cushion the effects of debts on debtor nations have largely compounded the amount and burden of debts; and the debt-rescheduling initiatives of these institutions have also enhanced more debts...
in attempts to repay old loans; thus debts are being used for debts and interests on these debts keep compounding. In fact, despite the years of various policy initiatives, the market and economic changes instigated by these institutions have not resulted in any tangible improvement in welfare standard and poverty reduction. Part of the reasons for the continued rise in external debts in the ASEAN (and Asia) countries has been the failure of IMF, World Bank and other creditor agencies to consider both the economic and non-economic environments of these countries while advancing loans to them. Such environments include, among others, the exchange rates devaluation, political unrest, and the volatility of primary commodity prices, which are part of the major challenges in the ASEAN countries, as evident from their continued increase in external indebtedness and slowing economic growth (ECNG).

The level of corruption and resources mismanagement, which is a common characteristic in the ASEAN countries, has gone a long way in weakening virtually all economic institutions, including social and political institutions; with the resultant effect of undermining equity, fairness, efficiency and transparency, thereby preventing the emergence of well-performing government and social structures (Jermittiparsert, Sriyakul, & Pamornmast, 2012; Malik & Khan 2013; Jermittiparsert, Sriyakul, & Rodoonsong, 2013). In most of these countries, these rent-seeking activities have almost become a daily routine, commonplace, and are such institutionalized that they have been tagged these countries’ second nature. Here it has to be noted that similar issues are characteristic and for other countries (e.g. Luzgina, A. 2017; Osipov et al. 2018).

There is no doubt in the fact that a moderate and well productive level of debt is desirable for sustained ECNG. In fact, the issue of debts might not have been such debatable in the concerned countries if there had been experiences of their proper channel into productive economic activities (given that effective debt management is essential for ECNG). However, as part of the effects of resources mismanagement which has become pronounced in the ASEAN countries, attempts to obtain loans have been largely opposed by citizens and activists, and its adverse effects have been largely felt. This occurs alongside the severe deficits in current accounts balances, in addition to low level of savings and declining balance of payments, rising public spending, as well as increased prices of imports (being countries that largely depend on imported products and services). All these factors, among others, result in increased external debt (Buthelezi & Nyatanga, 2018; Mabika, 2016; Korkmaz, 2015) as cited in Abdullahi, Hassan, and Bakar (2016). Alternatively, even as investment in infrastructure and public capital largely promotes ECNG, lack of adequate savings, and borrowing in anticipation of revenues may expose the economy.

This study basically examines the relationship between government external debt, corruption, and ECNG in selected five ASEAN countries, by estimating the magnitude and direction of the regression relationship, as well as the causal relationship. In addition, as a contribution in the direction of government and economic policymakers, this study intends to proffer recommendations as to the efficient management of public resources, in order to cushion the adverse effects of external indebtedness on other macroeconomic variables and welfare standards. Such effects include high cost of servicing, corruption, and capital flight, considering that investors fear being highly taxed when debts get to a certain level by the government.

2. Literature Review

2.1. External Debt and ECNG

Many researchers hold on to the view that a high level of debt has adverse effects on ECNG (Megersa, 2015; Loukil, 2017; Whajah, Bokpin, & Kuttu, 2019), even as the ECNG theorists support the borrowing by poor countries in a bid to complement domestic resources and finance growth and development (Manaf & Ibrahim 2017; Popov, 2018). The attainment of the target growth rate requires foreign assistance, especially in developing and ASEAN countries where the level of domestic savings and investment are relatively low. The theory regards external finance as a way by which any development gap could be filled in order to achieve the target growth rate of the economy.
In the areas of external finance, including external indebtedness, there have been large claims that assistance from the donor countries dispatched to the low-income countries likely follows the formers’ political and strategic importance, and not based on the needs of the countries. Mustafa, Elshakh, and Mustafa (2018) claims that foreign assistance has some distorting outcomes on the recipient countries’ political system; and leads these economies into making inappropriate economic policies, such as the limit on the inflow of private capital, enhancement of rent-seeking activities, as well as pricing systems that tend to retard the growth of other primary sectors (such as agriculture). According to Çiftçioğlu and Sokhanvar (2018), the requirement for debt service has a tendency to reduce available funds for investment and therefore hindering the attainment of the target growth rate.

In the works of Kaur (2019), the vulnerability of debt service in developing countries is explained by the size of external loans, which has been much larger than equity finance, thereby resulting in debt-equity imbalance; the ratio of debts at floating interest rates which has risen dramatically to the extent that borrowers are directly affected upon the rise in interest rates; and the fact that the maturities of debts have largely shortened as a result of declining share of official flows. As argued by S. W. Olawale (2017), the effective management of debt management is important in an increasingly complex financial environment. Therefore, he contends that the crucial elements of debt management are the effective regulatory environment, policy co-ordination, as well as a system of accountability. Similarly, the level of debts that is development driven largely relies on the adoption and implementation of fiscal adjustment and structural reforms by the borrowing countries. These include, among others, the stemming of corruption, transparency and high level of accountability in public service, as well as improved debt management structures.

The increase in the burden of debt service beyond capacity, occasioned by expansion in external debt, requires that the situation be substituted through expansion in exports; unless increased borrowings will be required for debt servicing, while external debt keeps increasing beyond sustainable threshold. The inability of the country to realize the required revenue necessary to meet the repayments obligations further compound the debt problem (Marshal, 2017; Mahmud, 2018). This is supported by Stone (2019), who is of the view that the adverse effect of both external and domestic debts on ECNG is through their likelihood of compounding an economy’s debt stock and interest payments, with the resultant effect of crowding-out both public and private investment, alongside its adverse effect on domestic currency occasioned by the inflow of foreign currency through external debt.

By observing the ECNG and external debt relationship, it is expected that effective utilization of debts will increase the amount of government capital that can be invested in infrastructure, thereby resulting in the increase of domestic economic activities and investments. Contrarily, the past experiences of third-world economies have shown that large part of external and domestic debts were used for the basic infrastructure development, in order to improve growth and to attract investment and have not been utilized for the judicious purposes. Eberhardt and Presbitero (2015) conducted a research for analyzing long-run growth and public debt, by using a data for 118 economies, for a period of 1961-2012. These countries include 36 high-income economies, 33 upper-middle income economies, 27 lower middle-income economies, and 22 low-income economies and employed standard non-linear (expressing non-linearity by including a square of a debt stock term) and linear regression models, and common correlated effect (CCE) and common correlated effect mean group (CMG) as the statistical techniques for estimation. The results indicated a significant positive long-run relationship among GDP and debts, whereas, for each estimation technique, significant but negative error correction terms were obtained having values of less than one. These findings are consistent with Siddique, Selvanathan, and Selvanathan (2015). For the short term relationship, mean group estimator was used and reported a significant negative coefficient of debt, indicating that there exists a negative relationship among GDP and debt.

However, Megersa (2015) and Chiu and Lee (2017) have reported positive value for the debt coefficient. Thus, in order to analyze the debt-growth relationship and Laffer curve for 22-low income ASEAN economies, for the years 1990-2011, Megersa (2015) employed a pooled OLS estimation method and concluded that debt significantly affect ECNG and has positive impact up to a certain point. In another study, Olawale and Has-
san (2016) have pointed out positive relationship of GDP with external debt and interest on external debt, and also suggested that up to a certain point external debt positively contributes to the GDP, and after that level it starts to negatively contribute to the GDP, through its non-linear effect. Furthermore, another study Chiu and Lee (2017) examined how ECNG in Six Pacific Island economies is affected with external debt, during 1988-2004, and reported that higher debts stimulate ECNG (Chitra et al., 2018; David et al., 2018). This study also observed that the short run causal relationship exists from external debt to ECNG. In a similar vein, the external debt-growth linkage in Malaysia is analyzed by S. W. Olawale (2017), by using an autoregressive distributed lag model (ARDL) for the years, 1991Q1-2009Q4. The study reported that external debt accumulation is found to be positively related to the optimum ECNG level in Malaysia, however, any further increase in external debt above this level would result in its inverse contribution to the Malaysian ECNG. The results indicated a positive and a negative coefficient of interest on the Malaysian external debt.

Contrarily, the results obtained for the static non-linear and linear models, using CMG and MG estimators have shown a significant negative relation among debt coefficient and GDP (Eberhardt & Presbitero, 2015; Lari, NYangweso & Rono 2017), which is consistent with the Megersa (2015) findings, who also found negative coefficients for both estimated debt and debt square. Furthermore, in a study to estimate the non-linear and linear effects of external debt on the Nigeria’s ECNG, for the period 1975-2005, Olawale and Hassan (2016) used generalized least square (GLS) and Ordinary least squares (OLS) techniques. They found that interest on external debt and external debt are significantly as well as negatively related to ECNG. Similar findings were obtained in their study, they attempted to examine the effects of government and debt size on the country’s ECNG. For this purpose, they incorporated the data for 175 economies during 1997-2008, and used traditional fixed and random effects models for the statistical estimation.

Researcher also conducted a research by taking a sample of heavily-indebted poor countries (HIPCs), for the time period 1970-2007, using Mean group (MG), dynamic fixed effect (DFE) and pooled mean group (PMG) techniques for the empirical estimation. The results indicated significant negative coefficients, both in short and long-run for external debt in terms of ECNG. Abdullahi et al. (2016) also found significant negative short run and long run relationship of each external debt service and external debt coefficient for capital formation, at 5% level of significance. This study used the data for 1980-2013 by using an ARDL approach to assess the ECNG and external debt relationship, taking capital formation as the dependent variable. Similarly, Senadza, Fiagbe, and Quartey (2017) also studied the case of 35 ASEAN economies in order to assess that how external debt has affected the ECNG of these countries during 1980-1990, by employing OLS estimation technique. He concluded that ECNG is found to be negatively influenced by net outstanding debt, therefore, it signifies that level of investment and external debt are negatively correlated with each other.

2.2. Corruption and ECNG

Some economic researchers, such as Huang (2016) and Mbaku (2019) have argued in favor of corruption as an enhancing factor of economic exchange, as they claim it helps to overcome some cumbersome regulations. This, in their arguments, explains that corruption positively influences ECNG as the productivity of labor is assumed to rise with illegal incentives to economic agents in order to speed up their activities. In addition, they suggested that corporations or individuals may involve in bribing the policy makers to avoid unfavorable circumstances that are either created due to political inflexibilities or by the regulations and laws imposed by law enforcement agencies, which result in the improvement of economic efficiency. A few researchers have argued that an optimum corruption level exists while an economy tends to achieve national output maximization (Huang, 2016; Khan, 2018). Even if the corruption level is relatively low, the anti-corruption efforts also involve some cost. Several economies achieve rapid ECNG even in the existence of corruption. This is in contrast to Bardhan (2018) view, who argued that corruption is likely to have a negative impact on growth, however, his view has been based upon historical experience instead of modern empirical research. In a similar scholar also reported adverse effects of corruption on growth, these effects include discouraging FDI, reduction in domestic investment, distortions in the composition of government expenses, and promoting government overspending. This is in consistent with Ivanyna, Moumouras, and Rangazas (2016) statement that corruption majorly affect growth by causing its effects on investment.
Huang (2016) also examined the whether corruption cause negative effects on ECNG, by using panel data for 13 Asian-Pacific economies during 1997-2013, and employed a Granger causality approach for assessing heterogeneity and cross-sectional dependence across countries. The study found significant positive causality for South Korea i.e. from corruption to ECNG, and significant positive causality for China i.e. from ECNG to corruption. In this study, the researcher did not reinforce the idea that corruption is harmful for the ECNG, rather supported the idea of ‘grease the wheels’ for the corruption-ECNG relationship in South Korea, because the anti-corruption policies of the government may seem to be ineffective in promoting economic development. The study also suggested that the increase in ECNG is found to promote the level of corruption in China. In a study by Coupet (2018), a significant positive association is found among ECNG and corruption in OECD countries, during 1960-1989, using an OLS estimation technique. According to Coupet this positive relationship may be obtained because opportunity cost is involved in eradicating corruption, for instance, when a developing economy use its existing resources towards the detection as well as for the prevention of corruption activities, the relationship comes out to be positive, but with the diminishing returns.

These findings do not coincide with the Lazreg and Mohammed (2019) study on economic development and corruption, in which Two-stage least square and OLS techniques were employed for analyzing the empirical evidence of their linkage, during 1970-1995. It is obtained that one unit increase in corruption lowers the productivity by 2-4% of GDP, and 0.5% of GDP decline in net annual capital inflows. In another study, Kaplan and Akçoraoğlu (2017) observed 41 empirical researches including 460 estimates, with an attempt to analyze how corruption influence growth and concluded that even if the trade openness and institutions are considered or not, using fixed effects and authors affiliation may tend to minimize corruption’s negative effects on the ECNG but not completely eliminate these effects. Similarly, Gründler and Potrafke (2019) also attempted to observe direct effects caused by corruption on ECNG, by examining 327 estimates from 29 primary researches. The study reported heterogeneous findings due to difference in sample periods, country coverage, and difference in measures used for corruption, and estimation techniques, thus obtained negative impact in primary studies. In case of non-OECD and non-oil countries, author found that corruption negates the welfare standard of a society through its influence on the level of investment and ECNG, since significant negative association is obtained for ECNG and corruption. Also a significant negative association is found between the square of corruption and ECNG, which implies that a significant negative non-linear association exists among output per worker and corruption in OECD countries. These results are obtained by employing non-linear and linear OLS estimation. Lambsdorff (2015) study results can be used for assessing that what effects control of corruption may have on external debt and ECNG. The control of corruption is taken as the ‘absence of corruption’, thus, for all countries such as non-oil, non-OECD, and OECD countries, a significant positive relationship is obtained for average net annual capital inflows (to the GDP ratio) and absence of corruption, during 1970-1995, by employing TSLS and OLS techniques for estimation. With TSLS technique, the coefficient for government stability with respect to net annual capital inflows is also found to be the same. Thereby implying that popular support for government, higher government unity and strong legislative power are highly critical for achieving productivity and ECNG.

2.3. Hollis Chenery’s Two-Gap Theory

Chenery and Strout (1966) have put forward, the two-gap approach to economic development. The basic idea is that foreign exchange and savings gaps are two separate and independent constraints to attaining the target growth rate in less developed countries (LDCs). Thus, they see external finance as a way by which these two gaps may be filled in order to achieve the target growth rate of the economy. Specifically, the authors identified that to achieve the target growth rate, an economy is required to supplement domestic resources with external finance, which may be in the forms of grants, remittance or debt.

This model is an extension of the popular Domar (1946), and Harrod (1939) model, down from Keynes (1929) the Neo-classical model. The pre-conditions for ECNG were identified such that the Savings Gap arises when the domestic savings isless than the investment required to achieve the target growth rate. For instance, if the growth target of national real income is 6 percent, and the capital-output ratio is 3:1, then the economy must save 18 percent of its national income to achieve this growth rate. On the other hand, inadequate foreign ex-
change, which may arise from lower export values relative to import values, results in a fall in the stock of foreign exchange. This is known as the *Foreign Exchange Gap*. Offsetting these two gaps, therefore, requires the inflow of *foreign aids*, which may be in the form of grants, remittances, loans and/or any other form of foreign debts or assistance (Bruno & Chenery, 1962). Hence, such external finance supplements the available domestic resources and brings the *two-gap* model into play. The model assumes that developing economies are likely to face foreign exchange constraints or are short of domestic savings. This model assumes that the nature of foreign-exchange gap and savings gap independent and are different in magnitude, which implies that at any point one of these gaps are dominant than the other, for any developed economy (Todaro & Smith, 2004). Assuming a fundamental macroeconomic identity in which the aggregate output equals the aggregate expenditure ($Y=AE$), such that $Y = C + I + (X - M)$, where: $Y =$ national income; $C =$ consumption; $I =$ investment (or domestic capital formation); $X =$ exports; and $M =$ imports. By subtracting $C$ from both sides, the resulting equation is: $Y – C = I + (X - M)$; where $(Y – C) = S$ (domestic savings). Thus, these two constitute the two separate constraints, and the elimination of one does not get rid of the other.

Since it is assumed that domestic investment can be financed through domestic savings and through the inflows of capital ($F$), where $F = M – X$, the equation may be presented as $F = I – S$ (or $I = F + S$). However, too small savings lower than the level acceptable for the country to make investment, may create a savings gap. Similarly, too small exports for permitting the required level of imports to ensure efficient resource usage in the economy may also create a foreign exchange gap. The *two-gap* theory is adopted based on its relative importance in the analysis of capital flow. It useful for estimating the less-developed country’s capital requirement for growth; in terms of how much capital can be generated within the economy and the requirement through foreign sources, so as to achieve the target growth rate. In addition, it aids proper understanding of the extent to which foreign resources are required to fill the savings gap and foreign exchange gap in order to attain sustainable development. Also, the divergence between the two gaps highlights the role of external finance in economic development. If the *savings gap* exceeds the *foreign exchange gap*, it may be narrowed by the inflow of capital; and the foreign exchange gap between investment and savings will be bridged in the long-run, hence the *two-gap* model comes into play. Alternatively, if the *foreign exchange gap* exceeds the *savings gap*, external finance results in increased investment and, therefore, ECNG.

The Augmented Solow Growth model (1956) was adopted from Coupet Jr (2003) study, to investigate the corruption-economic growth relationship. Coupet Jr (2003) transformed this model to assess the corruption’s impact on a country’s level of productivity. Therefore, presuming an economy with particular focus on producing a single commodity using a Neo-classical production function.

$$ AGRI_t = K_t^\alpha H_t^\beta [LMP_t(\phi)Lab_t]^{1-\alpha-\beta}. \quad (1) $$

where: where $AGRI_t$ is the aggregate of the real income, $K_t^\alpha$ represents physical capital, $H_t$ is the level of human capital, $Lab_t$ is labor employed, $LMP_t$ is basically a multifactor of country’s productivity and $\phi$ is the level of corruption in a country; such that $LMP_t(\phi) < 0$.

Supposing that $0 < \alpha < 1, 0 < \beta < 1$ and $\alpha + \beta < 1$, the production function is assumed to exhibit a positive, yet diminishing marginal returns to labour and capital; [2]

$$ \frac{dK}{dt} = S_K AGRI_t - \phi_K K_t $$

and

$$ \frac{dH}{dt} = S_H AGRI_t - \phi_H H_t. \quad (2) $$

Where, $S_K, S_H, \phi_K$ and $\phi_H$ represent a set of exogenous parameters, indicating the allocation of income share in physical investment, human capital investment, and physical and human capital’s depreciation rates.
respectively. The total population is assumed to be determined exogenously and represented as \( \text{Lab}_t = \text{Lab}_0 e^{nt} = \text{Loent} \) keeping the population growth rate constant, during a specified period of time, i.e. \( \frac{d\text{Lab}_t}{dt} / \text{Lab}_t = n^2 \). Furthermore, when, \( A_t \) shows the multifactor productivity of an economy, \( \text{LMP}_t (\varphi) = \text{LMP}_t e^{-\varphi \theta} \). The corruption variable is added into the model, assuming it to be exogenous which may decline productivity of inputs, by taking the form of externalities effect in declining inputs quality. Firms which involve in bribery to evade fines, not only impose negative externalities upon other firms but also lead to the reduction in their level of investment. For instance, in an attempt of producing public goods through starting a new venture by a higher government official with an unqualified cronies, would result in the reduction of private sector productivity (Tanzi & Davoodi, 1998). Thus, \( \varphi \) and \( \theta \) represents the corruption parameters which jointly have their effects on the productivity of multiple factors. Moreover, \( \rho \) measures the overall corruption level in the economy and \( \varphi \) measures the corruption’s responsiveness to production function.

The following model is consistent with the modified Solow Growth Model and Two-Gap theory, as well as Eberhardt and Presbitero (2015) studies, thus, for the empirical analysis of the relationship among GDP, EXDBT, and CORR the model is specified as follows:

\[
\text{ECNG} = f(\text{EXTDBT} + \text{EXPORT} + \text{GCF} + \text{CORUP} + \text{DEBTIN}) \ldots (3)
\]

Based on the ECN functions, the econometrical can be finally specified model as follows:

\[
\text{ECNG}_{it} = \alpha_0 + \alpha_1 \text{EXTDBT}_{it} + \alpha_2 \text{EXPORT}_{it} + \alpha_3 \text{GCF}_{it} + \alpha_4 \text{CORUP}_{it} + \alpha_5 \text{DEBTIN}_{it} \ldots (4)
\]

\( \alpha \) is the parameter representing the intercept and slope coefficients; \( \epsilon_{it} \) is the stochastic term. The model examines the relationship between \( \text{EXTDBT} \) and \( \text{GDP} \) on one hand, and \( \text{ECNG} \) and \( \text{CORUP} \) on the other hand. This is to particularly measure how external debts affects the level of ECNG in ASEAN countries, and the extent and direction of the effect of corruption on the levels of productivity and output in the five countries.

3. Data

The current study used secondary sources of data and pooled both the time-series and the cross-sectional data for the purpose of this research. The data comprises of external debt stock (EXDBT), gross capital formation (GCF), gross domestic product (GDP), interest on external debt (DEBTIN), exports of goods and services (EXPRT), and corruption (CORR), for those ASEAN countries that are chosen for this research, during 1990-2015. For statistical analysis, the data for EXPRT, DEBTIN, GCF, and EXDBT are taken from the International Financial Statistics and Direction of Trade Statistics of IMF and from World Bank, whereas, the data for CORR is taken from the International Country Risk Guide (ICRG).

4. Panel Cointegration Test

The test of cointegration is next examined to determine the long-run relationship among the variables. There are many methods of testing the cointegration of the variables, such as Maddala and Wu (1999), and Pedroni (1999). This study employs the technique developed by Pedroni (1999), which allows for considerable heterogeneity and uses the residual estimates from the hypothesized long-run regression. The long-run relation is of the form:

\[
Y_{it} = \alpha_i + \delta_i t + \sum_{m=1}^{M} \beta_m X_{mi}, t + \epsilon_{it} \ldots (5)
\]

where \( t = 1, \ldots, T; i = 1, \ldots, N; \) and \( m = 1, \ldots, M; T \) represent total number of observations at a specified time, \( M \) represents the total number of regressors involved in this study and \( N \) shows number of cross-sections. Moreover, \( \alpha \) represents fixed effects parameters, which changes from one individual in cross-section data to the other; \( \delta \) represents the time trend, and the slope coefficient, involving time related effect.
In Equation [5], Yit represents the dependent variable (GDPit) and Xmi,t represent the regressors (EXTDBTit, EXPRTit, GCFit, CORURit, DEBTINit). In order to cover both the within and between effects (bin Hidthiir et al., 2019; Basheer et al., 2018), Pedroni (1999) developed seven distinct cointegration statistics which were classified into two, based on the Phillips-Perron and ADF tests panel versions; thus applying them to residuals from panel estimation.

When there exist co-integration relation, this refers to the existence of long term association between the variables. However, it does not provide a detailed knowledge about the causality direction. For analyzing the casual relation in the short run and long run between the variables, a two step method has been adopted in this study, which was referred by Engle and Granger (1987). The causality direction has been examined through this test between the macroeconomic variables incorporated in the research model. The causality between two variables, which have close association, is investigated through this method. It is tested in the null hypothesis that the variable X do not cause any variation in the variable Y, however, it can be interesting to analyze if the variable CORR is caused by GDP or GDP is caused by CORR. In explanation the causal relation runs from GDP→ CORR) or CORR →GDP. It is supposed in this study that the time series of the variables (ADF-statistics) and non-parametric (t-statistics) are considered reliable (Pedroni, 1999). In this regard, the Table 3 shows the results, which lead to the conclusion that there is a long term association between the variables.

\[
ECNG_{it} = \sum_{i=1}^{n} \beta_i EXTDB_{it-1} + \sum_{i=1}^{n} \beta_j ECNG_{it-1} + \varepsilon_{1it} \quad \ldots \ldots (6)
\]

\[
EXTDB_{it} = \sum_{i=1}^{n} \beta_i EXTDB_{it-1} + \sum_{i=1}^{n} \beta_j ECNG_{it-1} + \varepsilon_{2it} \quad \ldots \ldots (7)
\]

\[
ECNG_{it} = \sum_{i=1}^{n} \beta_i CORUP_{it-1} + \sum_{i=1}^{n} \beta_j ECNG_{it-1} + \varepsilon_{1it} \quad \ldots \ldots (8)
\]

\[
CORUP_{it} = \sum_{i=1}^{n} \beta_i CORUP_{it-1} + \sum_{i=1}^{n} \beta_j ECNG_{it-1} + \varepsilon_{2it} \quad \ldots \ldots (9)
\]

The null hypothesis is rejected at 5 percent significance level by the ADF, the panel and group t statistics, even the conditions are constant or constant plus trend. Therefore, the null hypothesis rejection is supported by most of the statistics, which reflects that there exists a long term association between the variables with reference to the ASEAN countries. In the conditions of constant or constant plus trend, the parametric (ADF-statistics) and non-parametric (t-statistics) are considered reliable (Pedroni, 1999). In this regard, the Table 3 shows the results, which lead to the conclusion that there is a long term association between the variables.
Dependent Variable: \( ECNG \) | Fixed Effect Coefficient (p-value)
---|---
EXDBT | \(-0.0177***\) (0.010)
EXPORT | 0.0198** (0.027)
GCF | 0.0254** (0.014)
CORUP | \(-0.1222***\) (0.006)
DEBTIN | 0.0797** (0.033)

\( R^2 \) | 0.740

**FMOLS Regression Results**

There is negative relation of EXDBT with the GDP and it is statistically significant at 5 percent. It is explained by the coefficient that the reduction in GDP is caused by USD .62 when there is increased in EXDBT by USD1. The result is consistent with the hypothesis of debt overhand. However, the ECNG and level of investment declines when there is continuous increase in the accumulation of debt. The researchers including Eberhardt and Presbitero (2015) and Senadza et al. (2017) have obtained similar results. These results can be applicable to the Asian countries, where the borrowings have not been used in the productive activities and mismanagement occurred. Resultantly, there is depletion in the existing productive capital for financing of debt obligations. This leads to the decrease in the ECNG and domestic level of investment. The threat of capital flight may increase by continuous debts. However, the probability of being charged by taxes can be anticipated by the investors to fulfill their debts obligations (Mejdoub, & Arab 2017). The capital repatriation can be considered in short term until there are improvements in the economic conditions. When the situation becomes favorable, the output of the economy is reduced.

In the similar way, it is reflected by the coefficient of DEBTIN that it is significant at 5% level and shows a negative association between GDP and DEBTIN. The increase in interest by USD1 leads to decline of USD2.30 in GDP. The interest can be increased by high servicing cost or accumulation. The results are consistent with the study of Mohd Dauda, Ahmad, and Azman-Saini (2013) and Abdullahi et al. (2016). It is implied that similar effect can be created on ECNG by interest payments imposed on such debts being external. The actual repayment on the debts maturity is compounded by interest payments.

<table>
<thead>
<tr>
<th>Excluded</th>
<th>Chi-sq</th>
<th>df</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXTDBT</td>
<td>34.651</td>
<td>2</td>
<td>0.000</td>
</tr>
<tr>
<td>EXPORT</td>
<td>20.219</td>
<td>2</td>
<td>0.000</td>
</tr>
<tr>
<td>GCF</td>
<td>78.236</td>
<td>2</td>
<td>0.000</td>
</tr>
<tr>
<td>CORUP</td>
<td>95.231</td>
<td>2</td>
<td>0.000</td>
</tr>
<tr>
<td>DEBTIN</td>
<td>7.234</td>
<td>2</td>
<td>0.000</td>
</tr>
<tr>
<td>All</td>
<td>235.571</td>
<td>10</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Equation 6

<table>
<thead>
<tr>
<th>Excluded</th>
<th>Chi-sq</th>
<th>df</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECNF</td>
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<tr>
<td>EXPORT</td>
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</tr>
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<td>GCF</td>
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<tr>
<td>CORUP</td>
<td>17.721</td>
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</tr>
<tr>
<td>DEBTIN</td>
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<td>2</td>
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</tr>
<tr>
<td>All</td>
<td>125.651</td>
<td>10</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Equation 7
Table 3 represents the results of causality direction between the variables of interest examined through granger causality test. It is explained by the results that the causality runs from GDP through EXTDBT. The causality runs from EXTDBT through GDP. This indicates a bi-directional relation of causality between the two variables. In each case, the value of probability is less than 5 percent. In the similar way, there is bi-directional causality relation between DEBTIN and EXTDBT. Uni-directional causality exists between CORR and DEBTIN, and DEBTIN and GDP. However, there is no evidence for direction of causality running from GDP to CORR. It shows that the variables CORR and GDP are independent of each other.

5. Conclusion

The findings of the study show that the relationship between external debt and ECNG is negative, thereby confirming the debt overhang theory of external debt. This theory upholds that a sustained increase in government borrowing has tendency to reduce investment and ECNG, in the event that investors are made to pay higher taxes in order to allow the servicing of government debt. Similarly, the interest on external debt is also found to be negatively related to ECNG, thereby implying the existence of negative relationship between the stock of external debt and ECNG. In the same way, while most of the studies obtained that corruption reduces the level of economic productivity, the finding of this study supports few theoretical and empirical studies, who uphold that corruption enhances economic productivity and growth. This suggests that some forms of corruption are required to avoid bureaucracy especially in public service, where ‘what belongs to all is seen to belong none’. Finally, the results of the panel granger causality show the evidence of bi-directional causality between ECNG and external debt, while no evidence of causality is found between corruption and ECNG. Considering the negative results on the economy, there is need for addressing the threat of increasing debt by the government through using alternative sources of capital investment. This can include economy openness for capital and relaxing the import restrictions and increased valuable exports. Investment can be increased in the domestic economy and wealth can be created through realizing the in tax revenue from capital imported, which is against the interest payment on external debt. Moreover, the investment can increase ECNG, which results in transfer of technology to the domestic economy increasing the probability of more employment opportunities.

In the similar way, the increase in corruption level among the ASEAN economies must be resolved. Inducements have been seen by the public services before the statutory performance as custom, which shows an uncontrollable corruption level. This causes severe influence on output as well. There is need for suitable policy in this aspect based on sincerity, integrity and severe penalties should be imposed on corruption act. Independent and credible actions should be conducted by different government agencies of anti-corruption. When illegal rewards and less penalty is involved in corruption, this attracts more corruption. The adverse influences of corruption must be expended with proper orientation to the new generations. In this way, they can be realized about corruption free acts in life.
References


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Abstract. The scientific paper identifies the leading processes of transnationalisation of the international labor market and the security factors of its existence. The degree of influence of direct foreign investments on the market of national labor resources was determined. The correlation relationship between the foreign investment and the creation of new workplaces in foreign divisions by TNC was studied. The segment security of the international labor market was studied under the influence of the formation of value chains in the environment of TNC.

Keywords: segment security; international labor market; outsourcing; employees of foreign affiliates of transnational corporations; employment effect; foreign direct investment; value chain


JEL Classifications: C10, M14

1. Introduction

The mobility of work places in the context of globalization is largely determined by the readiness of specific national economies to receive foreign financial or material capital. But even in the conditions of investment hunger, many states are not ready to fully open their national markets to foreign investors, or the multinational companies themselves do not risk implementing the full production cycle in the territory of the receiving countries. This creates a variety of forms of foreign presence in the economy of individual countries and regions of the world, as well as the variability of ways to create work places. The vast majority of transnational corporations (TNCs) entering foreign markets is associated with their desire to reduce the costs of the production process and obtain super-profits, primarily through the use of cheap labor from different segments of the global labor market, affecting its structure and safety. Complex issues of the functioning of the international labor market and the influence of TNCs on international production and labor processes are investigated by such scientists as (Barlett, Ghoshal, 2016; Guest, 2014; Huselid, 2015; Mathis, 2011; Pauly, Reich, 2016; Roberts, 2017; Smethurst, 2016; Truss, et. al., 2016; Torrington, et. al., 2012; Garbowski, M., Drobyazko, S., et. al., 2019; Dobrovolskienė et al., 2017; Nikitina et al., 2018; Tvaronavičienė, 2019; Lialina, 2019; Zeibote, et al. 2019).
The aim of the scientific paper is to study the strength of the value chains created by TNCs and investing in foreign affiliates in the international labor market segments and determining the safety status of their functioning.

2. Literature Survey

The motive for using cheaper labor is increasingly referred to the term “international outsourcing”, but not all actions of large companies on the transfer of production capacity (also work places) abroad should be interpreted as follows. In theoretical and methodological terms, the concepts of “international outsourcing” or “offshoring” and “foreign direct investment (FDI)” should be distinguished as processes that are closely related to the mobility of labor resources and the creation of new work places in individual national economies. In our opinion, the following classification of forms and mobility of work places is possible (Fig. 1).

In this particular case, mobility must be understood primarily as the creation of new work places in the countries receiving foreign investment (Kostova, Roth, 2013). In our opinion, two main forms of creating work places through transnationalisation should be distinguished: foreign direct investment and “independent commercial contracts” (international outsourcing), the choice of one of which depends on the goal of creating a business abroad, but always implies more favorable conditions in form of cost savings on labor costs (Gereffi, Fernandez-Stark, 2011a; Drobyazko, S., et. al., 2019; Shuyan, Fabuš, 2019; Shvetsova et al. 2018; Ahmed et al., 2018).

Within the framework of the above forms, it is possible to identify ways to create new jobs, which represent a mechanism for organizing production or providing services abroad. Within the framework of the first form, two main ways can be designated: horizontal and vertical FDI. In the second form - foreign collection, the production of final products or the production of intermediate products. Their choice within the framework of one form or another largely depends on the technological production and qualification of the local labor resources at the disposal of the owner.

As you know, TNC production activity combines a number of interrelated stages, which are organized in the form of a vertical chain that includes the production process itself, as well as activities for developing the product idea, purchasing resources and delivering it to the customer. It is this sequence of actions in the economic literature that is called the value-added chain (VAC), where each link adds a certain value to the originally used resources (Gereffi, Fernandez-Stark, 2011b; Reznik, O., et.al., 2019).

![Figure 1](https://example.com/figure1.png)

**Fig 1.** Forms and methods of work places mobility in countries receiving foreign investment

*Source: Designed by the authors*
When it comes to cross-border value chains, the concept of production fragmentation comes to the fore. Global value chains mean that firms place individual links in different geographic locations, often in different countries and regions. They find it profitable to place separate stages of the production process in the territories that can offer the most effective implementation of certain production tasks. Now, value chains are usually built as follows: low-cost production and collection are located in countries with markets (in China and other countries of Southeast Asia) that are developing, and final consumers are in Europe, North America and in Asia (Gereffi, Fernandez-Stark, 2011b).

Thus, international supply chains can be organized both within the same TNC and through contractual agreements with other companies. For example, US statistics still takes into account the number of jobs transferred abroad in two directions: intra-company channels or the conclusion of contracts with third-party organizations.

Both forms of making production abroad satisfy the “placement benefit” factor, since they benefit from better and lower prices of production factors. These forms may differ in the “property benefit” factor, since property is a specific asset; and on the “internationalization benefit” factor, since it would be more profitable for the firm to use the assets on its own than to enter into contractual relations with another independent company (Korauš, et. al., 2019).

3. Methods

Taking all of the above into account, we came to the conclusion that the use of one of the forms and methods for attracting investments and creating new jobs is associated with the action of a number of factors. The choice depends on the effectiveness of the national labor market and the security of its organizational functioning, the presence of potential effects from attracting FDI, as well as the absence of certain barriers to attracting a foreign investor. In addition, labor intensity, capital intensity and manufacturability of production are important.

4. Results

The question of the influence of TNC on mobility and work places creation in the world, in our opinion, remains debatable. Until now, the studies were fragmentary, based on aggregated data on the number of jobs created by TNCs in conjunction with the effects of employment associated with changes in the structure of foreign trade generated by the activities of TNCs. The positive effect on the global labor market is mainly due to foreign direct investment being imported, although here they must correspond to domestic macroeconomic indicators.

Scientists (Antras, et al., 2012; Dietzinzacher, Romero, 2007; Harter et al., 2012) came to the conclusion that almost half of work places in most countries of the world are related to serving the interests of TNCs. Influencing the international labor market, TNCs create certain models of employment within the country and in the receiving countries, creating turbulent labor flows, putting pressure on the segment separation of these markets and security of operations.

4.1. Influence of direct investment on segment security of the international labor market

Global production of TNCs can have direct and indirect effects on employment and the level of security of national labor markets, which should be assessed on the basis of domestic and foreign investments made by TNCs. Employment is also affected by the main subject of investment. UNCTAD experts compiled a table determining the possible effects of employment from the use of various TNC strategies (UNCTAD Annual Report (2018)).

Based on UNCTAD data, it can be noted that foreign investments do not so much affect the number of work places, but their quality and movement. Among the positive effects of importing FDI are improvements in the quality of labor and its productivity, as well as the emergence of new organizational methods of work against
the background of the emergence of new work places in areas with a growing supply of labor (Ciobanu, et. al., 2019). The main negative effect on FDI imports is increased competition for local producers, and, as a result, employment problems for workers employed in their enterprises. The positive effects of FDI exportation are improving the skills of local employees by rationalizing production, manufacturing products with higher added value, and as a result the heyday of advanced industries. Negative effects of FDI exports can be expressed in the loss of jobs due to their movement abroad, increased pressure on wages of local employees (UNCTAD Annual Report (2018).

If we talk about trends in the number of people employed in the structure, over the past 25-30 years their number has only increased. Tab. 1 presents the dynamics of the number of employees of foreign affiliates of TNCs.

**Table 1.** Dynamics of the number of employees of foreign affiliates of TNCs, thousand people

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of employees</td>
<td>21524</td>
<td>24476</td>
<td>57799</td>
<td>79825</td>
<td>96135</td>
<td>128775</td>
</tr>
</tbody>
</table>

*Source: UNDP. Human Development Report 2018*

As for developing countries, the opposite situation arises, when TNCs place the main number of jobs not abroad, but in the countries of their main base. Sectoral structure in principle corresponds to the sectoral structure of TNCs, based in developed countries. As a result, the geography of TNCs is not diverse, the bulk of TNCs are concentrated in the Republic of Korea, Hong Kong, Singapore, China, Mexico and the United States.

The unprecedented growth of FDI in recent decades has caused significant changes in the labor market and their segment security, both in developing and developed countries. FDIIs bring capital, technology to target countries, industries, affecting the demand for labor and, thus, the composition of labor, employment, labor productivity, wages, and wage differentials. FDI leads to an increase in “skill premium,” which is the difference between the wages of skilled and unskilled employees. At the same time, if in developing countries we can argue about the existence of a direct positive effect of FDI on employment in the country as a whole and in foreign affiliates of TNCs, in particular, in developed economies the effect on employment is more complex and mixed. In terms of side effects, we can talk about the positive impact of FDI on the increase in wages and productivity of local firms as a result of direct investment by TNCs in the same industry. FDI expands the production structure of the economy, creating opportunities for production of more complex products or introducing more advanced technologies, thereby increasing the demand for skilled labor. This leads to an increase in the overall demand for labor, an increase in wages for skilled labor, which, in turn, leads to an increase in the qualification level of employees, an increase in average wages and an increase in labor productivity. These effects are especially large in countries where skilled labor is scarce and the technological gap is significant.

For the empirical verification of the above statements, how the FDIIs involved in the economy are correlated with the number of jobs created, 23 national economies were selected which proportionally represent the share in the FDIIs received and the number of employees in the branches of TNCs (about 12% of their total). Among the countries studied, 2/3 are represented by developed countries (most of the countries studied are from Europe, the countries of the traditional direction of foreign investment and migration of employees), 1/3 are developing (mainly Asian, in particular countries with dynamic markets), that, in general, is close to the overall structure and recent trends in FDI in the world and the structure of employment of employees in branches of TNCs in the XXI century (Table 2).
Table 2. Correlation matrix of FDI and work places created by TNCs in foreign divisions

<table>
<thead>
<tr>
<th>Number of work places created by TNC</th>
<th>Inflow of foreign investments, million USA dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>China</td>
</tr>
<tr>
<td>-0,6</td>
<td>0,98</td>
</tr>
<tr>
<td>Malaysia</td>
<td>Singapore</td>
</tr>
<tr>
<td>0,97</td>
<td>0,08</td>
</tr>
<tr>
<td>Hungary</td>
<td>Ireland</td>
</tr>
<tr>
<td>-0,44</td>
<td>0,87</td>
</tr>
<tr>
<td>Norway</td>
<td>Sweden</td>
</tr>
<tr>
<td>0,64</td>
<td>0,15</td>
</tr>
<tr>
<td>France</td>
<td>Luxembourg</td>
</tr>
<tr>
<td>0,89</td>
<td>-0,9</td>
</tr>
<tr>
<td>Portugal</td>
<td>Slovenia</td>
</tr>
<tr>
<td>0,93</td>
<td>0,62</td>
</tr>
</tbody>
</table>

Source: UNCTAD Annual Report 2018; calculation authors

Based on the results of the correlation analysis, it can be concluded that there are four groups of countries:

1. group of countries with the highest positive correlation values, which means that there is an unequivocal connection with the growth of work places in TNC enterprises and an increase in FDI inflows, that is, the greater the FDI volume is, the more work places are created by TNCs (such countries are 10: China, Italy, Malaysia, Ireland, Japan, Norway, France, Macau, Portugal, Slovenia);

2. group of countries with low positive correlation values (up to 0.5), which does not allow us to speak about the existence of a unique connection between the growth in the volume of imported FDI and the increase in the number of work places (this includes 7 countries: Germany, Singapore, Taiwan, Sweden, Czech Republic, Finland, Sri Lanka);

3. group of countries with low negative correlation values (up to 0.5), which does not allow to speak about the existence of a close connection between the volume of imported FDI and the growth in the number of work places, nor about the growth in the number of work places under the influence of FDI (this includes 3 countries: the USA, Switzerland, Hungary).

4. group of countries with high negative correlation values, which means the presence of connection between the ratio of the volume of imported FDI and the dynamics of work places growth. It can be argued that the increase in the volume of imported FDI either does not lead to an increase in the number of work places, or generally causes their reduction (this group includes 3 countries: Austria, Luxembourg, Mozambique);

It is obvious that in most of the countries studied there is a positive connection between the volume of imported FDI and the number of work places created, which allows us to conclude that FDI has a positive effect on employment processes within national labor markets.

In order to verify our assumption that the number of people employed in TNCs depends on the amount of initial investment (Greenfield Investment), the cost of mergers and acquisitions (M&A), and also introducing an additional factor to the average wage in the country of origin of investments, we built a model of correlation and regression analysis. The model output data included indicators for 20 countries in Europe and Asia for which comparative figures were available for all three of the above factors for 2017. The choice of this model is due to the fact that it is quite convenient from the point of view of the possibility of an objective assessment and determining the impact on the dependent variable (for our model, the number of employees in the branches of TNCs) from a number of quantitative factors that in our opinion have a significant impact on the subject of analysis (Pickard, 2016).

The authors built a regression model in the form of:
In the case of linear regression, the form of the relationship between the dependent variable \( Y \) and the independent variables \( x_1, \ldots, x_m \) will be:

\[
Y = f(x) + u \tag{1}
\]

In order to establish the influence of independent variables on the dependent one, we established the statistical base of the initial values of the model (Table 3).

### Table 3. Output data of the econometric model

<table>
<thead>
<tr>
<th>Country</th>
<th>Number of employees, ths.</th>
<th>Initial investment volume, thousand dollars</th>
<th>Cost of mergers and acquisitions, thousand dollars</th>
<th>Average salary, thousand dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>208</td>
<td>4259000</td>
<td>1749000</td>
<td>2,176</td>
</tr>
<tr>
<td>China</td>
<td>7903</td>
<td>110356000</td>
<td>5886000</td>
<td>0,92</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>694.7</td>
<td>2050000</td>
<td>1437000</td>
<td>1,05</td>
</tr>
<tr>
<td>Finland</td>
<td>226</td>
<td>4359000</td>
<td>1383000</td>
<td>2,654</td>
</tr>
<tr>
<td>France</td>
<td>1927</td>
<td>41254000</td>
<td>24202000</td>
<td>2,276</td>
</tr>
<tr>
<td>Germany</td>
<td>2121</td>
<td>50266000</td>
<td>6357000</td>
<td>2,634</td>
</tr>
<tr>
<td>Hungary</td>
<td>153.4</td>
<td>140000</td>
<td>4900</td>
<td>0,637</td>
</tr>
<tr>
<td>Indonesia</td>
<td>148</td>
<td>202000</td>
<td>901000</td>
<td>0,372</td>
</tr>
<tr>
<td>Ireland</td>
<td>109</td>
<td>6607000</td>
<td>10778000</td>
<td>2,549</td>
</tr>
<tr>
<td>Italy</td>
<td>98</td>
<td>19686000</td>
<td>8716000</td>
<td>1,629</td>
</tr>
<tr>
<td>Japan</td>
<td>482</td>
<td>48449000</td>
<td>20088000</td>
<td>2,481</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>82.1</td>
<td>7150000</td>
<td>2420000</td>
<td>5,021</td>
</tr>
<tr>
<td>Macao</td>
<td>69.3</td>
<td>185000</td>
<td>101000</td>
<td>0,465</td>
</tr>
<tr>
<td>Norway</td>
<td>78.1</td>
<td>2804000</td>
<td>1858000</td>
<td>3,305</td>
</tr>
<tr>
<td>Portugal</td>
<td>145</td>
<td>1560000</td>
<td>2079000</td>
<td>0,952</td>
</tr>
<tr>
<td>Singapore</td>
<td>161.8</td>
<td>26025000</td>
<td>4450000</td>
<td>3,106</td>
</tr>
<tr>
<td>Slovenia</td>
<td>65.8</td>
<td>60000</td>
<td>202000</td>
<td>1,226</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>444.7</td>
<td>276000</td>
<td>72200</td>
<td>0,266</td>
</tr>
<tr>
<td>Sweden</td>
<td>572.7</td>
<td>8483000</td>
<td>9406000</td>
<td>2,465</td>
</tr>
<tr>
<td>Switzerland</td>
<td>341</td>
<td>15828000</td>
<td>7922000</td>
<td>4,945</td>
</tr>
</tbody>
</table>

Source: UNCTAD Annual Report 2018; World Investment Report 2017; World Investment Report 2018; calculation authors

According to the above analysis, it was found that there is a tight correlation \((\geq 0.66)\) between the number of employees and FDI for most of the countries studied, on the other hand, we assume that the initial investment has a greater impact on the creation of new work places than mergers and acquisitions. Based on the fact that the amount of FDI is actually equal to the sum of the initial investment and M&A there is a high probability that the degree of interrelation between independent variables will be greater than their effect on the independent variable (multicollinearity), and the values of the parameters will be ineffective. In order to eliminate these phenomena, we used a modified least squares method. The specificity of this method is the calculation of the unbiased estimate for the variance of residuals \( (\delta^2) \) obtained as follows:
where:

\( n \) – number of study options;

\( m \) – number of degrees of freedom;

\( u \) and \( u' \) – real and estimated distribution of residuals;

\( S^{-1} \) – matrix inverse to the matrix of linearized initial values.

Linearization of the initial values of the model is an important step in the construction of linear regression, which contains the value of different orders. Among the data (Table 3) has the value of the 3rd (thousands), 6th (millions) and 9th (billions) order, in this context there is a need for their linearization, that is, reduction to proportionate values. In practice, such an operation is performed using the logarithm of the corresponding values by the decimal logarithm (Table 4).

**Table 4.** Output data values listed by the base of the decimal logarithm (\( \lg(x) \))

<table>
<thead>
<tr>
<th>Number of employees</th>
<th>Initial investment volume</th>
<th>Cost of mergers and acquisitions</th>
<th>Average salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,318063</td>
<td>6,629308</td>
<td>6,24279</td>
<td>0,337659</td>
</tr>
<tr>
<td>6,897792</td>
<td>8,042796</td>
<td>6,76982</td>
<td>-0,03621</td>
</tr>
<tr>
<td>5,841797</td>
<td>6,311754</td>
<td>6,157457</td>
<td>0,021189</td>
</tr>
<tr>
<td>5,354108</td>
<td>6,639387</td>
<td>6,140822</td>
<td>0,423901</td>
</tr>
<tr>
<td>6,284882</td>
<td>7,615466</td>
<td>7,383851</td>
<td>0,357172</td>
</tr>
<tr>
<td>6,326541</td>
<td>7,701274</td>
<td>6,803252</td>
<td>0,420616</td>
</tr>
<tr>
<td>5,185825</td>
<td>5,146128</td>
<td>3,690196</td>
<td>-0,19586</td>
</tr>
<tr>
<td>5,170262</td>
<td>5,305351</td>
<td>5,954725</td>
<td>-0,42946</td>
</tr>
<tr>
<td>5,037426</td>
<td>6,820004</td>
<td>7,032538</td>
<td>0,40637</td>
</tr>
<tr>
<td>4,991226</td>
<td>7,294157</td>
<td>6,940317</td>
<td>0,211921</td>
</tr>
<tr>
<td>5,683047</td>
<td>7,685285</td>
<td>7,302937</td>
<td>0,394627</td>
</tr>
<tr>
<td>4,914343</td>
<td>6,854306</td>
<td>6,383815</td>
<td>0,70079</td>
</tr>
<tr>
<td>4,840733</td>
<td>5,267172</td>
<td>5,004321</td>
<td>-0,33255</td>
</tr>
<tr>
<td>4,892651</td>
<td>6,447778</td>
<td>6,269046</td>
<td>0,519171</td>
</tr>
<tr>
<td>5,161368</td>
<td>6,193125</td>
<td>6,317854</td>
<td>-0,02136</td>
</tr>
<tr>
<td>5,208979</td>
<td>7,415391</td>
<td>6,64836</td>
<td>0,492201</td>
</tr>
<tr>
<td>4,818226</td>
<td>4,778151</td>
<td>5,305351</td>
<td>0,08849</td>
</tr>
<tr>
<td>5,648067</td>
<td>5,440909</td>
<td>4,858337</td>
<td>-0,57512</td>
</tr>
<tr>
<td>5,757927</td>
<td>6,928549</td>
<td>6,973405</td>
<td>0,391817</td>
</tr>
<tr>
<td>5,532754</td>
<td>7,199426</td>
<td>6,898835</td>
<td>0,694166</td>
</tr>
</tbody>
</table>

*Source: UNCTAD Annual Report 2018; World Investment Report 2017; World Investment Report 2018; calculation authors*

Based on the data in Table 4 a regression equation was built:

\[
Y = 0,77 + 0,38x_1 + 0,35x_2 - 1,04x_3
\]

(5)

where:

\( Y \) – number of employees;

\( x_1 \) – volume of initial investments;

\( x_2 \) – cost of mergers and acquisitions;

\( x_3 \) – average salary in the country of origin of investments.
The resulting equation establishes that the amount of initial investment and the cost of mergers and acquisitions have a positive effect on the number of employees, and the average salary in the country of origin of investments negatively affects the number of employees. In addition, it confirms our assumption that the initial investment creates more work places than the rising cost of mergers and acquisitions - 0.38% and 0.35%, respectively. The difference is 0.0003 times, which in terms of the values of the 9th order (1 billion) is $300 thousand, which is obviously a rather tangible figure.

In order to verify the adequacy of the model, standard tests were used, first of all the value of the coefficient of determination $R^2$, the value of which was 0.68, which, given the number of observations (20), is an indicator of the model’s high confidence, that is, the dispersion of the values of the increase in the number of people employed corresponds to the real indicators. The $P$-value for the coefficients was 0.019, 0.028, 0.018, respectively, that is, all defined coefficients are significant and there is less than the established significance level of 0.05.

We determined that the key factors that determine the mobility of labor resources within the framework of TNCs are FDI (primarily initial), as well as the level of remuneration (almost linearly inverse dependence). However, the weight share of other factors that are determined by the characteristic features of mobility within the framework of the modern knowledge economy and directly affect the international movement of employees within TNCs remains significant (about 34%), and information and ICT technologies are crucial for the migration management of TNCs (Makedon, 2019). Also, an important role is played by the tendency to labor mobility and the presence of an active labor position, job satisfaction of the working TNC itself, the quality of the social environment of the TNCs, as well as the general situation on the labor market.

The UNCTAD statistics show that among countries with high correlation rates, a small amount of mergers and acquisitions is typical for such countries as China, Malaysia, France, Macao, Portugal. In Ireland, Italy, Japan, Norway and Slovenia for individual years (for the period from 1990 to 2017) the volume of M & A transactions exceeds the volume of imported FDI several times. However, both the first and second group of countries demonstrate a steady growth in work places as FDI arrives (UNCTAD Annual Report (2018). Therefore, in our opinion, it is impossible to talk about the existence of a unique connection between the method of attracting FDI and the dynamics of work places growth. Everything will depend on the production management style, the quantity and quality of new technologies introduced to the company as a result of mergers or acquisitions, as well as the future joint strategy for developing joint business.

4.2. Relationship of national labor markets and global value chains

Thus, an increasing number of employees are attracted to the global labor market precisely because of the intensification of the processes of transnationalisation of business, in fact, blurring the boundaries between individual states (Bradley, 2014). The question of the effects of FDI for both capital-importing countries and capital-exporting countries remains controversial. At the same time, the choice of the method of creating a business abroad as part of attracting FDI often depends on the technological effectiveness of production and the purposes of creating production abroad, rather than on formal beliefs in the benefits of using one or another mode of production development.

It should be also noted that participation in global value chains, as a rule, leads to the creation of new jobs in the domestic market from exports and more rapid employment growth, even if there is a large share of the import component in exports. In general, employment increases with trade, but the effect on employment from trade and participation in global value chains is quite diverse. Model VAC, as a rule, create new jobs. Wage costs as a component of domestic value added in export industries — an indicator of the potential for creating new jobs in export industries — grows with the rise of VAC positions (Fig. 2).
The average labor force share is 43% for countries in the first quarter of the participation rate in VAC compared to a share of 28% for countries that are less involved in VAC. In addition, from 2007 to 2017, countries that had a high level of growth in participation in VAC showed that their labor component in export industries grew faster (by 14%) than in countries with a low level of growth in participation in VAC (9%). This effect takes place regardless of participation in VAC combined with high external value added in exports. In other words, even if the participation of countries in VAC depends on a larger import component, which reduces the share of domestic value added, and the increase in the total share of employment in export industries will be higher than in cases where countries are less involved in the VAC (Wright, et. al., 2014).

Work places created using VAC vary in quality. Employees may face low wages, harsh working conditions, and insecurity because VAC jobs are more dependent on international demand and competition (Fig. 3).
Countries that use less import components

Countries with the high level of increase in VAC participation indicator

Countries with the low level of increase in VAC participation indicator

0% 2% 4% 6% 8% 10% 12% 14% 16%

Fig. 3. Growth of the labor component of domestic value added in exports, in terms of the growth rate of VAC and the addition of external value

Source: Information Economy Report 2017; World trade statistical review 2018; calculation authors

As a result of the growth of global production capabilities and the growth of export-oriented industries in many developing countries, coupled with increased global competition due to the entry of large new producers and exporters (located mainly in Asia), transnational corporations face significant pressure to reduce costs and increase productivity in their VAC (also referred to as “global production systems”). In turn, this puts considerable pressure on both wages and working conditions. Especially in labor-intensive industries (in the textile and clothing industry), where global buyers can use their preemption rights to cut costs, this effect often leads to lower wages, although there are significant differences between countries and between industries within such countries (Ryan, Pointon, 2017; Vakulyk, O.O., Andriichenko, N.S., Reznik, O.M., Volik, V.V., Yanishevska, K.D., 2019).

5. Discussion

Despite such initiatives, some types of employment in VAC provide unreliable incomes and employment prospects for employees. Participating countries face a range of potential risks associated with labor.

Expenditure burdens from global buyers mean that VAC-related employment can be unreliable and have poor working conditions. While some core employees receive more in terms of wages and privileges than key suppliers; global purchasing companies often reduce costs through the use of temporary workers or laborers in their enterprises and transfer certain types of work to subcontractors where working conditions are much worse. (Hummels, et. al., 2001).

Some VAC activities are independent, and displacement may lead to a decrease in local employment. Transnational corporations in the provision of services have more opportunities to move production between countries than most domestic firms. For simple tasks in the value chain and where the share of internal value added is low, the cost of moving is usually also lower. Similarly, global buyers using non-equity-related manufacturing mechanisms to source products from local suppliers (in domestic or foreign ownership) can redistribute an order from one country to another.

Export-oriented types of employment in general are more susceptible to fluctuations in global demand and supply, and therefore to the effects of factors that are far from the place of employment. VAC jobs may be lost in the event of fluctuations in demand and the onset of an economic crisis. Fluctuations in demand may be
seasonal (as in the fashion industry), as a result of weather conditions (in the food industry), or caused by an economic downturn and crisis. Temporary workers are more at risk of losing their jobs, but this can also affect permanent employees.

Conclusions

The growth of employment in the framework of international corporations in modern conditions of transnationalisation and globalization of production processes occurs as a result of an increase in the number of FDI and international outsourcing of certain production tasks, which, due to transnationalisation, are two main forms of work places creation. Outsourcing in TNC divisions allows us to perform individual production tasks more quickly and professionally, with an overall cost savings for TNC. At the same time, TNK receives a stable, reliable, high-quality and professionally rendered service from an employee in outsourcing, while for an outsourcer, the key advantages are high salaries and no need to change their permanent place of residence. Foreign investments have a particularly significant impact on the quality of migration movements within TNCs, in particular, increasing labor productivity, security level of labor markets, and improving organizational methods of work against the background of the emergence of new jobs in regions of growing labor supply.

Having analyzed the activities of TNCs, our study showed a close correlation between the volume of FDI and the number of jobs created in the branches of TNC. We identified 4 groups of countries: 1) with the highest positive correlation values (44% of the total), 2) group of countries with low positive correlation (30%), 3) countries with low negative correlation values (13.5%), 4) countries with high negative correlation values (12.5%). The effects of investments on the labor market largely depend on macroeconomic factors in the individual receiving country, as well as corporate strategy and organizational structure of TNCs.

References


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TRANSPARENT COGNITIVE TECHNOLOGIES TO ENSURE SUSTAINABLE SOCIETY DEVELOPMENT

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Abstract. The article formalizes theoretical and methodological foundations of the use of parametric artificial intelligence technologies to ensure the security of sustainable society development. An algorithm for using an artificial neuron to describe a model of social development is proposed. Optimization of the processes of using neural networks in creating an expert system for forecasting safe social development is conducted.

Keywords: operation security; social development; artificial intelligence; artificial neuron model; macroeconomic indicators; system adaptability; “window method”

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JEL Classifications: C10; M14

1. Introduction

Modern real systems (technical, economic, social, environmental, etc.) in the system of global world order are imperfect due to the complexity of internal relationships and the influence of a large number of parametric factors, which cannot be always predicted and taken into account. At the same time, systems of society development can change a mode (in a planned way or randomly), structure of elements, which identifies new states of a system and its security, which qualitatively differ from previous ones, defining unstable and unsteady development of all social processes. The above problems do not allow to describe in detail the processes using traditional approaches, in particular, causation in the form of comparative systems and theoretical models.

Today a new scientific trend is actively developing based on the representation of multidimensional social and public processes in the form of cognitive models and connections. Their use allows to describe the dynamics of complex social systems and to predict their future behavior and safe development.

2. Literature Survey

The methodological basis of our study is determined by the interpretation of forecasting methods, and features and patterns of the studied processes. We emphasize the following methods we need: 1) Formalized thinking.
The essence of the method is that the determining value of the ratio of the horizon of forecasting (warning period) \( \Delta t \) and the evolutionary period (retrospective period) of the development of a social process \( t_x \) is determined by the formula (Beatty, 1995):

\[
\tau = \frac{\Delta t}{t_x}
\]  

(1)

If \( \tau < l \) (the horizon of forecasting fits within the evolutionary cycle) then it is recommended to use formalized methods. With \( \tau \sim l \) the possibility of dramatic changes in development, intuitive methods are significant and more effective.

1) According to the scientific works (Belkin and Niyogi, 2002; Krippendorff, 2004; Dalevska, N., Khohta, V., Kwilinski, A., & Kravchenko, S., 2019), formalized methods can be used before and after turning events. If several evolutionary periods fit within a social study period \( \tau >> l \) then intuitive methods are used to develop forecasts (Kwilinski, A., 2019a,b).

2) Intuitive methods (Fernández-Rodríguez, et. al. 2000; Krizhevsky, A., Sutskever, Hinton, 2012; Watts, 1999). Intuitive methods are used when the object of forecasting is either too simple or so complex and unpredictable that it is almost impossible to analytically take into account the influence of many factors. Individual and collective peer reviews obtained in such cases are used as final forecasts or as initial data in integrated systems for forecasting safe social development. The content of intuitive forecasting methods consists in the intuitive choice of the most important and decisive ones from the numerous circumstances (Bilan, Y., Lyeonov, S., Lyulyov, O., Pimonenko T., 2019).

3) The methods based on nonlinear models are thoroughly presented in the works (Jang, et. al. 1996; Jin, et. al. 2017; Poteete, et. al. 2010), remove the limitations inherent in statistical methods and satisfy the above requirements. Most of these methods belong to the category of artificial intelligence technologies. These are artificial neural networks and the latest means of optimization in determining the development and security of social processes.

### 3. Methods

The studies of the properties of macroeconomic systems (Goodfellow and Courville, 2016; Bikas, Saponaitė, 2018; Ostrom, 2009; Tkachenko, V., Kwilinski, A., Klymchuk, M., & Tkachenko, I., 2019; Baltgailis, 2019; Selivanova-Fyodorova et al., 2019; Sriyana, 2019; Kuzmin et al., 2019; Kaluge, 2019; Vinogradova et al, 2019) under study indicate that it is possible to identify models of behavior of local, recurring social systems and to use them to forecast preserving or reversing a trend. For the macroeconomic systems under study, it makes sense to develop forecasting models that are able to “remember” past social situations and consequences (that is, their continuation) that are relevant to them, in order to further compare them with the situations that happen in the evolutionary development of society.

### 4. Results

A possible solution to the set task may be a database into which you can record social situations and manifestations encoded in a certain way. In order to make a forecast, one would have to review all the records, which must be very numerous in order to have a forecast of safe development with required accuracy. This idea is not constructive because of the complexity of data access and information matching criteria, and more. The ability to “remember” is inherent in technologies that are combined under the name Computational Intelligence (Laurier, et. al. 2016; Vasylieva, T., Lyeonov, S., Lyulyov, O., & Kyrchenko, K., 2018) allowing to obtain continuous or discrete solutions as a result of modeling based on available data.
One of the subclasses of the discussed group of methods is neural networks (NN) using stochastic algorithms to forecast and manage the secure development of social processes through self-organization (Coppin, 2004; Lakhno, V., Malyukov, V., Bochulia, T., Hipters, Z., Kwilinski, A., & Tomashevska, O., 2018). These methods do not imply any restrictions on the nature of the input public information. These can be indicators of this interim series as well as information about the behavior of other public objects.

The processed information on social process data is numerical in nature allowing the use of NN, for example, as a model of systems with completely unknown characteristics. NN is a set of neurons connected in a certain way. A neuron is an elementary conversion component with a non-empty multitude of inputs that receive signals $x_1, x_2, ..., x_n$ (Fig. 1), a summation block, a block of signal conversion using an activation function and a single output $Y$.

![Figure 1](image)

**Figure 1.** An artificial neuron to describe a model of social development

Each input has its own "weight" $w_i$ corresponding to the "strength" of the synaptic connection. The neuron works in two cycles. In the first cycle in the summation block the amount of excitation obtained by the neuron is calculated:

$$S = \sum_{i=1}^{n} x_i \times w_i = (X, W)$$  \hspace{1cm} (2)

which can be conveniently represented as a scalar vector of inputs to a vector of weights. In the second cycle the total excitation is passed through the activation (conversion) function $F$, which determines the output signal $Y=f(S)$.

The multilayer network can form an arbitrary multidimensional function at the output at the appropriate choice of the number of layers, the range of signal changes and the parameters of neurons. The neural network implements the following conversion of the initial function:

$$y = f(x) = F \left\{ \sum_{i} w_{i,j} x_i \times x_{j1} \theta_{j1} + \sum_{i2} w_{i2,j} x_{i2} \theta_{j2} + \cdots \right\}$$  \hspace{1cm} (3)

where:

- $i$ – input number;
- $j$ – neuron number in a layer;
- $l$ – layer number;
$N$ – number of layers;

$x_{ijl}$ – input signal $i$ of neuron $j$ in layer $l$;

$w_{ijl}$ – weight factor of input signal $i$ of neuron $j$ in layer $l$;

$\theta_{jl}$ – threshold of neuron $j$ in layer $l$.

Through the alternate calculation of linear combinations and nonlinear conversions, the approximation of an arbitrary multidimensional function is achieved with the appropriate choice of network parameters.

At the same time, adaptability refers to the process of changing the parameters and structure of the formed model at the initial uncertainty in working conditions, which has a volatile nature based on current input management information in order to achieve a certain condition characterized by a given threshold of accuracy. Mechanism of adaptation of models formed with the help of artificial intelligence system (artificial intelligence system – AIS). At the same time, as a rule, the topology of the network is considered to be unchanged, and tunable parameters are usually related to the parameters of neurons and the magnitude of synaptic weights.

Currently, there are many variations of neural networks capable of performing various operations with initial information. The most appropriate paradigm for forecasting the dynamic state of non-stationary macroeconomic systems is AIS with the following features (Gevrey, et. al. 2003):

a) by the method of learning – models with social direction or development vectors, to identify internal potential based on analysis of the history of society.

b) by the nature of propagation in information networks – recurrent networks based on the algorithm of propagation of error signals from the outputs of the neural network to its inputs, in the direction opposite to the direct propagation of signals in the normal mode of operation.

The above paradigm allows to use neural networks as a “black box”, which is “presented” the task input data and the response that corresponds to these data, previously discovered, when forming the parameters of social model development. AIS itself, in the process of safe development, must build within the “black box” the process under study (identify the dynamics) in order to produce the response that matches the correct one (Selsam, et. al. 2019). The more different pairs of the “initial data” on secure social development – the “response” will be given to NN, it will create the more adequate logical target decision-making function within the model of social development.

The significance of such a neural network concept regarding the task of forecasting the security of development is determined by the general principles of operation of multilayer perceptrons and includes three stages: 1) collection and preliminary processing of input data; 2) perceptron learning; 3) recognition (forecast) of the model of safe development of society (Hamill, 2017; Pająk, K., Kvilinskyi, O.; Fasiecka, O., & Miśkiewicz, R., 2017).

The pattern of the solution of the task of forecasting macroeconomic and social processes based on security principles can be presented in the form of a sequence of stages (Fig. 2).
At the initial stage, NN restores the target function using multiple sets of macroeconomic samples, that is, solves the task of interpolation of safe development. At the stage of using the formed NN model (forecasting), the network will use the restored dependency for forecasting, i.e. solve the task of extrapolation.

The ability to abstract at the stage of preliminary conversion allows AIS to ignore the secondary properties of the data set under study and to identify the main ones within the model of safe society development. However, these properties, given the set task of forecasting, can be a disadvantage, because sometimes a small property of the studied non-stationary processes in the rapidly changing economic situations can have a significant impact on social development and security characteristics in the future (Metelenko, et. al. 2019). In addition, the parameter setting process (parametric synthesis stage) of the neural network model is non-deterministic by nature, does not always sum up, requires the use of a large number of different heuristic tricks, depends significantly on the complexity of the initial data, the selected network architecture (NN structural synthesis stage) and computational resources.

The stages of preliminary conversion and parametric synthesis of NN determine the main points, keeping track of which allow you to create expert systems of forecasting with the help of the apparatus of artificial neural networks.

The stage of preliminary conversions is necessary for the neural network to solve the problem of extrapolation of initial values by solving the problem of interpolation of converted values of factors. It should be noted that the important stage of neural network computing is the stage of preliminary data conversion. The speed of modern learning algorithms, the ability of the neural network to remember (selection of characteristic patterns in instructive data) and the generalization (adequate processing of unused input signals for development security) depend exactly on what form the data is presented in, how their preliminary selection is performed. In addition, preliminary conversion allows ensuring the invariance of feature sets, as determined by the fact that the signals distributed over the neural network must be limited by the space determined by the asymptotic interval of the activation functions of the network neurons in the current model of social development.
The values of the signals of the first NN output layer may be in the interval \([-2, 2]\). The conversions performed in the second layer in the space of activation functions in the interval \([-1, 1]\) “cut off” the informative part of the signal values above or below this interval. At the same time, the values that did not fall within this interval are approximated by the neural network with the values of the asymptotic activation functions (Kashima, et. al. 2003).

The above problems generally impose determinative constraints on the input and output samples of the input values given for the NN operation and as a whole determine the ability of the NN to make general conclusions – the NN can forecast the behavior of a particular social model only in the space of the activation function. At the same time, the multitude must contain the behavior of the indicator throughout the space. Only taking into account these constraints the NN is able to make general conclusions and consequently make forecasts. Thus, at the stage of preliminary conversions it is necessary to ensure invariance of the feature set so that they are located in the space of the activation function (Scarselli, et. al. 2009).

Let us consider a simple way of forming invariant images. The basic concept here is “window” (“immersion depth”), that is, the number of time periods (or other parameter by which extrapolation is conducted) into which vectors fall that are formed at the input and output of the network, for which \(n\) input neurons and \(m\) output neurons are allotted accordingly.

![Diagram](image_url)

**Figure 3.** The method of normalizing input and output images of the initial sample to ensure development security based on the parameter of elementary “windows”
The data of each of these vectors is limited by a range \([Min...Max]\). The simplest way to form the “window” in the space of the activation function of an artificial neuron would be to transform by the formula:

\[
\hat{x} = \frac{x - Min}{Max - Min}
\]

(4)

where:
- \(x\) – initial vector;
- \(\hat{x}\) – scaled vector;
- \(Max\) and \(Min\) – respectively maximum and minimum values of the “window”.

After such transformation, each vector consisting of \(n(m)\) consecutive values is normalized so that all its values lie in the range from 0 to 1. In this case, the values of the input and output images fit into the hypercubes of dimension \([0,1]^n\) and \([0,1]^m\) (Fig. 3).

While the above transformation by the formula (4) guarantees the invariance of the initial vectors of instructive samples, it is not optimal. The activation function that determines the specified values in the end must also be symmetrical. Thus, the initial magnitude of the features must be translated into space \([-1,1]\) (Zhang and Chen, 2018). Scaling is as follows:

\[
\hat{x} = (x - m) \times c
\]

(5)

the appropriate choice of the scale factor \(c\) allows you to perform the specified transformation; \(m\) – the average value of the set of input data.

However, when using the following formula (6) it is necessary to select the value of the scale factor, which is not convenient in most cases. The research used the empirical formula 5, which scales a vector from \([MinR, MaxR]\) to \([MinC, MaxC]\):

\[
\hat{x} = MinR + \frac{(x - MinC)}{(MaxC - MinC)} \times (MaxR - MinR)
\]

(6)

The transformation by the formula (6) eliminates the above disadvantages of the formulae (4) and (5) and can be recommended when calculating the parameters of safe development. It should be noted during scaling the interval of the sample image should not coincide with the asymptotic interval of the activation functions. It is necessary to select a slightly smaller value of the window interval (in practice limited by 5% barrier) – this

**Figure 4.** The process of secure social development through the “window method”
action allows to improve the quality of NN use, since the activation function in this case will not try to approximate the values lying on the asymptote of the activation functions (Kipf and Welling, 2016).

Thus, forecasting based on elementary “windows” involves the use of two windows $W^n_i$ and $W^{out}$ (Fig. 4) with fixed sizes $n$ and $m$ respectively.

These windows, which are able to move in certain increment by a sequence of features, starting with the first element of the sample under study, and are intended to access time series data, with the first $W^n$ window that receives such data transmitting them to the input of the neural network and the second $W^{out}$ window to its output. Thus, at each step, $W^n_i/W^{out}$ pairs form a set of secure system development sample.

Assuming the presence of latent dependencies in the sample sequence as a multiple of observations, then by instructing NN based on these observations you can obtain the necessary dependence, which can be used to build a forecasting model of artificial intelligence for the security of society development.

5. Discussion

Recommendations for further research are determined by the very structure of the cognitive network based on the procedure of back propagation of the network error, the pattern of signal distribution is identified, the error criteria are proposed increasing the quality of the network performance. It is promising to work in the area of evaluating the impact of modification of the basic back propagation algorithm on the speed and quality of development security of social systems and formations, in particular in the direction of introducing the accumulation of cumulative gradient by the sample of indicators and minimizing the cumulative quality criterion for all errors of individual development images, which will allow to increase the speed of convergence by 4-5 times compared to the basic algorithm and accelerate the methods neural network optimization and learning.

Conclusions

Thus, the use of artificial neural network apparatus allows to create functional models for forecasting the safe development of society, which are not set in advance but generated by the data itself – the sets used by the network to learn, but at the same time, there is a number of disadvantages not allowing to fully use NN in forecasting non-stationary macroeconomic and social processes, which are determined by a significant distortion of the results at the stages of model setting.

The developed recommendations touch upon the main stages of determining the quality of the created models to forecast the security of development based on the apparatus of AIS. The creation by means of “window” transformation operations and discrete differentiation of invariant images determines the possibility of extrapolation (forecasting) for the investigated non-stationary samples. The use of anti-gradient network setting methods based on nonlinear optimization algorithms allows you to successfully approximate the target function of NN in the points of local minima of the error function, which increases the quality of the model formed by the network.

References


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Abstract. This paper examines the impact of public spending on ASEAN-5 countries economic development. The purpose of this study is to provide evidence, reference and contribute to the knowledge about government spending and economic growth. This study involves ASEAN-5 countries. The countries are Thailand, Singapore, Indonesia, Philippines and Malaysia. The countries are chosen because there is a lack of study of government expenditure for ASEAN-5 countries using panel data. The data covers from year 1990 to 2014. The data is retrieved from the World Development Indicators (World Bank). The dependent variable is gross domestic product (GDP). GDP is used to measure economic growth. The main independent variable is government expenditure. The other independent variables are gross capital formation, portfolio investment, labor, trade, total reserve and gross savings. A clear understanding about inter-linkages between government spending and economic growth will help the government in making better decision for the country. As ASEAN countries have responsibility for ASEAN Economic Community (AEC) Blueprint 2025 to meet its objectives, ASEAN governments are expected to effectively monitor the public spending as fiscal instrument in stimulating economic growth. Government expenditure may become unproductive if misallocating and using it in excess. From this study, there is evidence that government expenditure has impact on economic growth. Future research is expected to expand the investigation to other composition of government spending such as education, defense and infrastructure expenditures instead of using general government final consumption expenditures.

Keywords: ASEAN; economic growth; trade, capital formation


JEL Classifications: F23, Q24, E22

1. Introduction

Numerous of previous research have been conducted regarding government spending (GSP) and economic growth (ECNG). This relationship is an important part studied in public economics. The relationship was first investigated empirically by Wagner more than a hundred years ago. Wagner introduced the ‘law of the expanding state role’. It is also called Wagner’s Law. Wagner’s Law suggests that public spending may cause economic progress. According to Wagner, GSP is positively responding to ECNG. Increasing income of a country will increase public sector’s size of the country. Wagner also found that public spending is income-elastic. Wagner suggests that consumption of elasticity for public good is greater than one and elasticity consumption from
private sector is less than one. Most of public goods and services are considered as civil goods. Education and health care services are examples of civil goods.

As income increases, the demand for civil goods increases faster than increment in income level. Therefore, public spending should also increase faster compared to increment in national income due to a greater demand of enactment, laws and policy of civil goods (Pradhan, Arvin, & Norman, 2015). Wagner concluded that the economic development leads to more administrative functions of the states; increase in allocation of money in social and cultural goods and services; and increase in proper administrative and bureaucratic controls (Demirci, Soon, & Wallace, 2016; Okon & Monday 2017; Sasongko et al. 2019). Pradhan et al. (2015) agree with Wagner’s Law. Naseer (2019) conclude that governments spend money for certain goals. For example, to increase per-capita income. Therefore, they have responsibility to ensure different components of expenditure meet the objectives. However, there is no exact economic theory or empirical evidence to measure the correct composition of PEX in boosting ECNG.

If one market fails to provide public goods, then only governments will justify their intervention for the related market. There is no guidelines or operational rules in their decision making about the spending that need to be cut in public sector. Wagner suggests that public expenditure (PEX) has impact on ECNG where public spending expands faster than national income. The causality runs from income to GSP. However, according to Keynesian macroeconomic viewpoint, the causality runs from public spending to income. Keynesian theory views the GSP as an instrument policy to increase ECNG. The Keynesian viewpoint believes that governments should spend more and reduce tax to stimulate economy downturn. As the economy slows down, the unemployment rate and economic dislocation is high. In that case, governments should increase certain public sector programmed (Demirci et al., 2016; Nazal, 2017; Baltgailis, 2019; Tung, 2019).

The issue of GSP and ECNG is crucial for developing countries. The public sector usually uses a relatively large share of society’s economic resources (Odhiambo, 2018; Mohamed, Rasheli & Mwagike 2018). As mentioned by Wagner’s Law, public spending will increase as per capita income increases. A growing economy will cause administrative and protective functions of the state to expand. Higher public spending is required to maintain law and order as well as socio-economic regulation. As complexity of economic life and urbanization increases, the government need to spend more on regulations.

Furthermore, public spending on cultural and welfare services are also increased during industrialization. This is due to high demand or high-income elasticity for cultural and welfare services, and usually these services are provided by government. PEX for these services will increase rapidly as the demand of these services increase. In addition, technological needs require larger amounts of capital. The government has to provide the capital
funds to finance large-scale capital expenditures since the private sector does not have the capacity to provide
the funds; as stated by Odhiambo (2018) and Pradhan et al. (2015).

GSP is increasing over the years. There is a need to test the relationship between government expenditure
and economic development of a country. Pradhan et al. (2015) agree that government expenditure has a posi-
tive impact on ECNG. In some cases, government expenditure does not have a significant relationship with
ECNG. Naseer (2019) conclude that productive PEXs may become unproductive if misallocating and using
it in excess.

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they have responsibility to ensure different components of expenditure meet the objectives. However, there is
no exact economic theory or empirical evidence to measure the correct composition of PEX in boosting ECNG.
If one market fails to provide public goods, then only governments will justify their intervention for the related
market (Russell et al., 2017; Ryan & Robert, 2017). There is no guidelines or operational rules in their decision
making about the spending that need to be cut in public sector.

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economic viewpoint, the causality runs from public spending to income. Keynesian theory views the GSP as an
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and reduce tax to stimulate economy downturn. As the economy slows down, the unemployment rate and eco-
nomic dislocation is high. In that case, governments should increase certain public sector programmes (Demirci
et al., 2016; Mulyani, 2017).

The Association of Southeast Asian Nations (ASEAN) countries were held their first meeting in Bangkok,
Thailand on 8 August 1967. There were five countries joining ASEAN: Thailand, Singapore, Philippines,
Indonesia and Malaysia. The first ASEAN meeting was called ASEAN declaration or Bangkok declaration.
Then, another five countries joined ASEAN. This paper examines the impact of public spending on ASEAN-5
countries economic development. The purpose of this study is to provide evidence, reference and contribute
to the knowledge about GSP and ECNG. It is expected to clarify the importance of fiscal policy and other
macroeconomic variables in strengthening the economy for ASEAN-5 countries. A clear understanding about
inter-linkages between GSP and ECNG will help the government in making better decision for the country. As
ASEAN countries have responsibility for ASEAN Economic Community (AEC) Blueprint 2025 to meet its
objectives, ASEAN governments are expected to effectively monitor the public spending as fiscal instrument in
stimulating ECNG. Government expenditure may become unproductive if misallocating and using it in excess,
as suggested by Naseer (2019).
This study involves ASEAN-5 countries. The countries are Thailand, Singapore, Indonesia, Philippines and Malaysia. The countries are chosen because there is a lack of study of government expenditure for ASEAN-5 countries using panel data. The data covers from year 1990 to 2014. The data is retrieved from the World Development Indicators (World Bank). The dependent variable is gross domestic product (GDP). GDP is used to measure ECNG. The main independent variable is government expenditure. The other independent variables are gross capital formation, portfolio investment, labor, trade, total reserve and gross savings.

2. Literature Review

Researchers have used various methods for explaining the effects caused by government expenditures on ECNG. For analyzing GSP ECNG relationship in 15 European Union economies, Sáez, Álvarez-García, and Rodriguez (2017) employed random and fixed effect approaches and found positive impact of UK and Portugal’s government expenditure on their ECNG. However, in case of Italy, Austria, Sweden and Finland, results revealed the existence of negative association among ECNG and GSP, whereas, no significant relationship is obtained, for the rest of the countries. Furthermore, Ayinde, Ilori, Ayinde, and Babatunde (2015) investigated the association among recurrent expenditures, different government’s sources of revenues, ECNG and capital expenditure in Nigerian economy, for a period of 1981-2011, using co-integration, unit root test, combined estimators’ analysis and error-correction mechanism. The statistical findings suggested that recurrent expenditure, capital expenditures, federal retained revenue, and oil revenues positively influence ECNG in Nigeria. Another study (Alexiou, 2009; Negrut, 2017) examined the GSP and ECNG relationship for 7 South Eastern European (SEE) countries namely Serbia, Bulgaria, FYROM, Bosnia, Croatia, Romania, and Albania, by employing panel data for the time period 1995-2005. As a result, positive impact of GSP on private investment, capital formation, trade openness, and development assistance is found on the ECNG in these economies, however, insignificant relationship is found between ECNG and population growth.

Using time series approach, Pradhan et al. (2015), Odhiambo (2018) and Naseer (2019) found the same result for the relationship between government expenditure and ECNG. Pradhan et al. (2015) investigate the relationship in Greek from year 1960 to 2001, Fawwaz (2016) performed their study in Nigeria from year 1977 to 2012 and Odhiambo (2018) test the relationship for ASEAN-5 countries from year 1960 to 2002. They agree that there is a long-run positive impact of GSP on economy of these countries. Pradhan et al. (2015) tested income elasticity by using gross national product and per capita gross national product as independent variable; and total and partial public spending as dependent variable. The result confirms Wagner’s Law, however, a bi-directional causality is found from the Granger-causality test among ECNG and PEX.

According to Keynesian macroeconomic viewpoint, government expenditure does Granger cause ECNG. The causality direction runs from government expenditure to economic activities. In Keynesian hypothesis, ECNG is the outcome of government expenditure. His viewpoint is contrast to Wagner’s Law. Keynes states that government expenditure is an exogenous factor. Government expenditure is a tool of policy instrument to stimulate the ECNG (Pinder, 2017). From his perspective, PEX will contribute positively to ECNG. If a government spend more, it will give multiplier effects on aggregate demand. Keynes suggests that government could increase the economy during economic downturns by lending money from the private sector (Fawwaz, 2016). Few scholars found that Keynesian hypothesis explained the impact of GSP and ECNG. For example, Pinder (2017) and Ajayi and Aluko (2016). Ajayi and Aluko (2016) examines the impact of real government expenditure and real money supply on Thailand aggregate real output or real GDP from year 1993 to 2006. Using Granger causality test, the result shows that aggregate government expenditures cause ECNG.

On the other hand, Pinder (2017) tests the US federal government data to find a clear result about the impact of GSP on ECNG. The sample of the data is from year 1947 to 2002. The data includes human resources, national defense, physical resources and other expenses, and also net interest payment. The outcome shows no causal relationship between GDP and national defense expenditure. National security does not affect the economy activities. There is also two-way direction causality between physical resources, net interest payment and ECNG.
However, unidirectional causality occurs between human resources and other expenditure and ECNG. The causality runs from human resources expenditure to GDP and GDP to other expenditure. The results more consistent to support Keynesian’s theory. Fasoranti (2015) investigates the impact of government expenditure on ECNG in Malaysia by comparing two hypotheses; The Wagner’s Law and Keynesian hypothesis. The data of real GDP and real government expenditure are obtained from World Development Indicators (World Bank) from year 1960 to 2005. Using time series technique, the result shows that Granger’s non-causality tests have two-way causal relationship between government expenditure and ECNG. His study also supports both Wagner’s Law and Keynesian law in Malaysia.

The study of Fawwaz (2016) shows that government expenditure on education is the most crucial spending in Nigeria. They suggest that the government should be focus more on education expenditure for the country. Odhiambo (2018) confirms that only Philippines has unidirectional causality from government expenditure to national income.

2.1. Theoretical Review

In order to empirically analyze ECNG-government expenditure relationship in Malaysian economy, Fasoranti (2015) provided detailed explanation of Keynesian and Wagnerian hypothesis. Wagner’s Law which is also termed as the Law of increasing state spending is a classical approach which suggests that GSP constantly increases with higher levels of ECNG. Here GSP considers as an economic progress outcome and is taken as endogenous factor. Thus, according to Pinder (2017), PEX is assumed to be a consequence or outcome resulting from economic activities. In addition, a few other studies Jakovljevic (2016) also attempted to discover the nature of ECNG and GSP relationship, through performing times series analysis. Author tried to capture whether PEX affects ECNG of Sudan, during 1970-2010, similarly the effects on Taiwan, South Korea, USA, Thailand, Japan, and UK’s ECNG were studied by Wang, Li, and Fang (2018) for the period of 1951-1996; in addition, the long-run national income growth and public spending relationship is also examined by Jakovljevic (2016) for G7 economies, which includes Italy, France, United States, Japan, Canada, Germany, and United Kingdom. They obtained data for a period of 1960-1993. Thus, all the above studies obtained findings that were consistent with the Wagner’s Law.

Contrarily, the Keynesian macroeconomic theory states that GSP increases the national income and ECNG, therefore implying that public spending granger cause country’s ECNG, running from GSP to the economic activities. The Keynesian theory advocates that ECNG is the resultant outcome of government expenditure, which is inconsistent with the Wagner’s Law. Moreover, Keynes considered government expenditure as the external factor. Thus, according to Pinder (2017), GSP is one of the policy instruments for achieving desirable level of ECNG. According to Keynesian theory, PEX positively contributes to the ECNG, such that more GSP will boost aggregate demand and output through multiplier effects. In addition, it has also been suggested that during economic downturns, government can play its role by lending from external sources or from the private sector to expand the economic activities. Afterwards, money is sent back to private sector by initiating spending programs. Thus, higher GSP tends to increase profitability, investment, and employment (Fawwaz, 2016; Njegovanic, 2018).

Few scholars found that Keynesian hypothesis explained the impact of GSP and ECNG. For example, Pinder (2017) examines the impact of real government expenditure and real money supply on Thailand aggregate real output or real GDP from year 1993 to 2006. Using Granger causality test, the result shows that aggregate government expenditures cause ECNG.

On the other hand, Pinder (2017) tests the US federal government data to find a clear result about the impact of GSP on ECNG. The sample of the data is from year 1947 to 2002. The data includes human resources, national defense, physical resources and other expenses, and also net interest payment. The outcome shows no causal relationship between GDP and national defense expenditure. National security does not affect the economy activities. There is also two-way direction causality between physical resources, net interest payment and ECNG. However, unidirectional causality occurs between human resources and other expenditure and ECNG. The
causality runs from human resources expenditure to GDP and GDP to other expenditure. The results more consistent to support Keynesian’s theory. Fasoranti (2015) investigates the impact of government expenditure on ECNG in Malaysia by comparing two hypotheses; The Wagner’s Law and Keynesian hypothesis. The data of real GDP and real government expenditure are obtained from World Development Indicators (World Bank) from year 1960 to 2005. Using time series technique, the result shows that Granger’s non-causality tests have two-way causal relationship between government expenditure and ECNG. His study also supports both Wagner’s Law and Keynesian law in Malaysia.

By using a time-series and cross-sectional data for 43 developing economies for 20-years i.e. during 1970-1990, Naseer (2019) added defense expenditures, total central government expenses (both capital & current), transport, health, communication and education as the set of independent variables, whereas the average of five-year forward moving per-capita real GDP growth is included in the study as the dependent variable. Hence, the results indicate significant positive association among ECNG and share of current expenditure.

However, a few researchers such as, Nishiyama (2019) and Ajayi and Aluko (2016) advocated that GSP does not positively contributes to the ECNG. Ajayi and Aluko (2016) attempted to examine whether actual human capital creation and ECNG are affected by government expenditure on human capital, in health and education sectors. For this purpose, he incorporated a cross-sectional data of 84 non-Communist developing economies and reported that no significant relationship is found among ECNG and GSP on human capital, in addition, limited impact is observed for GSP on the actual health and education level. Similar findings were obtained by another study (Okon, 2017; Nishiyama, 2019), who employed Granger causality test for determining the nature of causality between real per capita GDP growth rate and GSP in GDP, and used time series analysis for the statistical estimation. The results of Vector Autoregressive (VAR) model indicated that GSP has no significant impact on the per capita real output growth. It has also been suggested in this study that the deficits in Saudi Arabia are generally handled by reducing the governments’ size and by minimizing its activities in the economy (Abdul Hadi et al., 2019).

Contrarily, a negative relationship is found in few other studies (Donou-Adonsou, 2019; Ruiz, 2018) among ECNG and government expenditure. In an attempt to observe the empirical regularities in post-war ECNG, Ruiz (2018) included 113 economies and employed a set of cross-sectional and time series data for these economies. The results indicate that there exists significant negative association among ECNG and GSP. However, for Central and South America and Africa, negative correlation is obtained for economic development and political repression. In another study, Donou-Adonsou (2019) employed the data for 98 economies, for a period of 1960-1985 and reported significant positive political stability and ECNG relationship, and a negative association between a proxy variable for market distortions and economic development. Pastor (2019) conducted a research including 24 economies to make a comparison of the public and private investment effects on the ECNG of these economies, during 1970-1979. It is found that ECNG has a relatively larger influence of private investment as compared to public investment. Although, ECNG has positive indirect influence of public investment. The infrastructural spending, such as, electricity, schools, telecommunication, and roads strongly influence the private capital formation.

Scholar examined whether any positive or negative association exists among domestic investment, foreign direct investment, ECNG, and savings, and included the data of 16 Sub-Saharan African (SSA) economies, during 1981-2011. The study employed Granger causality test and VAR estimation analysis and found a one-way causality i.e. from FDI to domestic investment, and ECNG and from savings towards the ECNG, whereas, a two-causality is also observed among domestic investment and growth and domestic investment and savings. Thus, these findings indicate that growth plays a significant role in explaining FDI, savings for explaining domestic investment and the significant role of domestic investment in explaining savings pattern. Besides, the study by Sekantsi and Kalebe (2015) also examined the cause and effect relationship among savings, investment and ECNG, in Lesotho for a period 1970-2012, by employing Granger causality test, ARDL and VECM. Results of this study confirmed that ECNG granger causes savings in the short-run and in the savings does granger cause ECNG. In addition, a bidirectional causality is also observed among investment and ECNG.
By using various statistical techniques for obtaining empirical evidence, researchers supported that trade has a significant positive impact on ECNG. Therefore, to analyze the association among trade, ECNG (per capital GDP) and FDI in Bangladesh, Hussain and Haque (2016) used the data for 1973-2014 to perform VECM analysis. The result of the statistical analysis has shown that positive relation exists between trade and FDI and ECNG. Furthermore, for analyzing the trade-ECNG linkage in Peru, Argentina and Columbia, Fapetu and Owoeye (2017) also performed a Granger causality test and reported that these economies are based more upon the import-based growth as compared to export-based growth. It has also found one-way causality between trade and GDP, running from GDP to imports and exports. Another study Hakimi and Hamdi (2016) also tried to investigate the trade-ECNG relationship by using the data for 100 developing and developed economies for the time period 1970-1997, and employed a panel data approach for the statistical estimation. The findings revealed significant positive effects the trade barriers pose on the ECNG, particularly in developing economies.

In addition, You (2017) performed the multivariate causality tests for investigating the imports and exports and FDI’s impact on GDP in 9 Asian economies including Indonesia, Hong Kong, India, South Korea, Singapore, Malaysia, Philippines, Taiwan and Thailand, using a VECM analysis. The study revealed a bidirectional causality among FDI, growth and trade in most of the countries involved in this study.

On the other hand, author has failed to find any cause and effect relationship between domestic savings and ECNG in Cambodia during 1989-2012. Besides, the study also used the unit root test. Therefore, to observe how savings influence ECNG in five Asian economies, including South Korea, Thailand, Singapore, Philippines, and Malaysia, (Liew & Tang, 2019) employed the data for the time period 1960-1997 and applied the time series analysis. The results obtained from Granger causality test indicated no causality from savings to ECNG, however, a causality from foreign savings to domestic savings was found in the long-run. By employing a Johansen cointegration technique, Nwanne (2016) attempted to examine whether the savings pattern in Nigeria influenced its ECNG, during 1970-2007, and concluded that savings and ECNG are cointegrated. Results have also shown that ECNG granger causes savings that implies, the higher the ECNG the greater will be the savings. Another empirical research conducted by Shubita (2015) applied an ARDL approach to identify the ECNG-savings relationship for Tunisian economy, for a period of 1961-2007, and in Morocco during 1965-2007. He found long-run association and bidirectional causal relationship among savings and ECNG in Morocco, and one-way causal relationship exists which runs from savings to GDP in Tunisia.

Wagner’s Law was first introduced more than a century ago. Many researchers agree with Wagner’s Law. However, there are scholars who support Keynesian theory. Fasoranti (2015) has both empirical support of Wagner’s Law and Keynesian view in Malaysia. Findings about the relationship between government expenditure and ECNG is also different among scholars due to data selection, methodological differences and estimating procedures. Since many researchers used time-series technique, this study provides panel data approach to give more understanding about the significant relationship between public spending and economic development for ASEAN-5 countries. Previous studies also show different findings about the impact of other macroeconomic variables such as capital formation, portfolio investment, labor force, trade, total reserve and savings on ECNG.

### 3. Measurement

The empirical analysis of this study uses annual data on ASEAN-5 countries from year 1990 to 2014. The countries are Thailand, Singapore, Indonesia, Philippines and Malaysia. The basic data source of this study is World Development Indicators from the official website of the World Bank. By using balanced panel data, the dependent variable of the study is gross domestic product (GDP). GDP is used to measure the ECNG. This study provides three models of the research. All models use GDP as dependent variable. For Model there are five independent variables; government expenditure, gross capital formation, portfolio investment, labor, trade, total reserve and gross savings.
At purchaser’s price, the GDP is measured in US dollars which is the aggregate gross value added of all home country producers by including the product taxes and by excluding any subsidies that should be added in products’ value (World Bank, 2017; OECD National Accounts, 2017). It is generally measured without excluding the cost of depreciation for any fabricated assets and the cost for natural resource depletion. By using official exchange rate for only one year, the domestic currency figures are converted into dollars.

The current study used general government’s final consumption (in terms of US dollars) in order to determine the total GSP. The term was initially known as a general government consumption, which comprises of the current GSP on goods and services plus employees’ compensation expenses, and the expenses on national security and defense, minus the expenses on government military (OECD National Accounts data, and World Bank database, 2017). The aim of this research is to investigate whether there is positive relationship existing among ECNG and government expenditure.

The term Gross capital formation, initially termed as the gross domestic investment is comprised of expenditures other than the fixed assets plus the net changes in inventories, where the inventories refer to product stocks that are kept by firms in order to deal with unexpected or temporary fluctuations in sales or production and the fixed assets accounts for the plant, equipment purchases, machinery, construction of railways, schools, hospitals, offices, private residence, industrial and commercial buildings, and land improvements.

This study also included portfolio investment which involves transactions of debt and equity securities and is measured in US dollars. Therefore, a positive relationship is expected to exist between ECNG and portfolio investment. Labor force includes all the population with ages 15 and above, and who satisfies the definition proposed by International Labour Organization, i.e. all individuals who are economically active or supply labor in the goods and services production, during a certain time period. Labor force also includes first-time job seekers, armed forces and the unemployed, however, it excludes unpaid caregivers, informal sector employees, and homemakers (International Labour Organization, 2017).

Moreover, the trade represents the aggregate of imports and exports of goods and services and is taken as a percentage of GDP (OECD National Accounts data files, 2017; World Bank, 2017). A surplus or positive trade balance of a country indicates that the exports value exceeded the imports value, whereas, a negative trade deficit or trade balance indicates that the value of imports is greater as compared to the value of exports (Focus Economics, 2017). Therefore, a country’s gross savings are measured as the total gross national income (GNI), by including net transfers and excluding total consumption.

The main objective of the study is to determine the impact of government expenditure on ECNG for ASEAN-5 countries. The countries involved are Thailand, Singapore, Indonesia, Philippines and Malaysia. It also investigates the impact of other macroeconomic variables on ECNG for ASEAN-5 countries. The variables are gross capital formation, portfolio investment, labor force, trade, total reserve and gross savings. The data was obtained from year 1990 to 2014. This study shows that government expenditure does have positive significant impact on ECNG. All macroeconomic variables, such as gross capital formation, portfolio investment, labor force, total reserves and gross savings also have positive relationship with ECNG. Only trade has negative significant impact on GDP. The findings are parallel with previous empirical studies of Ayinde et al. (2015) and Mohammadi and Ram (2015).

4. Data

The empirical analysis of this study uses annual data on ASEAN-5 countries from year 1990 to 2014. The countries are Thailand, Singapore, Indonesia, Philippines and Malaysia. The basic data source of this study is World Development Indicators from the official website of the World Bank. By using balanced panel data, the dependent variable of the study is gross domestic product (GDP). GDP is used to measure the ECNG. This study provides three models of the research. All models use GDP as dependent variable. For Model 1, there are seven independent variables; government expenditure, gross capital formation, portfolio investment, labor,
trade, total reserve and gross savings. Model 2 and Model 3 have five independent variables; government expenditure, gross capital formation, labor, total reserve and gross savings.

5. Econometric model

The following model is used to investigate the impact of government expenditure, gross capital formation, portfolio investment, labor force, trade, total reserve and gross savings on gross domestic products. The equation is presented as follows:

\[
GDP = f (GEXP, GCF, PI, LBR, TRD, TRSV, GSV) \ldots(1)
\]

where, GDP is Gross Domestic Products, GEXP is Government Expenditure, GCF is Gross Capital Formation, PI is Portfolio Investment, LBR is Labor Force, TRD is Trade, TRSV is Total Reserves and GSV is Gross Savings. GDP is the dependent variable and other variables are independent variables. The econometric models of GDP function are shown as follows:

\[
Y = \beta_0 + \beta_1 X_1 \ln X_1 + \beta_2 X_2 \ln X_2 + \beta_3 X_3 \ln X_3 + \beta_4 \ln X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \epsilon \ldots(2)
\]

For Model 1, the econometric model is:

\[
LGDP = \beta_0 + \beta_1 \ln (GEXP) + \beta_2 \ln (GCF) + \beta_3 \ln (PI) + \beta_4 \ln (LBR) + \beta_5 \ln (TRD) + \beta_6 \ln (TRSV) + \beta_7 \ln (GSV) + \epsilon \ldots(3)
\]

where, GDP is Gross Domestic Products, GEXP is Government Expenditure, GCF is Gross Capital Formation, PI is Portfolio Investment, LBR is Labor Force, TRD is Trade, TRSV is Total Reserves, GSV is Gross Savings, \( \epsilon \) is the error term and \( \ln \) is the natural logarithms.

For Model 2, the econometric model is:

\[
LGDP = \beta_0 + \beta_1 \ln (GEXP) + \beta_2 \ln (GCF) + \beta_3 \ln (LBR) + \beta_4 \ln (TRSV) + \beta_5 \ln (GSV) + \epsilon \ldots(4)
\]

where, GDP is Gross Domestic Products, GEXP is Government Expenditure, GCF is Gross Capital Formation, LBR is Labor Force, TRSV is Total Reserves, GSV is Gross Savings, \( \epsilon \) is the error term and \( \ln \) is the natural logarithms. For Model 3, the econometric model is:

\[
GDP = \beta_0 + \beta_1 (GEXP) + \beta_2 (GCF) + \beta_3 (LBR) + \beta_4 (TRSV) + \beta_5 (GSV) + \epsilon \ldots(5)
\]

where, GDP is Gross Domestic Products, GEXP is Government Expenditure, GCF is Gross Capital Formation, LBR is Labor Force, TRSV is Total Reserves, GSV is Gross Savings and \( \epsilon \) is the error term.

The pretesting problem that is indirectly involved in the cointegration analysis can be avoided by the ARDL approach. There is no priori exogenous and endogenous division of variables in the model. Likewise, zero restrictions are not forced and no strict theory of economic in which the model is developed. In addition, a dynamic ECM can be derived from this approach through a simple linear transformation. However, to illustrate ARDL model approach, this model is considered.
6. Results

The results of the correlation test between dependent variable and independent variables proved to be very useful in pre estimation analysis especially as regards potential relationships suggested by theories. Therefore prior to the econometrics analysis, the statistical correlation of the variables are examined which helped in determining the statistical relationships between and amongst the variables.

Table 1. Correlation Analysis

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GEXP</td>
<td>0.830**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GCF</td>
<td>0.257**</td>
<td>0.243**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LBR</td>
<td>0.810*</td>
<td>0.118**</td>
<td>0.829*</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TRSV</td>
<td>0.145**</td>
<td>0.463*</td>
<td>0.129</td>
<td>0.579*</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>GSV</td>
<td>0.130*</td>
<td>0.247**</td>
<td>0.828</td>
<td>0.674*</td>
<td>0.882</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 2 summarize the results of GDP, export models respectively based on the selected ARDL models. An ARDL (1, 0, 0, 1, 1, 1, 0, 1) was chosen for the GDP model. The results of R2 (78.7%), the adjusted R2 (65.9%) in Table 2 along with the F-statistic for GDP equation model show that the model obtained best goodness of fit and variations of the selected independent variables explained certain the changes of the dependent variable. The significance of the F-statistics test justifies the inclusion of all the explanatory variables existing in the GDP model.

Table 2. Optimal ARDL Model Selection

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficients</th>
<th>Standard Error</th>
<th>t-statistics</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEXP</td>
<td>0.415</td>
<td>0.142</td>
<td>2.922</td>
<td>0.008*</td>
</tr>
<tr>
<td>GEXP(-1)</td>
<td>0.455</td>
<td>0.147</td>
<td>3.090</td>
<td>0.006*</td>
</tr>
<tr>
<td>GCF</td>
<td>0.000</td>
<td>0.000</td>
<td>2.427</td>
<td>0.024*</td>
</tr>
<tr>
<td>LBR</td>
<td>0.000</td>
<td></td>
<td>5.938</td>
<td>0.000*</td>
</tr>
<tr>
<td>LBR(-1)</td>
<td>-0.477</td>
<td>0.137</td>
<td>-3.498</td>
<td>0.002*</td>
</tr>
<tr>
<td>TRSV</td>
<td>0.001</td>
<td>0.001</td>
<td>2.202</td>
<td>0.003**</td>
</tr>
<tr>
<td>GSV</td>
<td>0.023</td>
<td>0.043</td>
<td>3.526</td>
<td>0.000</td>
</tr>
<tr>
<td>GSV(-1)</td>
<td>0.065</td>
<td>0.037</td>
<td>1.763</td>
<td>0.092**</td>
</tr>
<tr>
<td>C</td>
<td>7.406</td>
<td>2.882</td>
<td>2.570</td>
<td>0.018*</td>
</tr>
<tr>
<td>T</td>
<td>0.045</td>
<td>0.009</td>
<td>4.731</td>
<td>0.000***</td>
</tr>
</tbody>
</table>
Findings about the relationship between government expenditure and ECNG is also different among scholars due to data selection, methodological differences and estimating procedures. This study uses panel data approach from year 1990 to 2014 for ASEAN-5 countries. The findings are discussed in chapter four. The future research is expected to explore different methods to confirm the reliability of the model. From this study, there is evidence that government expenditure does have impact on ECNG. Future research is expected to expand the investigation to other composition of GSP such as education, defense and infrastructure expenditures instead of using general government final consumption expenditures.

7. Conclusion

The issue of GSP and ECNG is crucial for developing countries. As mentioned by Odhiambo (2018) the public sector usually uses a relatively large share of society’s economic resources. The government of a country need to spend more on regulations as the urbanization and economic development increase. The allocation of GSP is also important on certain services such as cultural and welfare. These services are considered as high-income elasticity. The GSP may contribute positively to ECNG through its interaction with the private sector. The government provides large-scale capital expenditures since the private sector does not have the capacity to provide the funds; as stated by Pradhan et al. (2015). Increase in government consumption may increase in employment, profitability and investment of a country. GSP is increasing over the years. Naseer (2019) conclude that productive PEXs may become unproductive if misallocating and using it in excess. Evidence from Kurniawan (2016) shows that fiscal stimulus does contribute to rapid economy recovery in the ASEAN-5 countries after the financial crisis in 2008. The GSP of ASEAN-5 countries on infrastructure is the major contribution to increase the overall investment and ECNG. Thus, ASEAN Blueprint 2025 is implemented to integrate the regional economic agenda for ASEAN countries. ASEAN governments are expected to spend productively with closely monitored implementation of AEC Blueprint 2025 towards a healthy economic development.

This paper examines the impact of public spending on ASEAN-5 countries economic development. The purpose of this study is to provide evidence, reference and contribute to the knowledge about GSP and ECNG. It is expected to clarify the importance of fiscal policy and other macroeconomic variables in strengthening the economy for ASEAN-5 countries. A clear understanding about inter-linkages between GSP and ECNG will help the government in making better decision for the country. As ASEAN countries have responsibility for ASEAN Economic Community (AEC) Blueprint 2025 to meet its objectives, ASEAN governments are expected to effectively monitor the public spending as fiscal instrument in stimulating ECNG. Government expenditure may become unproductive if misallocating and using it in excess, as suggested by Naseer (2019).

A clear understanding about inter-linkages between GSP and ECNG will help the government in making better decision for the country. As ASEAN countries have responsibility for ASEAN Economic Community (AEC) Blueprint 2025 to meet its objectives, ASEAN governments are expected to effectively monitor the public spending as fiscal instrument in stimulating ECNG. Government expenditure may become unproductive if misallocating and using it in excess, as suggested by Naseer (2019). Findings about the relationship between government expenditure and ECNG is also different among scholars due to data selection, methodological differences and estimating procedures. This study uses panel data approach from year 1990 to 2014 for ASEAN-5 countries. The future research is expected to explore different methods to confirm the reliability of the model. From this study, there is evidence that government expenditure have impact on ECNG. Future research is expected to expand the investigation to other composition of GSP such as education, defense and infrastructure expenditures instead of using general government final consumption expenditures.
References


582


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PREDICTING PLAUSIBLE THREATS: IMPACT OF GLOBALIZATION PATTERNS ON NATIONAL ECONOMIES

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Abstract. Relevance: With the increase of permeability of borders, in the conditions of active political interaction between regions, it became regular to witness appearance of many transnational companies (TNC) and metacorporations differing in forms of management and organizational connections. Where in the case of transnational companies we can most often observe trade expansion with the pushing out of the competitors working on the local market, the pattern more characteristic of metacorporations is merger and acquisition (MAA) where the management of the holding (as a rule) signs contracts with local manufacturers increasing their production capacity at the expense of local productions and businesses. The aim of this paper is to track the dynamics of international business development in the conditions of globalization and find out which regions and spheres of business are currently considered the most preferable for foreign investment. The results gained can be used in planning of perspective outlet markets and in search of new collaboration objects. The novelty of this paper lies in the observed character of interdependence of national economies and redistribution of investment flows between regions. The conclusions were made, that foreign investment flows (FIF) significantly influence the development of business inside the country: businesses with foreign capital receive a number of benefits compared to local companies.

Keywords: globalization; transnational companies (TNC); foreign investment flows (FIF); merger and acquisition (MAA); competition.


JEL Classifications: F62, O19, G17.

1. Introduction

Integration processes of modern world economy contribute to development of globalization (Luk’yanenko, 2001; Zeibote et al., 2019; Masood et al. 2019; Kiseľáková et al., 2018; Koval et al, 2019). At the same time, we cannot look at processes of economy globalization and intensification of international business separately – the degree of expressiveness of economic globalization in the region is directly proportional to the volumes of international trade and the amount of transnational companies represented in the region by their affiliates or manufacturing site.

By the term “economy globalization” we broadly mean rapid increase in commodity turnover, investment and credit flows, information, staff and ideas among certain countries, as well as increase in the geography of their influence. With the increase in speed of inter-penetration of such flows, national economies of the countries involved in this process gradually become inter-dependent. As a result of close economic interaction, many elements of national economic institutes integrate into common economic field and become one of components of global economy (Ad Fad, 1992)
To track the development rate of economic globalization, we can compare the ratio between sales volumes and production volumes – over the last 50 years global trade growth dynamics considerably outruns global production growth rate. “Between 1950 and 2000 the world trade volume increased more than 20-fold whereas inflation-adjusted world GDP increased only a bit more than 6-fold” (Iskrenko, 2003), or capital flows from one country to another (Tvaronavičienė 2019).

For countries with developing market economy (according ratings of international organizations it’s 35 countries including members of G7), integration into common economic space is one of main ways to avoid stagnation. This is connected primarily with the search for new outlet markets. In the context of international trade growth, economic globalization becomes inevitable (World Bank, 2013).

2. Literature review

The tendencies of international business development were first studied by A. Smith as far back as 2nd half of the 17th century. With the advent of the industrial revolution in England this issue became especially relevant. “If any foreign country can supply us with the product at a cheaper price than we ourselves are able to produce, it is much better to buy it from them for a certain amount of our own product which is applied in the sphere where we have certain advantage.” (Kislova, 2014).

Economic globalization had taken its final shape by the end of the 20th century. By this time a number of multinational corporations had already appeared on the international market. Their example can be used to look at formation principles of transnational commercial corporations.

Many authors combine the terms “multinationalism” and “globalization” into one notion. However, in spite of a number of common features, these are different forms of business. Multinational corporations use ultimately different strategies of conducting a business for every country of presence, whereas global companies use only one business blueprint for all regional markets. (Jameson, 2000).

It is the activity of multinational corporations that contributed to the development of transnational economy in the form we can witness today. It turned into a sort of “world chess board” on which leading international companies compete (Movsesyan, 1997).

Global transnational economy formation features

Globalization of economy happens gradually, methodically involving in its field new countries and regions. We can witness global transnational economy formation in these features:

- Development of unified international scientific informational space and communication systems;
- Development of world financial market functioning on the basis of computer communication technologies;
- Increase in the interaction and interconnection of economies of separate countries and regions;
- Reorganization of commercial corporations for more efficient work in the format of international trade;
- Appearance of inter-state production corporations with placement of production sited in different countries;
- Increase in speed and volumes of international transactions: investments, credits, etc
- Merger of economies of separate countries and whole areas of industry with supernational corporations
- Appearance of many supernational structures of business control, formation of multilateral coordination contracts
- Cultural unification – global semination of unified cultural values and standards (partially smoothed out in the process of glocalization)
- Expansion of any economic factors at a global scale: shared crisis phenomena, shared prices and currency rates.
Goals

Conducting international business gets complicated because of a wide range of threats of various character (Joshi, 2009; Masood et al., 2019; Moumen et al., 2019; Rezk et al., 2019; Mikhailov et al., 2018; Nikitina et al., 2018; Škufilić et al, 2018; Filipishyna et al., 2018; Kalyugina et al., 2018; Tvaronavičienė 2019; Abdullah et al, 2019, Cristiano Freitas Gomes et al., 2019; Olayinka A. Abiodun et al., 2019; Veli Sibiya., & Tumo Kele 2019; Schwarz 2018; Energy Transformation towards Sustainability, 2019; Gagarina et al. 2019; Ohotina et al. 2018; Tvaronavičienė et al. 2018).

However, it is international business that serves as the primary stimulus for economic globalization. In this paper we will identify the most perspective areas of international business, identify regions and countries that enjoy the most popularity among foreign investors, and identify the most important factors that can influence the success of international business.

3. Methodology

We used these data sources:

- International reports on 2009-2017 world investments.
- Analytical summaries of Forbes, PwS, IMF
- Financial reports of large transnational companies available to public access
- Scientific reports of national and foreign scientists dedicated to economic globalization issues
- Statistics data, reports of rating agencies, news sources

Based on statistics data and reports, we can make a relevant prognosis of international business development for the next 1-2 years. As the basis for the research, we used search and selection of authentic information, analysis of factual data and description of objective dynamics of international market, data systemization and comparison of TNC distribution picture by regions.

4. Results of the Study

Dynamics of international business development in the conditions of globalization

Economic globalization benefits active business development. By limiting itself to internal market of only country the business needs to compete with representatives of their own country and import companies. This often leads to decrease in consumption value of products or services. At the same time, we should not exclude the possibility of price damping initiated by large international companies present on the local market.

Expansion to international level, in its turn, lowers the degree of competition. When tapping into new markets, a business can face absolutely empty or scarcely filled niches where its product would be much more in demand than in the country of production. In these conditions the producer can dictate the prices that are most beneficial for them and go on increasing their income. It will not be difficult for a large global company to drive out competition even from a fully formed market – competitors are eliminated by lowering prices, and the profit (avoid losses) is reached by means of regions with less competition. As a result, having eliminated the competition, the business can gradually set more profitable prices.

Theoretically, business can expand in any direction. However, in practice, company marketing experts take their time to design development strategies, since a potential outlet market is assessed by a number of criteria: GNP indexes, life standards as a whole, demographic situation, fund distribution structure (social stratification), political stability. To assess economic status of the country the World Bank often uses statistical reports where currency rate fluctuations within a period of 2-3 years are reflected, as well as inflation dynamics for the same period (Jameson, 2000). Choice in favor of a certain market is made based on the combination of factors.
Given that, countries with a low but uniform GNP distribution among the population are always more attractive for TNCs than countries with high GNP and distinct social stratification.

Lowering production cost of the product is an additional advantage of globalization for large business. Having presence in several markets at once, the business increases production rates, gradually lowering expenses for each unit of product. A vivid illustration of this pattern is company Warner-Lambert, one of the largest world producers of pharmaceutical products. According to calculations of company analysts, the expenses for development and marketing of each new product are over 230 mln dollars (UNCTAD, 2017). Keeping the product price consumers find attractive while fully covering expenses is only possible in the conditions of globalization, i.e. when the product is successfully sold on many markets.

In most cases global companies easily tap new markets. This is due to the company using proven marketing schemes in the new region. To promote products no special expense is necessary, while production volumes and profit increase proportional to volumes of new markets.

A good example is Coca-Cola Company, one of the largest world producers of soft drinks. The company first came to market in 1886, and it took the management 22 years to produce (and sell) their first billion bottles. Today, having transformed into a global company with representative offices in 195 countries, the company sells the same amount of product in 1 day! (Official website of Coca Cola, 2018).

Coca-Cola example can help us trace transformation of global marketing selling one and the same product. In the earlier days, companies used to develop a marketing project primarily for the internal market, and only afterwards would they adapt it to foreign markets. Today, marketing experts of transnational companies first develop universal solution for the global market and only afterwards make necessary corrections depending on the culture and traditions of each region separately (Ad Fad, 1992).

Alongside the economic globalization in the sphere of trade itself, we can witness pronounced processes of glocalization in the marketing sphere. The main task for marketing experts is to sell the product with minimum marketing expense. In such conditions creating one marketing product with further set of adaptations looks cost-efficient than creating a whole set of marketing projects.

One of the perfect examples of efficient marketing is Procter & Gamble. (Official website of Procter & Gamble, 2018). Procter & Gamble ranks 12th in the list of the largest US companies. The company is the leader in their sphere on the world scale. It is the foreign operations (up to 53% of all sales) bring them maximum profit – around $ 15.9 billion per year.

5. Case studies

It is worth noting that the biggest percentage of large international company belongs to countries with developed market economy. Having developed a competitive product and tried out proven marketing schemes on the internal market, a corporation successfully expands its sphere of influence to neighboring regions. Russian business has not yet reached such level of development, so the tendency to globalization is only working on import on the local market so far.

Low globalization speed of Russian business is conditioned primarily by historical reasons. After the “iron curtain” fell and several re-organization waves came, local producers could not decide on their priorities for a long time and would make the products by outdated standards. The absence of competitive products and high production cost of local products is the main reason why Russian business does not yet have perspective in the foreign market. According to the information from the Global Competitiveness Report, as of beginning of 2017 Russia was ranked 43rd among 138 positions (Gerasimov et al., 2018). Over the last several years there has emerged a trend to tighten quality control of local products, yet Russia risks playing exclusively the role of receiving party on the global market for quite some time with the existing level of production (Akhmetshin and Osadchy, 2015).
Investments from the outside could level the situation and give Russian businesses a chance. And we are talking not only about financial investments, but also about technical re-equipment, new ideas and concepts. However, for foreign investors Russia is not very interesting. As a country with transitional economy, the Russian Federation has long been associated with high investment risks while investment conditions are strictly regulated on the state level. For example, one of early legislative drafts “National Security Policy of the Russian Federation (1996-2000)” suggested in 1996 by the office of the secretary of Security Council of the Russian Federation interpreted the possibility of “intensive buying-up of Russian businesses by foreign companies, especially at the lower price” (Politika natsional'noy…, 1996) as a threat. This draft was developed to protect of Russian businesses and lower the level of corruption, yet in reality it created a number of complications for foreign investments since real cost of stocks does not always correspond to the declared one.

As a result of a complex political and economic situation, globalization level in the Russian Federation remains in its infancy, and the country stays in the role of the receiving party on the world market (Table 1).

<table>
<thead>
<tr>
<th>Countries owning TNCs</th>
<th>Number of TNCs</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>23</td>
</tr>
<tr>
<td>China</td>
<td>11</td>
</tr>
<tr>
<td>France</td>
<td>3</td>
</tr>
<tr>
<td>Japan</td>
<td>5</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>1</td>
</tr>
<tr>
<td>Italy</td>
<td>1</td>
</tr>
<tr>
<td>Germany</td>
<td>3</td>
</tr>
<tr>
<td>Switzerland</td>
<td>1</td>
</tr>
<tr>
<td>Netherlands</td>
<td>1</td>
</tr>
<tr>
<td>Korea</td>
<td>1</td>
</tr>
</tbody>
</table>

*Source: Global 500 2012…, 2017*

In the list of 500 TNCs, Russia is represented by only three corporations whose activity is concentrated around the area of oil and gas extraction and processing. Let us recall that back in 2012 the rating Financial Times Global 500 (Global 500 2012…, 2017) listed 10 Russian companies. And even though their ratings were not that high, the trend to losing positions on the world market is easy to track. At the same time, the dynamics strongly varies even on the example of the last three years. Back in 2015 the leader of national TNCs, Gazprom, PJSC ranked 26, in 2016 – 56, and in 2017 – only 63.

**Principles of international companies’ interaction**

Increase in the number of international companies leads to growth of competition between them. The largest corporations are forced not only to establish collaboration but also share outlet markets. Many world magnates are forced to initiate cooperation with competitor companies. (Can Honda…, 1999).

The result of close interaction between large international companies is entering into strategic alliances and international contracts. Transnational companies (TNC) can differ in form and contents. (Abramova, 2011). Quite often, they consolidate into complex metacorporations which are classified into holdings and non-holdings. (Keller, 1996).

Mechanisms of influence and management inside these corporations are regulated not only by the internal articles of incorporation but also by international investment treaties (IIT) which are entered into between leaders of governments. Considering the influence of foreign capital investments on local economy (Avdeeva, 2010, p.10), more and more countries try to change their investment policies which inevitably reflects on the format
of interaction between TNC members (Gil’ferding, 2011; Akhmetshin et al., 2017).

Among the broad variety of collaboration forms, the most wide spread method is merger and acquisition (MaA). The biggest volume of purchases within MaA belongs to markets of developed countries – the USA, the United Kingdom and Australia. (Zagrebel’naya, 2015). Consolidation of business provides large companies with additional competitive advantages conditioned by increase in the scale of business and the possibility to use scientific and technical achievements of business partners.

The growth of MaA deals trending in 2005 is conditioned by the restoration of stock exchange after the preceding crisis. Total value of deals in 2005 amounted to almost $1 bln, and a considerable part of mergers was international projects (Thomson Reuters, 2015). In the following years the activity of MaA deals saw an abrupt decline which was due to the influence of the world financial and economic crises. In 2010-2013, the situation gradually started to stabilize, and the total volume of deals (international and internal ones) amounted to $3 bln. (KPMG, 2014). We can observe further positive dynamics – the volume of MaA deals went on increasing on average by 30-40% yearly up to 2016. When looking at the process of economic globalization, we can notice that the volume of MaA deals in the world is also rising (Table 2 and 3).

Table 2. Value of international MaA deals in 2010-2016 (bln USD) (UNCTAD, 2017)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>347.094</td>
<td>553.442</td>
<td>328.224</td>
<td>262.517</td>
<td>735.126</td>
<td>868.647</td>
<td>347.094</td>
</tr>
<tr>
<td>Countries with developed economy</td>
<td>259.926</td>
<td>436.926</td>
<td>266.773</td>
<td>230.122</td>
<td>293.062</td>
<td>640.762</td>
<td>794.317</td>
</tr>
<tr>
<td>European Union countries</td>
<td>118.187</td>
<td>184.582</td>
<td>128.270</td>
<td>126.585</td>
<td>174.874</td>
<td>265.255</td>
<td>362.593</td>
</tr>
<tr>
<td>The United Kingdom</td>
<td>60.826</td>
<td>46.060</td>
<td>36.576</td>
<td>32.893</td>
<td>37.323</td>
<td>70.877</td>
<td>250.799</td>
</tr>
<tr>
<td>Asian countries</td>
<td>37.723</td>
<td>55.967</td>
<td>33.360</td>
<td>47.829</td>
<td>97.269</td>
<td>49.919</td>
<td>41.861</td>
</tr>
<tr>
<td>Japan</td>
<td>7.114</td>
<td>4.671</td>
<td>1.791</td>
<td>4.423</td>
<td>6.159</td>
<td>3.065</td>
<td>20.088</td>
</tr>
<tr>
<td>The USA</td>
<td>84.344</td>
<td>146.144</td>
<td>64.752</td>
<td>43.424</td>
<td>14.130</td>
<td>303.981</td>
<td>360.797</td>
</tr>
<tr>
<td>Countries with transitional economy</td>
<td>4.095</td>
<td>32.966</td>
<td>6.825</td>
<td>-54.845</td>
<td>5.708</td>
<td>10.000</td>
<td>5.014</td>
</tr>
<tr>
<td>The Russian Federation</td>
<td>2.882</td>
<td>29.859</td>
<td>7.201</td>
<td>-55.040</td>
<td>5.659</td>
<td>7.224</td>
<td>4.709</td>
</tr>
<tr>
<td>Countries with developing economy</td>
<td>83.072</td>
<td>83.551</td>
<td>54.626</td>
<td>87.239</td>
<td>129.357</td>
<td>84.364</td>
<td>69.315</td>
</tr>
</tbody>
</table>

Source: UNCTAD, 2017

Table 3. Dynamics of MaA in the world (bln USD and percents)

<table>
<thead>
<tr>
<th>Year</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>bln USD</td>
<td>33.7</td>
<td>33.6</td>
<td>44.8</td>
<td>38.3</td>
<td>27.1</td>
<td>37.5</td>
<td>35.3</td>
<td>35.3</td>
<td>30.5</td>
<td>36.9</td>
</tr>
</tbody>
</table>

Source: UNCTAD, 2019
Distribution of investment flows in the conditions of economic globalization

Economy globalization also reflects on the level of foreign investment flows (FIF) into foreign countries. Based on the 2017-2018 results, FIF flows must have risen up to $1.8 tln which is 5% more than the previous year, and in the current year they are expected to rise up to $1.85 tln. Main recipients of FIF in the future remain the United States, China and India.

Table 4. FDI flow in 20 largest receiving countries in 2017-2018.

<table>
<thead>
<tr>
<th>Country</th>
<th>Type of economy</th>
<th>2017 FDI inflow (Billion of dollars)</th>
<th>2018 FDI inflow (Billion of dollars)</th>
<th>2017 Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>Developed</td>
<td>252</td>
<td>277</td>
<td>1</td>
</tr>
<tr>
<td>China</td>
<td>Developing</td>
<td>139</td>
<td>134</td>
<td>2</td>
</tr>
<tr>
<td>Hong Kong, China</td>
<td>Developing</td>
<td>116</td>
<td>111</td>
<td>3</td>
</tr>
<tr>
<td>Singapore</td>
<td>Developing</td>
<td>78</td>
<td>76</td>
<td>5</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Developed</td>
<td>70</td>
<td>58</td>
<td>7</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Developed</td>
<td>64</td>
<td>101</td>
<td>4</td>
</tr>
<tr>
<td>Brazil</td>
<td>Developing</td>
<td>61</td>
<td>68</td>
<td>6</td>
</tr>
<tr>
<td>Australia</td>
<td>Developed</td>
<td>60</td>
<td>42</td>
<td>8</td>
</tr>
<tr>
<td>Spain</td>
<td>Developed</td>
<td>44</td>
<td>21</td>
<td>17</td>
</tr>
<tr>
<td>India</td>
<td>Developing</td>
<td>42</td>
<td>40</td>
<td>9</td>
</tr>
<tr>
<td>Canada</td>
<td>Developed</td>
<td>40</td>
<td>25</td>
<td>15</td>
</tr>
<tr>
<td>France</td>
<td>Developed</td>
<td>37</td>
<td>30</td>
<td>13</td>
</tr>
<tr>
<td>Mexico</td>
<td>Developing</td>
<td>32</td>
<td>32</td>
<td>12</td>
</tr>
<tr>
<td>Germany</td>
<td>Developed</td>
<td>26</td>
<td>37</td>
<td>11</td>
</tr>
<tr>
<td>Italy</td>
<td>Developed</td>
<td>24</td>
<td>22</td>
<td>16</td>
</tr>
<tr>
<td>Indonesia</td>
<td>Developing</td>
<td>22</td>
<td>21</td>
<td>18</td>
</tr>
<tr>
<td>Israel</td>
<td>Developed</td>
<td>22</td>
<td>18</td>
<td>19</td>
</tr>
<tr>
<td>Vietnam</td>
<td>Developing</td>
<td>16</td>
<td>14</td>
<td>21</td>
</tr>
<tr>
<td>Korea, Republic of</td>
<td>Developing</td>
<td>14</td>
<td>18</td>
<td>20</td>
</tr>
<tr>
<td>Russian Federation</td>
<td>Developing</td>
<td>13</td>
<td>26</td>
<td>14</td>
</tr>
</tbody>
</table>

Source: UNCTAD, 2019

According to the opinion of managers of the largest world TNCs, the positive dynamics is expected in the Asian region in regards to which the growth of FIF is expected in the countries of South-East Asia: Indonesia, Thailand, the Philippines, Vietnam and Singapore.

Conclusions

Globalization processes open up perspectives for business, but requires careful planning. A certain number of difficulties can emerge only in receiving countries — foreign companies having experience and resources can eliminate local producers from the market which inevitably impacts the economy of the state. Economic activity of small local companies becomes economically unreasonable — they just can’t compete as equals with transnational holdings. That is why expansion to international market will be beneficial only for producer countries. Foreign investment flows (FIF) significantly influence the development of business inside the country: businesses with foreign capital receive a number of benefits compared to local companies.

Additional financial investments stimulate industry growth forcing owners to look for new outlet markets that inevitably leads to issues of organizing export and strengthening international collaboration. For business representatives, expansion to foreign arena often seems to be the only appropriate way to keep and
increase economic indices, since the demand for the product starts falling after the saturation of the local market, and in order to support former production rates (or intensify them), market expansion is necessary. This pattern is equally justified in both B2B sector and B2C sector. Main distinctions in the development of new trade connections consist in marketing strategies designed for large business owners or ordinary consumer respectively.

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MEDIATION IN CIVIL MATTERS AS AN EXAMPLE OF THE METHOD USED IN LEGAL SECURITY MANAGEMENT AND OPTIMIZATION OF COSTS OF PROCEEDINGS

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Abstract Mediation is an example of one of the alternative methods of resolving legal disputes. Its use is becoming more and more common, and the very idea of using mediation institutions to resolve legal disputes brings many benefits to conflicting parties, which include speed of proceedings or its cheaper costs. On the basis of national legislation, mediation has become a universal institution because it has been regulated in both public and private law. The next step of the legislator was to equip the mediator in civil matters with various methods through which he can conduct mediation proceedings. Therefore, the mediator conducts mediation using various methods aimed at amicable settlement of the dispute, including by supporting the parties in formulating their settlement submissions or at the mutual request of the parties, it may also indicate ways of resolving the dispute which are not binding for the parties. However, the success of mediation is determined not only by the will of the parties, but also by the way the mediator conducts this procedure, which is characteristic of the conflict management formula. In turn, the instruments at the disposal of the mediator in civil matters, in addition to their real impact on increasing the number of mediation proceedings and settlements concluded before the mediator, which is an example of the desired solution, also imply other legal consequences, including optimization of the costs of the process. Therefore, in addition to financial benefits for parties benefiting from mediation by the society, it is worth considering the methods of conducting this procedure in civil matters, which are examples of tools for managing legal security.

Keywords: security; management; mediation; costs and fees


JEL Classifications: O35

Additional disciplines: law

1. Introduction

Inevitable part of any activity is conflicts, which hinder development of any activities (e.g. Kaźmierczyk, Chinalska, 2018; Kazansky, Andrassy, 2019; Vinichenko et al., 2019; Bublienė et al., 2019). Mediation, as a method of settling legal disputes alternative to trial, is an example of a legal institution which, in a normative way, finds its power in nearly every branch of law. It can be applied not only on the basis of private law, that is in civil-law cases, but also under public law (e.g. in criminal cases). In turn, due to the development of this institution in Poland, from June 2017 it is also possible to apply mediation in administrative matters. By virtue of the amendment introduced to the Act of 14 June 1960 The Code of Administrative Procedure, mediation was incorporated into the administrative procedure (Articles 96⁵-96⁶ of the Code), which is a desirable solution, fully embedding the indicated legal institution in the administrative law system. Similarly, progressive changes were made in the Act of 30 August 2002 on proceedings before administrative courts (UPPSA), which also
concern mediation proceedings (articles 116a-116e of UPPSA).

Nowadays, therefore, the relatively broad scope of the use of mediation in Polish legislation makes this institution universal. However, in view of the fact that mediation in civil matters has been in force for over a decade, and that on 1 January 2016 - by virtue of the Act of 10 September 2015 amending certain acts in connection with the promotion of amicable dispute resolution - art. 1832 was introduced to the Act of 17 November 1964 The Code of Civil Procedure (CCP), outlining the methods of mediation, it is worth presenting some reflections in this respect, because this solution is an example of a legal tool that can be successfully used in the subject of managing legal security. In turn how the justification to this law demonstrates, the proposed change was aimed at increasing the effectiveness of mediation procedures and the number of settlements concluded in their course, especially in disputes in which the parties appear without a professional representative.

2. Legal safety management

In the scientific literature, legal security is defined as a kind of state that is achieved by means of a law, in which not only the good life of the individual - but also his interests - are protected as completely and effectively as possible. The above-mentioned definition allows to conclude that this constituted law, in particular universally binding norms, is an example of tools to prevent chaos in relations between individuals, as well as to maintain social order, because they are designed to safeguard life’s goods as well as human interests, mainly through the use of state coercion. In turn, due to the fact that mediation, being an example of a legal institution enabling conflicted parties to independently work out a consensus, and thus resolve the resulting conflict, it can be assumed that chaos in interpersonal relations can be solved not only by applying solutions with state coercion (Jurgilewicz, Dana 2015). In turn, the problem of managing legal security in the considered aspect should be seen in terms of a complex process consisting mainly of public and private entities, including individual persons - in this case, it will also be mediators - activities aimed at achieving specific goals. In the case of mediation, it will therefore be an attempt to resolve the conflict between the parties by means of a settlement, which is to serve the specific tools currently available to mediators in civil matters (Sebenius, 1992).

3. The legal conditions of mediation in civil matters

The development of mediation in civil matters in Poland was initiated primarily by calling Member States during the 1999 European Council meeting to create alternative, out-of-court procedures, followed by the adoption in May 2000 of conclusions on alternative dispute resolution in civil and commercial matters, due to the fact that the establishment of basic principles in this matter is a welcome step towards enabling the proper development and operation of out-of-court dispute resolution procedures in civil and commercial matters, which helps simplify and improve access to justice. In reference to this, the publication in 2002 of the Green Book of the European Commission on alternative methods for settling civil and commercial disputes initiated an international discourse on the need and manner of regulating mediation and other methods of conciliation in Community law. One of the effects of these events was undertaking in 2003 by the Codification Commission for the Civil Code, operating under the Polish Ministry of Justice, works on the institution of mediation as part of the arbitration tribunal problem group, which completed the legislative proposal presented in 2004 before the Polish Sejm, and finally the adoption on July 15, 2005 of the Act of 28 July 2005 amending the Act on the Code of Civil Procedure (CCP) and certain other laws. This Act, however, entered into force only after several months – to be exact, on 10 December 2005 - when mediation was officially instituted in civil procedure. Mediation in the CCP was contained in 16 articles (articles 1831-18315 of the CCP) where it is discussed in detail, although it is also referred to in: art. 981, art. 103§2, art. 1041, art. 2021, art. 2591, art. 436, art. 4452, and art. 5702 of the same Act. Mediation in civil procedure is applicable in civil cases, so it can be successfully used mainly in family, neighbor, economic or consumer disputes. In addition, the introduction of mediation to the CCP has not breached the applicable normative regulation regarding conciliation proceedings (articles 184-186 of the CCP), or the principles of court settlements, with the exception of liquidation of conciliation in divorce cases, replacing it with the possibility of referring parties to mediation when there are views on the maintenance of marriage (art. 436 of the CCP). Mediation is marked by a number of flagship principles, some of which include: voluntariness
(will), confidentiality, impartiality, neutrality, and acceptability. The principle of voluntariness stems from art. 183 §1 of the CCP and is a key principle of mediation, characterized mainly by the free will of the parties to the proceedings not only as regards the consent to join the mediation as such, but also the active participation in it and the possibility of resignation from it at any stage. Although there is a risk of the party being charged with the costs of the process as a result of an unjustified refusal in mediation proceedings, this is nevertheless possible only when the party has previously agreed to mediation. The principle of voluntariness corresponds with the principle of the autonomy of the will of the parties and their conscious participation in mediation, the reason for which it is important that the party is aware of the factual circumstances of the dispute, and even more importantly, of the effects of the settlement before the mediator. The individual, being aware of his or her procedural situation, as well as of the procedural consequences in which he or she participates, will approach mediation with a greater security and certainty, which only reinforces compliance with the principle of voluntariness. In turn, although the voluntariness of mediation is seen as its advantage, in the case of refusal by the party to be subject to mediation or abandoning his or her commitment to the previously concluded mediation agreement, it becomes a certain disadvantage, causing e.g. the extension of the time of resolution of the case, which could be terminated by adjudication (Jurgilewicz, Dana 2015).

Another principle of the mediation process is confidentiality. It stems from art. 183 §1 of the CCP and comes down, mainly, to the obligation of not providing information that was exchanged between the parties to the proceedings - or the party and the mediator - to third parties without the prior consent of the party or parties. This rule is further reinforced by art. 183 §3 of the CCP, which points out that it is irrelevant to refer in the course of proceedings before a court or arbitral tribunal to settlement proposals, proposals for mutual concessions or other statements submitted in the mediation process. The recipient of this principle is, above all, the mediator, because in accordance with art. 183 §2 of the CCP, he or she is obliged to keep confidential the facts learned about the mediation, unless the parties have released him or her from this obligation. In addition, pursuant to art. 259 of the CCP, the mediator must not be a witness of the facts that he or she has learned in the course of mediation, unless he or she has been released from this obligation by both parties. As far as the parties to the mediation process are concerned, despite the fact that the CCP imposes no direct obligation of confidentiality, if such an obligation is included in the mediation contract - or if it is included in the mediation center’s regulations - it would be appropriate to apply art. 72 §1 of the Act of 23 April 1964 The Civil Code. This Act states that if, during the negotiations, the party has made available information subject to confidentiality, the other party must not disclose or pass it on to third parties, nor use this information for his or her own purposes, unless the parties have agreed otherwise (Morek 2007).

Thus, the principle of confidentiality seems to have a significant impact on the popularity of mediation, given that the attempt to reach by the mediator a source of conflict allowing a settlement would not be possible if the parties were afraid that the content of their conversations during mediation would be revealed. Confidentiality is, therefore, a guarantee of the parties’ voluntary accession to mediation, as well as its effectiveness and providing the parties with equal treatment in the course of the mediation process. Other mediation principles, such as impartiality, neutrality and professionalism, refer strictly to the mediator, whose legal status will be analyzed later in this study. At this point, it is worth noting that, pursuant to art. 183 §2 of the CCP, in conjunction with art. 183 §1 of the CCP, mediation in civil cases may be, as a rule, carried out on the basis of a court order sending the parties down the road of mediation (court-ordered mediation) or a contract for mediation concluded by the parties (contractual mediation), whereby such an agreement may also be concluded by expressing consent to mediation in response to a request for it made by the other party. The presented division into different types of mediation allows to distinguish potential initiators of the mediation process. Therefore, initiating mediation can come from both parties, one of them, or as a result of a court initiative, which in practice has the form of court-ordered mediation (Jurgilewicz, Dana 2015).

However, regardless of the basis for initiating mediation, its effectiveness depends on the actual approval of the settlement reached during the course of the mediation proceedings by the court. In accordance with art. 183 §1-3 of the CCP, a report is drafted from the course of mediation, in which data such as: place and time of mediation, first name, last name and addresses of the parties, name and address of the mediator, and the result
of mediation, are included. The report is signed by the mediator, and when the parties have reached a settlement before the mediator, it is either included in the protocol or annexed to it. The parties are obliged to sign a settlement, while the impossibility of signing it is stated by the mediator in the protocol. In turn, submitting signatures under a settlement by the parties constitutes the consent to apply to the court for its approval, of which the mediator is supposed to inform the conflicted parties. The mediator is also obliged to provide the parties with a copy of the protocol. However, the competent court immediately conducts proceedings regarding the approval of the settlement, and if it is enforceable, the court approves it by giving it an enforcement clause; in other cases, it approves it by virtue of the decision made in a closed session. Nevertheless, there is a risk of refusal to issue a declaration of enforceability or approval of a settlement concluded before the mediator, either in whole or in part, if it is contrary to the law or principles of social coexistence or is aimed at circumventing the law, or if it is incomprehensible or contradictory (Jurgilewicz 2018).

4. The mediator and methods of mediation in civil matters

The mediator in civil matters should be an impartial person, which results directly from art. 183 §1 of the CCP. The characteristics of the mediator are also important, given that his or her substantive preparation for conducting mediation increases the success of reaching a settlement by the parties. Therefore, a good mediator will be someone who can create a comfortable atmosphere for parties to engage in dialogue, and more importantly, who can skillfully encourage these parties to exchange relevant information, and consequently, evaluate the chances of the conflict being resolved. The mediator should have solid negotiating skills, and also feel and be able to distinguish between what the parties want to achieve and what they actually can achieve. Particularly important in this aspect is the continuous improvement of qualifications by the mediator and the constant expansion of knowledge, particularly in the field of law and psychology, but also with respect to different ways of negotiation, etc. However, this profile in practice often becomes difficult to fulfill, especially that in the light of national legislation, formal requirements that are imposed on the candidates for mediators are not excessively demanding. According to art. 183 §1-2 of the CCP, a mediator in civil cases can be a natural person with full legal capacity and full public rights, but he or she cannot be a retired judge (Jurgilewicz, Dana 2015).

It is worth noting that at the stage of legislative works, concerns were expressed that too liberal solutions regarding the requirements for candidates for mediators may affect the quality of mediation itself. Nevertheless, the current requirements for the candidates to meet, on the one hand, reflect the civilian principle of the autonomy of the parties’ will (especially regarding the choice of mediator), and on the other hand, they give rise to a risky situation in which mediation is carried out by persons who are either inexperienced or unprepared for this role, which may then undermine reaching a settlement. This is a specific kind of risk because, in accordance with art. 183 §2 of the CCP, the court may refer the parties to mediation only once in the course of proceedings. The current solutions regarding the qualification of candidates for the job of a mediator, which are highly liberal in nature, may sometimes be a disadvantage, especially in economic matters, where the parties are entrepreneurs who would expect professionalism on the part of the mediator conducting their mediation proceedings (Lax, Sebenius 1986).

At the same time, approval should be expressed for the statement that, for the sake of including mediation in the justice system, the qualifications of mediators should not be based solely on their characteristics (understood as personality traits), because it requires from them not only openness and the ability to establish interpersonal relationships, but also a thorough knowledge of mediation procedures and techniques. Therefore, choosing a competent mediator is not just a matter of responsibility for the very party, but it also entails a far-reaching significance for the justice system as a whole. This position closely coincides with the authors view on this issue. The mediator should undergo at least basic training in mediation before being allowed to handle mediation proceedings. In addition, referring still to the mediator’s qualification in civil matters, it should be noted that while the requirement of full legal capacity of such a person does not raise any doubts per se, the requirement of full public rights may indeed give rise to certain problems - not only of legal, but also factual nature. By specifying public rights, the legislator indicated the circumstances connected with their deprivation, which prompts an optional criminal remedy, in the case of sentencing for imprisonment for a period of not less than
3 years for an offense committed as a result of a motive deserving special condemnation. Then, in the case of a decision depriving public rights, the court notifies of this fact, e.g. a public administration body that is competent for the last place of residence or stay of the convicted person. However, since the relevant data are stored in the National Criminal Register (KRK), they are, basically, unavailable to third parties. In practice, therefore, the parties to the mediation process lack the freedom to verify the mediator’s information in the discussed scope, except to receive an appropriate statement from such a person (in so far as they are aware of it) or to request submitting a KRK certificate, which would be a very uncomfortable move both for the parties and for the mediator already at the outset of the proceedings, plus it would generate unnecessary costs and a waste of time (Jurgilewicz, Dana 2015).

Furthermore, it is also not clear how to treat a settlement made before a mediator who has been deprived of public rights. And although it seems rational to hold a view that - despite the alleged violation of the content of art. 183§1 of the CCP - such a statement can be deemed as valid since it is the parties themselves who should decide its content, when considering the wording of the new art. 183’a, which empowers the mediator to support the parties in the formulation of settlement proposals, and even to indicate ways of resolving the dispute, it appears that such a normative gap, due to the procedural prudence of the parties, should be clearly resolved by the legislator. Likewise, the omission of a normative solution regarding the citizenship of a mediator in civil matters seems to be another kind of a legal loophole. The same goes for the participation of the interpreter of a mediator who is a foreign citizen, given that, in accordance with art. 183§1-2 of the CCP, mediation proceedings are implicit and the mediator is obliged to keep confidential the facts that he or she has learned in connection with mediation, unless the parties have released him or her from this obligation. The recipient of this norm is, therefore, the mediator, not his or her potential interpreter. There is also a lack of legible normative guidance, e.g. a judge who is not a Polish citizen and who is not retired can be a mediator because the solution contained in art. 183§2 of the CCP only generally indicates that the mediator cannot be a judge, unless he or she is retired, which also seems too broadly outlined a solution. Due to the fact that the success of mediation depends largely on the mediator, this person is obliged to conduct mediation professionally. It is worth noting that the Social Council for Alternative Methods of Resolving Conflicts and Disputes, operating under the Polish Minister of Justice, developed standards for conducting mediation by the mediator, which were adopted on June 26, 2006. And although they do not constitute a source of universally binding law, nor can they serve as the basis for making legal claims by third parties, they nevertheless provide a specific nature of guidelines and recommendations for mediators. The authors of these standards were guided, in particular, by the following objectives: assisting in the practice of mediation, providing greater security for both mediation parties and mediators, increasing public trust for mediation and assistance to candidates planning to become mediators. Nine main standards are singled out in the content, and it results from them that the mediator should, in particular: ensure voluntary participation in the mediation and settlement process, ensure confidentiality of mediation, have a high level of professional qualifications, be neutral to the subject of the dispute and impartial to the participants of the proceedings, reliably inform the parties about the essence and course of mediation, cooperate with other specialists for the benefit of mediation proceedings, as well as provide the parties with the right place to conduct mediation (Jurgilewicz, Dana 2015).

The European Code of Conduct for Mediators is similar in nature, which results in the distinction of the requirement of impartiality, consisting in the lack of bias and equal treatment of mediation participants and avoiding any activities that may appear seemingly biased and affect the neutrality of one of the parties, or that exert any pressure on the parties’ acceptance of the settlement, let alone the conciliation of the specific content. Similarly, the 2003 The Code of Ethics for Mediators provides another example of a document referring to the principle of impartiality, neutrality and professionalism of the mediator, which in fact suggests the constant acquisition of knowledge and skills by such a person, and it especially prohibits contact with parties geared towards their own benefit. This document also defines the principle of acceptability both for the acceptance of a mediator by the parties, as well as for conducting mediation based on mutual respect and in respect of the dignity of the parties and the mediator.

From a practical point of view, the most important principles expected of the mediator are, primarily, the preser-
vation of neutrality and impartiality. The principle of impartiality contained in art. 183 of the CCP imposes on
the mediator the same obligation when conducting mediation proceedings, whereas the principle of neutrality
should be associated with the obligation of lack of bias and interest in the resolution of the case, as well as an
independence of the mediator during the mediation process. It seems, however, that in the case of inequalities
between parties to the dispute arising for various reasons, the mediator may take measures aimed at leveling
the parties’ chances by allowing the weaker party to become aware of stronger aspects of his or her position. In
turn, the problem of, for example, the mediator providing legal information or issuing a legal opinion regarding
the occurrence of possible consequences in the case covered by mediation proceedings may be questionable.
The problem is important in so far as, with the relatively loose requirements of the mediator in civil matters,
that person is not required to have legal knowledge. However, this may prompt this person to offer erroneous
legal suggestions, which is all the more realistic in the light of art. 183 3a of the CCP.

As far as methods of mediation are concerned, the legislator indicates that the mediator has the right to mediate
by using various instruments (methods, styles) during the mediation process, with a view to amicably resolv-
ing the dispute, including by supporting parties in formulating settlement proposals and the right to point out
possible dispute resolutions, which are nevertheless not binding for the parties. The relatively new art. 183 3a of
the CPP enables mediation to be conducted using various techniques, and the proposals presented by the media-
tor are not binding for the parties, so the decision as to how to resolve a given dispute and conclude a specific
content remains only in the will of the parties. Furthermore, as clearly stems from the justification to the draft
law amending the Act - the Code of Civil Procedure and certain other acts in connection with the promotion of
amicable dispute resolution methods, the proposed change would primarily aim to increase the effectiveness of
mediation procedures and the number of settlements concluded in their course, especially in disputes in which
the parties appear without a professional representative. This change, thus, strengthens the role of the mediator,
who can explain to the parties their legal situation, present alternative solutions or propose submitting different
variations of resolution. The legislator allows such a possibility within the framework of an open mediation
formula, which is nevertheless initiated at the mutual request of the parties and with the approval of the me-
diator, as well as when the parties cannot independently work out the terms of the settlement. Additionally, in
the justification for the above-mentioned project, the Act also indicates that the mediator has no right to order
the parties to terminate the dispute in any particular way, nor can he or she exert any pressure on the parties,
whereas the parties themselves have the right to receive the fullest possible information in order to allow them
to make a fully aware and satisfactory decision. The mediator is also not legally required to conduct media-
tion using the method specified in art. 183 3a of the CCP. Therefore, the amendment of the CCP with regard to
methods of mediation in civil cases in practice allows the use of two styles, as defined in the scholarly literature.
Mediation can be either conventional (facilitative), in which the mediator offers assistance to the parties in re-
solving their dispute and reaching a settlement although the parties themselves suggest ways of its resolution,
or evaluative, in which the mediator assessing the legal situation of the parties and predicting court resolution
in the case suggests ways to resolve the conflict (Ryskin 1996).

Although mediation in civil matters remains a voluntary process, and the proposals submitted to the parties by
the mediator are in no way binding on the parties, nonetheless change in the CCP makes mediation more practi-
cal. With that being said, the profile of the mediator is the factor that will ultimately determine the success or
failure of this solution. In practice, parties often expect to receive a concrete proposal of resolving their dispute,
so that not only the personal traits of the mediator, but also his or her professional knowledge, will be decisive.
According to the authors of this paper, the change in question, on the one hand, allows to increase the popular-
ity of mediation, further propelled by the introduction of art. 183 3a, and on the other hand, triggers the need to
start a discussion on the proposal of establishing an institution such as a corporation of mediators so that their
activities can become more professional.

On the other hand, when referring to the costs of mediation, which includes the mediator’s remuneration, as
well as expenses incurred by him, in accordance with generally applicable law in matters of property rights, the
mediator’s remuneration is 1% of the value of the subject of the dispute, but not less than PLN 150. and no more
than 2000 PLN. for all mediation proceedings. In matters of property rights, in which the value of the subject
of the dispute cannot be determined, as well as in cases of non-property rights, the mediator’s remuneration for conducting mediation proceedings is PLN 150 for the first meeting, and PLN 100 for each subsequent meeting, not more than 450 in total. zł. The refund shall cover documented and necessary expenses of the mediator incurred in connection with the mediation to cover the costs of: journeys - in the amount and under the conditions set out in the provisions on the amount and conditions for determining the amounts due to an employee employed in a state or local government unit of the budgetary sphere for business trips; renting a room necessary to conduct a mediation meeting, not exceeding PLN 70. for one meeting, as well as correspondence, in the amount not exceeding PLN 30. In the event of the parties not joining mediation, the mediator is entitled to a refund of expenses not exceeding PLN 70.

On the other hand, the remuneration of the mediator, being a taxpayer obliged to settle the value added tax, as specified above, and the mediator’s expenses, is increased by the applicable rate of value added tax provided for this type of activity in the provisions on value added tax. Mediation, therefore, is an example of an alternative dispute resolution method, thanks to which the costs of proceedings are lower for the parties than during a normal trial, and there are no costs of attorneys. In addition, due to the use of mediation, litigation becomes cheaper, because it allows the parties to save their time compared to the classic court procedure, which optimizes not only the procedural costs, but also the entire course of proceedings in a given case.

5. Conclusions

In summary, it can be said that mediation in civil cases can be carried out using various methods (styles), as dictated by the content of art. art. 1833 of the CCP. Such a solution implies the possibility of managing legal security in the discussed area, which is practiced by a mediator. The success of the mediation process is determined not only by the will of the parties expressed both with regard to consent to mediation and to active participation in it, but also the way in which the mediator conducts the proceedings. The instruments currently available to the mediator in civil matters in practice - aside from their real impact on increasing the number of mediation proceedings and settlements concluded before the mediator - may in the long run contribute to the idea of organizing the mediators in an independent self-governing body, as long as a uniform, professional training system for candidates and mediators who wish to raise their qualifications can be developed. Apart from that, there must also exist a clear social need to use the services of such legal intermediaries. An important issue in this aspect is also the development of an appropriate formula of cooperation between judges and mediators, so that the content of the settlement prepared by them is correct in substance, and especially, is in accordance with the universally binding law and principles of social coexistence, since these are the only settlements that can be approved by the judges, which in practice would largely optimize the costs of the entire proceeding, which in fact mediation is intended to serve.

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Act of 10 September 2015 amending certain acts in connection with the promotion of amicable dispute resolution methods (Journal of Laws of 2015, item 1595).

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COUNTER-TERRORISM IN THE UNITED KINGDOM: SUSTAINABLE MEASURE OR VIOLATION OF HUMAN RIGHTS

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Abstract. Terrorism has been one of the most prominent issues in the last three decades. Since 2001 and the attacks on September 11, terrorism has gained a global impact. Terrorism today threatens the safety of individuals more than ever. In order to combat terrorism, countries around the world have adopted various counter-terrorism strategies. The United Kingdom is one such country. Through the analysis of the United Kingdom’s counter-terrorism strategy, its laws and decisions from both domestic and international courts, the authors of this article aim to determine whether counter-terrorism is a sustainable measure or a violation of human rights in the United Kingdom.

Keywords: The United Kingdom; terrorism; counter-terrorism; human rights; violation; sustainable measure


JEL Classifications: K10, K22, K37

Additional disciplines: law; political sciences; sociology

1. Introduction

The emergence of new, especially asymmetric security threats and their proliferation following the fundamental changes in the worldwide security environment at the end of the second and the beginning of the third millennium significantly shaped the view on ensuring security (Ivančík, Nečas, 2017; Kordík, Kurilovská, 2017; Šišulák, 2017; Prause et al., 2019). As terrorism is one of the greatest asymmetric threats in the 21st century, most countries across the world adopt or have already adopted some form of counter-terrorism measures. The aim of counter-terrorism is to ensure the safety of individuals, in that regard. However, the question remains at what cost do they enforce those measures. Terrorism is defined by fear. As Walter Laqueur remarks, terrorism is the „use of violence and/or the threat of violence“ (Laqueur, 1999., 6). Ivančík adds that terrorism is a politically motivated act of violence by certain groups or individuals in order to spread fear. Fear spreads when people perceive that their safety is threatened. Therefore it is the duty of the governments to provide security to its citizens. Siniša Tatolović states that the survival of the country and its society is the primary goal of every policy of every government (Tatalović, 2006.) Security, as Tvaronavičienė remarks, “is a form of protection for structures and processes that provide or improve security as a condition” (Lankauskienė and Tvaronavičienė, 2012., 288.). However, under the disguise of security, governments can also impose laws and restrictions that
threaten the liberty of its citizens which can be an even greater threat. In those cases, structures and processes, which are controlled by the government, endanger the safety of certain groups or individuals within a society. According to Laqueur, state terrorism is far more dangerous than non-state terrorism, since “terrorist acts that have been committed by police states and tyrannical government have generally, had a thousand times more victims and have caused a thousand times more misery than any acts of individual terrorism together“ (Laqueur, 1987., 146). After the September 11 attacks, counter-terrorism policies have been the subject of many debates around the scientific community, simply because of their potential infringement on basic human rights, which are guaranteed by international laws established by the United Nations.

This paper focuses on the scientific question if counter-terrorism of the United Kingdom (UK), in its current form, is a sustainable measure in a modern democratic society which ensures human rights and the rule of law? By examining documents, legislation, scientific studies, policies, and political remarks, the authors will argue that United Kingdom’s fight against terrorism has left consequences on pillars of democracy, such as preservation of human rights, transparency of government policies and fairness towards all people in the UK. In the first part of the paper, the theories of terrorism and democracy will be examined for the purpose of showing how counter-terrorism can impact democratic principles and affect the liberties of individuals and groups. The second part will focus on the UK’s laws and policies to combat terrorism and the increasing power of government at the expense of democratic freedoms. With this paper, the authors will try to prove that counter-terrorism can leave undesired consequences on democratic societies on the example of the United Kingdom. If terrorism is an act that inspires fear, then governments must be careful in their dealings with it, so they don’t resort to nondemocratic measures and threaten the same liberties that the terrorists aim to.

2. (Counter)Terrorism – a threat to human rights in the context of human security

Terrorism has many definitions. Schmid and Jongman’s (2005.), research has shown that there are 109 definitions of terrorism in the scientific literature. Wilkinson (1974.) provides one definition of terrorism and claims that terrorism can be described as the use of violence or the threat of violence in favor of achieving political change. Bilandžić (2010.) also adds that terrorism, as a political concept, can serve to understand terrorist goals, motive, and intentions, because today, terrorism is one of the most dangerous political and security issue of the modern world. The phenomena of terrorism is not a new concept, since some forms of terrorism have been present almost throughout the whole history. As remarked by Bilandžić (2010.,59-60) the roots of terrorism can be traced back to the first century. There were a number of groups which committed terrorist attacks, such as the radical Jewish patriots who were known as „zealots“, or the „assassins“, an extremist group which advocated for a version of pure Islam. Today, terrorism is linked to violent acts mainly committed by extreme religious groups. However, in the political discourse, terrorism was first used to describe state terrorism which manifested itself as The Jacobin dictatorship during the Reign of Terror in France in the very late 18th century (Primorac 2002. 60., Marić, 2012.). In the middle of the 19th century, terrorism has gained a non-state or „anti-state“ characteristic which mainly remained in the political discourse until today. One of the key differences in today’s non-state and state terrorism can be pointed out in their objectives. Non-state terrorism targets the government of a country or a society for the purpose to turn their own citizens against them and weaken democracy. State terrorism tries to establish control over their own citizens with the intention of remaining in power. Primorac remarks that unlike non-state terrorism which thrives on media coverage, state terrorism functions under the guise of secrecy (cited in Roško, 2018).

In an attempt to precisely define who or which group has terroristic remarks the General Assembly of United Nations (UN) had numerous tries in the 1990s with the purpose of reaching a consensus among the member states. In Resolution 49/60 known as Declaration on Measures to Eliminate International Terrorism (1994) and in the International Convention for Suppression of the Financing of Terrorism (1999), the United Nations wanted to clearly state which acts are considered as terrorism and how to successfully deal with the threat of modern terrorism. In the last 30 years more than dozens of documents from the UN have sought to combat terrorism.
However, at that time, the member states had more pressing concerns. On September 11 of 2001, following the attacks on the United States of America, terrorism became the primary concern of the member states. The United Nations Security Council did not wait long. On September 28, the Security Council adopted unanimously Resolution 1373, a counter-terrorism measure in order to effectively combat terrorism. Resolution 1373 obliged every member state to align their national laws and rectify numerous international documents against terrorism. Counter-terrorism Committee was formed as a supervisory body with the aim of ensuring that states fulfill their obligations under the Resolution (Security Council Resolution 1373, 2004.). After several years and numerous terrorist attacks, the Security Council remarked that terrorism has to be redefined again to include kidnappings and similar manifestations of terrorism. In the new Resolution 1566 (2004.), terrorism now included taking hostages and broadened which groups were blacklisted as terrorist groups (Security Council Resolution 1566, 2004.). One year later, right after the London bombings and under the strong support of Blair’s government, the Security Council adopted Resolution 1624, which condemned the encouragement to commit terrorist acts and glorification of terrorist acts (Security Council Resolution 1624, 2005.). In 2006., The United Nations General Assembly on a strategy to enhance counter-terrorism measures. The UN Global Counter-Terrorism Strategy allowed states to define or redefine their counter-terrorism measures in order to combat new threats. The term „counter-terrorism“ has many meanings as it describes various areas of activity. Simply put counter-terrorism, or anti-terrorism, includes governmental (and international) policies and strategies, law enforcement, and in some cases military in an effort to effectively combat terrorism. Aside from the UN, many regional international organizations also sought to fight terrorism. For example, The Council of Europe supported the UN actions against terrorism, in adopting Guidelines of the Committee of Ministers of the Council of Europe on Human Rights and the Fight Against Terrorism in 2002. These guidelines allowed certain derogations from human rights. In 2005., after Resolution 1624 came into effect, Council of Europe yet again agreed with the UN and brought forth Convention on the Prevention of Terrorism that criminalized public provocation to commit „terrorist offenses“. (Convention on the Prevention of Terrorism, 2005).

Each and every one of these documents and treaties sought to protect human beings from the dangers of terrorism.

As national security was the concern of the 20. century (Lippman, W., 1943., Tatalović, 2006.), now human security was the problem of the 21. century. Human security is a relatively new concept that was first introduced on the global scale in the United Nations Development Programme’s Human Development Report of 1994. Malik (2015.) states that because of the impact of globalization and the liberalization of the global economy, new insecurities are emerging around the world. As a consequence of various processes, human security extended itself into areas such as human rights, development, poverty alleviation and the combating of disease (Malik, 2015., 60). The above-mentioned threats to human life had been categorized into two components of human security: „freedom from fear“ and „freedom from want“. The concepts of „freedom from fear“, stands for protecting the people from violent threats and conflicts such as poverty or war. While, the concept of „freedom from want“ emphasizes protecting the people from sudden and global threats, i.e. natural disasters, diseases, hunger. The approach of „Freedom from fear“scholars mainly fights for sustainable development and achieving lasting security policies (Human Development Report, 1994.). Malik (2015., 62) concludes that the UN’s vision of Human Security goes well beyond the threats of militarism and embraces human tight and the development of societies. Human rights are, therefore, necessary for the purpose of sustaining the safety of individuals.

The basis of human rights can be traced back to Magna Carta Libertatum (1215) and the Habeus Corpus Act (1679). Magna Carta Libertatum was one of the first documents to limit the absolute power of a king and give some form of protection to the king’s subjects. Rights granted by the Magna Carta can still be found in English law and its unwritten constitution. Habeus Corpus Act builds upon the rights granted by Magna Carta, and also included the right to extended legal protection, thus preventing unlawful arrests, arrests without a court order and harassment during an investigaion. Habeas Corpus Act is also included in the English law. In the modern world, the need for defining and protecting human rights has been sought after the horrors of World War II. Following the United Nations Charter (1945), the United Nations General Assembly adopted the Universal Declaration of Human Rights on 10 December 1948. Universal Declaration of Human Rights has 30 articles that
protect human rights. From the right to liberty, life, therefore, the prohibition of slavery, to the right of freedom of thought, and the social or cultural rights. The Council of Europe took a step further in protecting human rights and implemented the European Convention on Human Rights (1950) that allowed citizens to present their problems within to the European Court of Human Rights, after exausting all legal means in their own countries. During the Cold War era, the United Nations sought to define and protect different segments of human rights. It is with that effort that civil and political right were protected under International Covenant on Civil and Political Rights (1966), and the economic, social and cultural rights were protected under International Covenant on Economic, Social and Cultural Rights (1966). After the rise of the Amnesty International Reports about torture from the governments around the world (Lippman, M., 1994.), the United Nations General Assembly adopted The Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment (1984.) as a measure to effectively prevent torture in the future. According to Landman (2013.), under the international laws, governments today, must not only protect human rights but also need to prevent the violation of human rights from any individuals or groups in their respected societies.

3. Sustainability of the United Kingdom’s counter-terrorism measures in regard to human rights

The UK has had a long history of terrorist attacks on its territory, from religious extremists in the so-called Gunpowder plot conspiracy in 1605. to all branches of the Irish Republican Army (IRA) in the 20th century. Until the September 11 attacks, the UK’s counter-terrorism policy was focused on combating domestic terrorist groups, such as IRA. As mentioned above, one of the branches of the IRA, called Provisional Irish Republican Army or PIRA (Wilkinson, 1986.) conducted a series of multiple terrorist attacks from 1968 until 1998. This time period was called the Northern Ireland conflict or „The Troubles“ and represented over 30 years of conflict between PIRA and the British government. During this period the British government implemented numerous laws and measures, through so-called Emergency Powers, for the purpose of dealing with PIRA. Kent Roach (2011.) states that these emergency measures and laws lead to formal derogations from the Habeus Corpus Act and the European Convention on Human Rights (ECHR) in Northern Ireland and England. In this fashion, the UK suspended some of the fundamental human rights of those who were suspected of committing terrorist acts. According to Dyer and Bowcott, suspects (of terrorist acts) had to present their cases to the European Court of Human Rights with the intention that the British government infringed on their rights (cited in Roško, 2018.). After the end of the conflict with PIRA and the Good Friday Agreement (Wilford, 2001), the UK wanted to expand upon the rights of individuals and redefine terrorism to accommodate to terrorism’s global impact. With the Human Rights Act 1998 (HRA) the UK gave „domestic effect“ to the rights guaranteed under the ECHR (Fenwick and Phillippson, 2012., 484). Courts in the UK could now also express their concern if a piece of legislation isn’t in full compatibility with the rights under ECHR. Although the courts could not stop the government from implementing such legislation, they could, however, advise the government not to do it (Demirsu, 2017.). Now that certain human rights have been established more firmly, the UK Parliament passed a new law against terrorism, named the Terrorism Act 2000. The goal of Terrorism Act 2000 was „to replace all existing counter-terror legislation that had been passed as a result of the conflict in Northern Ireland with a coherent law which covered the whole UK“ (Moran, 2013., 67). Terrorism Act 2000 defines terrorism as a threat of action where it:
   a) involves serious violence against a person,
   b) involves serious damage to property,
   c) endangers a person’s life, other than that of the person committing the action,
   d) creates a serious risk to the health or safety of the public or a section of the public, or
   e) is designed seriously to interfere with or seriously to disrupt an electronic system (Terrorism Act 2000)

Additionally, terrorism is also interpreted as „the use or threat to influence the government or to intimidate the public or a section of the public, and the use or threat is made for the purpose of advancing a political, religious or ideological cause“ (Terrorism Act 2000). Ian Cram asserts that the new Act and its ideological aspect/ clause easily allow the government to target companies who do research on live animals, while abortion clinics can now be threatened with charges for committing terrorism (Cram, 2006., 339). Roach perceives that the most dangerous part of the Terrorism Act 2000 was section 44, where polices forces were granted the power to stop and search and individual with no probable cause required (Roach, 2011.). Furthermore, Ipek Demirsu
warns that the most alarming consequence of Terrorism Act 2000 is „the securitization of dissent or protest, as these areas of political life are deemed possible sites that might harbor elements of threat to national security“ (Dermisu, 2017., 76). The right of freedom of speech, hence the right to protest, is a crucial part of the political engagement that has now been marginalized by the Terrorism Act 2000, turning protest into potential criminal acts. Clive Walker adds that the right to protest is a vital part of democracies and that „given the dependence of democracies upon the mobilization of the masses, both at political and practical levels, care must be taken to avoid alienating the public by counter-terrorism measures that appear disproportionate of senseless“ (Walker, 1151., 2006.).

Consequently, Terrorism Act 2000 and its broad definition of terrorism has steered the UK one step closer to nondemocratic practices of dealing with protest and freedom of speech. The continuation of such practices continued into the future. Confirmation of the impact that Terrorism Act 2000 had on private life of individuals came in 2010 when the European Court on Human Rights, in the resulting decision in case of Gillan and Quinton v United Kingdom, found that sections 44 – 47 were in „clear interference with the right to respect for private life“ (quoted in Fenwick and Phillipson, 2012., 502.). In February 2019, the European Court of Human Rights ruled in another case that that Terrorism Act 2000 intrudes upon the privacy of citizens. In Beghal v. the United Kingdom, ruled that certain powers of authorities granted by the Terrorism Act 2000 violate Article 8 (right to privacy and family life) of the ECHR.

Aside from the Terrorism Act 2000, the British government also passed Regulation of Investigatory Powers Act (RIPA), thus allowing the police and security agencies the ability to collect an extensive amount of e-mails, phone calls and internet searches from UK citizens. Jon Moran warns that the authorization to collect such data can be authorized from any senior police officer or any public officer, thus the protection of privacy is merely left upon the wishes of an officer without any oversight (cited in Roško, 2018.). United Kingdom’s second major legislation regarding global terrorism came after the September 11 attacks, when prime minister Tony Blair took further steps to ensure that the UK had the right safeguards against terrorist acts. With the new Anti-terrorism, Crime and Security Act 2001 (ATCSA) the British government built upon Terrorism Act 2000 and expanded the list of criminal offenses that can be tied to terrorism. ACTSA followed the Security Council’s Resolution 1373 and together with targeting terrorism financing, allowed the Treasury to seize foreign assets, granted police and intelligence agencies access to secret tax information, provided the power to retain (communication) data, criminalized withholding information and expanded police powers in investigations (Roach, 2011.) ACTSA also allowed the expansion of the video surveillance system throughout the UK with CCTV-a cameras. Thus, the right to privacy and family life under Article 8 of ECHR was impossible to protect, since aside from the government, any individual could install CCTV cameras on their property. By 2013, the number of CCTV-a cameras was 5,9 million or one camera on ever 11 citizens of the UK. (cited in Roško, 2018.). Among the multitude of new measures of ACTSA, the most controversial one was the new power of the Home Secretary, who could now order indeterminate detention of noncitizens suspected in terrorism, specifically noncitizens who couldn’t be deported because of the threat of torture or death (Roach, 2011.). Those individuals who are suspect of terrorism, and are detained indefinitely, could appeal their case to the special court named Special Immigration Appeals Commission (SIAC). Wagstaff (2014.) adds that detainees did get special lawyers assigned to their cases, but they couldn’t be of much help since they weren’t given permission to see the materials against their clients. In 2004, the House of Lords held that the indefinite imprisonment without charge or deportation of noncitizens was in breach of the Human Rights Act 1998, thus prompting the Government to change and repeal Part 4 of ACTSA. (Dyer, White and Travis, 2004.) Aside from breaching the Human Rights Act, ACTSA also breached Article 5 of ECHR (the right to liberty and security) since the government did not provide sufficient evidence for detaining persons indefinitely. This was best presented in the case of several detainees who were held in the infamous Belmarsh prison in London (Roach, 2011.). The Government defended its actions regarding these measures as protecting the lives of UK citizens, which are guaranteed under Article 2 of ECHR, as well as the British law. Nonetheless, the failure of balancing security and human rights weighed heavily on Blair’s government. Prime Minister Blair didn’t want a constitutional crisis and proposed The Prevention of Terrorism Act 2005, which would correct questionable measures of ACTSA and would legitimately derogate from the rights guaranteed by the ECHR (Roško, 2018.) The UK parliament passed The Prevention of Terrorism Act 2005 on the 11th of March, 2005.
On the 7th of July 2005, London experienced its first Islamic terrorist attack. In a series of attacks, suicide terrorists activated explosive in the London Underground, killing 38, and wounding 700 people (Muir and Cowan, 2005.) As mentioned previously, the Security Council passed Resolution 1624 which criminalized propaganda and glorifying acts of terrorism. Simultaneously, the UK Parliament passed the Terrorism Act 2006. Terrorism Act 2006 criminalized acts that „glorifies, exalts or celebrates the commission... of acts of terrorism“, as well as any form of „encouragement of terrorism and the dissemination of terrorist publication“ (Terrorism Act 2006.). This was not the first time the UK decided to limit freedom of speech, as Demirsu mentions, „the British government has a tendency toward limiting freedom of expression and association in relation to terrorism, as in the case of broadcast bans against the IRA. (Demirsu, 82., 2017.). A few months after Terrorism Act 2006 came into effect, the Government presented the public its counter-terrorism strategy known as CONTEST. Although CONTEST was first developed in 2003, it has only been presented to the general public after the attacks on 7th of July. CONTEST was divided into four principal strands:

- PREVENT - prevent terrorism by dealing with the radicalization of individuals
- PURSUE - pursue terrorist and those who finance and/or sponsor them
- PROTECT - protect the public, key national services and the interests of the UK overseas
- PREPARE - prepare for the consequences of terrorist attacks (Countering International Terrorism: The United Kingdom’s Strategy, 2006)

With both CONTEST and Terrorism Act 2006, the UK set harsher regulation on freedom of speech and expression. Terrorism Act 2006 left the possibility for the British government to, under the disguise of new counter-terrorism measures, ban or censure media outlets and journalists who criticized Blair’s new law. Aside from the journalists, the academic society had to be careful as well. A student of Nottingham University by the name of Ritwaan Sabir was researching al-Qaida tactics he downloaded from the US government website and was held for six days in custody (Curtis and Hodgson, 2008.). Aside from securitizing and limiting the flow of information, Terrorism Act 2006 also extended police powers to hold terrorist suspects to 28 days without charge, amened and increased the powers under RIPA and granted the Home Secretay power to ban groups that glorify terrorism. (Terrorism Act 2006.). Terrorism Act 2006, was a direct response to the attacks on July 2005, as such, it is an Act that was rushed through the Parliament and cared little for protecting human rights, in this instance, the right of freedom of speech. In 2008, even the United Nations Human Rights Committee expressed their concern about the provision that criminalized glorification of terrorism, stating that the goal of some statements may not be to encourage terrorist acts , but „can be understood by some members of the public as an encouragement to commit such acts“ (cited in Demirsu, 85., 2017.). The statement of the United Nations Human Rights Committee shows that the measures implemented in Terrorism Act 2006 were not sustainable in regard to further combat terrorism since it infringed upon one of the cornerstones of democracy. With yet another defeat in counter-terrorism laws and continuous low approval ratings, Tony Blair resigned in 2007 as Prime Minister of UK and was replaced by Gordon Brown. Brown’ government did not wait long to try and reform laws concerning measurers against terrorism. In the new Counter-terrorism Act 2008 some of the most important changes were the proposals to:

a) increase the pre-charge detention (of terrorist suspects) to 42 days in special circumstances
b) enable constables (police officers) to take fingerprints and DNA samples from individuals who are subject to control orders for the purpose of using them in terrorism investigations.
c) enables post-charge questioning of terrorist suspects and the drawing of adverse inferences from a refusal to silence
d) extend sentences for offenders convicted of offenses with a terrorist connection.
e) criminalize the offense of eliciting or attempting to elicit information about a member of Her Majesty’s forces, intelligence service or a constable (police officers) which is likely to be useful to a person committing or preparing an act of terrorism
f) enable inquiries to be heard without a jury (Counter-terrorism Act 2008)

The section of Counter-terrorism Act 2008 that increased the pre-charge detention was later modified into a temporary provision, so the Parliament can decide if it was necessary or not. This was a welcome change from the „pre-charge detention“ provisions that were in effect in the past.
While the British government has decreased certain measures it has also toughened others. For instance, section 76 of the new Act, which covered criminalize the offense of eliciting or attempting to elicit information from military, intelligence and police officers has, similar as Terrorism Act 2006, caused a lot of concern with the journalists and photographers. They were afraid that the new terror law would target them, since seeking information, thus facts, and asking questions was in their job description. The National Union of Journalists and the British Press Photographer’s Association warned that „law would extend powers that are already being used to harass photographers and would threaten press freedom.“ (Adetunji, 2009.). The freedom of the press has become one of the key pillars that shows how much liberty and freedom can citizens enjoy in a country (Rýsová, 2015). By indirectly attacking the media and securitizing the issue of informing the public, the British government stepped on to try and minimalize the damage its counter-terrorism laws have been having on protecting human and civil rights. Furthermore the right to remain silent in questioning, as well as freedom from „oppressive questioning“ was entranced because of the provision that could enable post-charge questions if a suspect failed to mention some information that can be later used in court. Even the right to legal defense has been touched upon by the new law. Demirsu asserts that „these measures have undermined the principle of due process, as the sovereign invokes a sense of imminent threat to national security and exempts itself from scrutiny or accountability“ (Demirsu 88., 2017.). If security is at all times „under imminent threat“, then the reasoning of the British government that it’s protecting the right to life while infringing other rights, is a rational explanation. Nevertheless, if a country is constantly under danger and is limiting the freedom of its citizens, it is no longer a society governed by democratic principles. Walker questions the timing of the British governments with its impactful measures since the government uses Article 2 of ECHR only when „it feels it convenient to do so.“ (Walker, 71., 2013.). The rationalization of the government that it is only doing what must be done to preserve the lives of its citizens has become the norm when asked if it’s laws impact human rights. Demirsu puts it simply, and warns: „...the provisions it (Counter-terrorism 2008) has introduced are a normalization of exceptional measures, fortified by the idea that security is constantly under threat. (Demirsu, 88., 2017.). Counter-terrorism Act 2008 didn’t accomplish anything relevant to restore some protection of human rights. On the contrary, it strengthened previous measures to limit freedom of speech and expression.

After the general elections in 2010, Leader of the Conservative party, David Cameron formed the Coalition government with Nick Clegg, the leader of the Liberal Democrats. Under the new Coalition government, the balance between security and democratic rights was sought after. One could argue that the new government, led by Cameron, wanted to distance themselves from the previous government and its laws, led by the Labour party. However, the sudden eagerness to restore some rights can also be described as a direct consequence of various court rulings, among others, the case of Gillan and Quinton v United Kingdom adjudicated by the European Court of Human Rights. Terrorism and Investigations Measures Act 2011 tried to reestablish the legal balance between security and freedom, whilst creating a new strategy to protect the public from the threat of terrorism. The Act established Terrorism Prevention and Investigation Measures, or TPIMs, new measures that replaced the controversial control orders. TPIMs could only be applied to a suspect on the period of 2 years, except if the suspect is deemed a threat to national security, then they coulb be prolonged. TPIMs needed to combat terrorism while preserving the rights guaranteed under ECHR. Fenwick and Phillipson (510., 2012.) argued that TIPMs were a „light touch“ version of control orders. Demirsu (2017.) critiqued calling them nothing more than rebranded measures that did not solve the fundamental problem of counter-terrorism legislation, the fact that suspects are treated outside regular criminal laws and can’t enjoy their basic rights.

A year later, the Protection of Freedoms Act 2012 aimed to restore some of the rights that have been under attack in the past decade. The Protection of Freedom Act 2012 regulated the retention of biometric data such as fingerprints and DNA (DNA profiles had to be destroyed if the arrest was deemed unlawful), it also regulated the usage of surveillance and instructed the Secretary of State to bring forth a code of practice for CCTV and similar programs ( Protection of Freedoms Act 2012). Protection of Freedoms Act 2012 restored some rights to privacy (Article 8 of ECHR) with the biometric data and surveillance limitation, along with certain leniency with potential suspects of terrorism. Most notably, Protection of Freedoms Act 2012 abolished sections 44-47 of the Terrorism Act 2000, the „power to stop and search“ provisions. The Act also amended RIPA to be more respectful of human rights and now required major offenses to be implemented, as for the lower offenses, it was
terminated. Furthermore, the Act also decreased the pre-charge detention (of terrorist suspects) from 28 days to 14 days (Protection of Freedoms Act 2012). Protection of Freedoms Act 2012 thus restored some enjoyment of human rights, whilst „reducing the power of the government to intervene in individuals’ private lives, as well as bringing new limits to counter-terrorism strategies.“ (Demirsu, 91., 2017.). Protection of Freedoms Act 2012 was a first step towards a sustainable counter-terrorism policy in over a decade.

In midst of the growing threat from the war in Syria and the Islamic State of Iraq and the Levant (ISIL), the British government wanted to effectively prevent terroristic threats from reaching its borders, in conjunction with stopping potential radicalization of its citizens. In that regard, State Secretary proposed Counter-terrorism and Security Act 2015 („CTSA“) Counter-terrorism and Security Act 2015:

- seizure of UK citizens’ passports at airports and border crossings;
- cancellation of the passport of UK citizens;
- preventing UK citizens from re-entering their country;
- prohibiting the entry of individuals into the UK for two years;
- further preventing the spread of the ideology of terrorist organizations, identifying “vulnerable persons” so that they are not involved in terrorist activities;
- enhanced preventive action; enhanced surveillance of communication devices (Counter-terrorism and Security Act 2015)

CTSA also contained a provision regarding the PREVENT method from the Government’s CONTEST. Section 26 of the CTSA, called the Prevent Duty, required childcare providers, schools, universities and other higher education bodies to „have due regard to the need to prevent terrorism“ (Counter-terrorism and Security Act 2015). The Prevent Duty resulted in several controversial cases, from questioning of a 14-year-old student for using the word „eco-terrorist“ when speaking about the environment (Dodd, 2015), to a postgraduate student of counter-terrorism being accused of terrorism simply for reading a book in his field of study (Ramesh and Halliday, 2015). In both cases the students were Muslims. Louise Richardson, vice-chancellor of Oxford University stated that the Prevent strategy was stopping university students from voicing their views on certain topics (Merrick, 2015.). The academic community expressed their concern, as 360 professors from various universities signed the statement saying the PREVENT strategy conceptualizes that the term radicalization, therefore extremism is „based on the unsubstantiated view that religious ideology is the primary driving factor for terrorism. Academic research suggests that social, economic and political factors, as well as social exclusion, play a more central role in driving political violence than ideology. Indeed, ideology only becomes appealing when social, economic and political grievances give it legitimacy. Therefore, addressing these issues would lessen the appeal of ideology.“ (Protecting Thought, 2015). PREVENT was another attempt of the Government to target freedom speech and expression, only this time at educational institutions. Hence, the right to freedom of thought (Article 9 of ECHR), the right to present ideas and ideological claims now falls within CTSA. The ability to study different ideologies and their impact on societies is one of the aspects of a democratic country. If the objective of the Government is to defeat terrorism and its ideology, then limiting the discourse about such ideology will have a counter-effect on the ongoing struggle against terrorism. In March 2019, the Court of Appeals found that certain guidelines under PREVENT were unlawful since they were not clear in informing the universities „of their competing obligations to ensure free speech while stopping people being drawn into terrorism.“ (Gayle, 2019).

Two years after CTSA came into effect, the UK suffered its worst terrorist attacks since the London Underground attacks in 2005. On 22nd of May in 2017, a suicide bomber activated a homemade shrapnel bomb at Manchester Arena while people were leaving from a concert. More than 130 people were injured, while 23 died. This was the second attack in two months after a vehicle drove into pedestrians on Westminster Bridge in March. Following the Manchester Arena bombing, two attacks occurred in June when a van drove into pedestrians on London Bridge and another van drove into pedestrians outside a mosque in Finsbury Park. The last major attack in 2017 came in September when a bomb detonated at London’s Parsons Green tube station. Following CTSA, the British government planned to release an updated version of CONTEST, the UK’s counter-terrorism strategy in April of 2017. However, due to the terrorist attacks and the political crisis caused by the results of the United Kingdom European Union membership referendum (commonly known as the Brexit
referendum), which resulted in Theresa May being named Prime minister, the British government postponed the release of updated CONTEST. After the Manchester attacks May declared that she would fight terrorism with greater effort, announced a review of the government’s approach to counter-terrorism and said that „if human rights laws stop us from doing it, we will change those laws so we can do it“ (Mason and Dodd, 2017.).

In 2018., CONTEST (Countering International Terrorism: The United Kingdom’s Strategy, 2018) was updated to reflect the new determination of the British government. UK’s Home Secretary Sajid Javid proposed new legislation concerning counter-terrorism called Counter-Terrorism and Border Security Bill 2018. The proposed legislation was criticized by numerous organizations and subjects, including Fionnuala Ní Aoláin, United Nations (UN) Special Rapporteur on the promotion and protection of human rights and fundamental freedoms while countering terrorism, professor Joe Cannataci, United Nations Special Rapporteur on the right to privacy and Harlem Désir the Organization for Security and Co-operation in Europe’s (OSCE) Representative on Freedom of the Media. Counter-Terrorism and Border Security Bill 2018 was eventually partly amended, but certain provisions regarding the freedom of expression were still a part of the legislation. The British parliament passed the Bill and it received Royal Assent on 12th of February in 2019, thus becoming Counter-Terrorism and Border Security Act 2019. The Act passed with a relatively small amount of concern amongst the general public, arguably due to the decision of the British citizens to leave the EU in the Brexit referendum (Janas, Kucharčík, 2017).

Counter-terrorism and Border Security Act 2019 has several provisions that have caused concern among the public, most notably the provision that makes it a criminal offense to enter or remain in a “designated area” overseas and the provision that criminalizes the viewing of any terrorist material online. (Counter-terrorism and Border Security Act 2019). Although, the Act accounts for special circumstances of being in a „designated area“, e.i. humanitarian workers and journalists, it still allows the Government to pressure journalists into giving up materials and sources. The provision concerning the viewing of „any terrorist material“ also made an exclusion to protect journalists and academic from prosecution. Nevertheless, the Joint Committee on Human Rights stated that the provision „is a breach of the right to receive information and risks criminalizing legitimate research and curiosity“ (cited in Dearden, 2019.). Counter-terrorism and Border Security Act 2019 is still arguably a new piece of legislation on the ever-existing problem of terrorism, and its true impact on civil society and human rights is yet to be seen.

Conclusions

In this paper, the authors dealt with the issues of counter-terrorism legislation as a sustainable measure in regard to the protection of human rights. To that regard, the authors have established that the UK’s counter-terrorism policy in the 21. century has, thus far, been intruding on some of the basic human rights, such as the right to privacy and freedom of speech and expression. Most notably, the Terrorism Act 2000 securitized the right to freedom of speech and the right to privacy. ACTSA allowed surveillance of millions of citizens through the CCTV system, as well as the retention of an enormous amount of data containing private information about citizens. It was partly replaced by The Prevention of Terrorism Act 2005, which enabled derogation from certain human rights in accordance with ECHR. In continuation with the UK’s counter-terrorism policy at the time, Terrorism Act 2006 and Counter-terrorism Act 2008 restricted the ability of the media and public to acquire information about various topics, which have been deemed as security issues. In 2010s Terrorism and Investigations Measures Act 2011 and Protection of Freedom Act 2012 sought to re-acquire balance between security and freedom. However, with CTSA in 2015, and the revised CONTEST strategy, the UK turned its attention on freedom of expression and thought. The PREVENT method of CONTEST targeted educational institutions and was deemed by numerous scholars as an excessive measure.

The latest counter-terrorism law, Counter-Terrorism and Border Security Act 2019, has yet to show its impact on human rights. In less than two decades, the British government has passed 8 laws against terrorism. The true impact on human rights in those laws has been pointed out by various committees, domestic courts and the European Court of Human Rights, primarily in the cases of Gillan v Quinton v. the United Kingdom and Beghal v. the United Kingdom. The UK has to change the way it approaches preventing and countering terrorism, because its current strategy, hence legislation, is not compatible with the protection of human rights and in that
regard could not be considered as a sustainable measure for the future.

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ASSESSMENT OF BASIC ELEMENTS OF THE SECURITY SYSTEM OF LOCAL COMMUNITIES

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Abstract. The aim of the present paper is to present preliminary results of the pilot research pertaining to the assessment of the fundamental elements of the local security system, the research being conducted by the authors on the statistically significant sample (4 400 persons) of the inhabitants of local communities of the Kuyavian-Pomeranian voivodeship (an administrative unit in Poland). Since the research was very extensive indeed, the present paper contains only a fragment of its results. It transpired that the sense of security of the members of the local communities of the Kuyavian-Pomeranian voivodeship is at a relatively high level. With the assumed scale (ranging from 1 to 10), the greatest number of respondents assessed it at the level of 8 points, and the absolute majority of them assessed it at least at the level of 6. Among all the elements assessed, it was the operations of fire fighters that were evaluated as best. What was assessed as definitely the worst was the functioning of health care and of non-governmental organizations. What came as a sort of surprise are relatively poor (given the allegiance to tradition exhibited by Polish society) scores given to the influence of the Church on the sense of local communality, with a relatively frequent scores falling in 1-4 range. The research method thus put forward by the authors is innovative since it offers a combination of so-called hard elements of security elements with barely measurable sense of security, as assessed by particular persons. A relatively large research sample ensures that the results are significantly informative.

Keywords: the security of local communities, security threats, local community

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1. Introduction

Security is nowadays one of the most popular issues, considered both in the realm of politics and on the media. It is also scholars that take interest therein. This concept is multi-dimensional and can be analyzed from different angles. However, the research conducted on security takes an entirely different shape depending on whether we assume the perspective of strategic objectives of the state, a group of people or the one of an individual person. Despite the fact that, regardless of a research perspective assumed, we deal with a similar sort of threats, we, qua citizens, are not always aware of the above fact. For an average person, which is indicated by the research in question (diagnoses of social problems from the position of a given commune), what matters most are current affairs related to their daily life; that is, permanent employment, the stability of household budget, health issues, and the order in the streets for that matter (Jankowska, 2014; Bernardi, 2019). Certainly, the above statement applies only when public authorities will ensure the satisfaction of the needs of an individual and there holds law and order in the public realm. In developed societies, public law and order is usually treated as a state of normalcy. Still, if the said order is brutally disrupted; for instance, by terrorist attacks, or by
ordinary crimes, the perception of security radically changes (Tyushka, 2019). Then the said perception thereof starts leaning towards traditional areas including basic elements ensuring the survival of an individual person (Kelly, 2005; Kordík, Kurilovská, 2017).

Under Polish conditions, in which the society feels relatively safe, what plays a key role in the local environment are the above-stated so-called soft determinants of the sense of security. These comprise mainly economic factors that allow for successful functioning in a society. It seems that nowadays their role reduces to one more important issue; namely, to the fact that economic resources enable us in extreme cases; that is, when the sense of threat exceeds the critical level, to change the local environment. The processes of migration in search of finding proper home are becoming a daily routine these days. This applies to internal migration. What is also conspicuous in the case of open borders of the European Union is that the scope of these processes was considerably extended (Czarnecka, 2018; Garczewski, 2016; Wawrzusiszyn, 2017; Todorov et al., 2018; Škuflić et al., 2018; Lialina, 2019).

The purpose of the present paper is to present introductory and fragmentary results of the pilot study on the sense of security, with the study being conducted by the authors on the statistically significant sample of the inhabitants of local communities of Kuyavian-Pomeranian voivodeship. One of the areas subject to the respondents’ assessment were the elements of the system of local security, including public officers (fire fighters, policemen) and that is why the presentation of the results of the study shall be preceded with a succinct description of the system in question.

2. Theoretical background

A considerable part of local studies is related to victimization (Foster, Giles-Corti, & Knuiman, 2010; Guzik, 2000). The studies on the sense of security, in the authors’ view, is the key to implementing the changes in the policies pursued by local authorities for the sake of improving safety of local communities. However, it must be stressed that they are of subjective character and they merely amount to the implementation to the coordination of operations on the part of services and institutions. Yet, it must be said that they are particularly related to an efficient cooperation between local communities and local authorities (Delbosc & Currie, 2012; Prause et al., 2019). The research on a smaller scale, with reference to already specified threats, mainly pertaining to the public order, was conducted in various places, such as, for example, Wellington City (Coggan & Gabites, 2007), Auburn (Shepherdson, 2014). What was also studied was the relation between human capital and housing development of metropolitan suburbs – Perth (Wood et al., 2008; Omelchuk, 2018; Sasonko et al., 2019); furthermore, there was also some research on fear of criminality in urban areas and in the countryside of Turkey (Karakus, Mcgarrell, & Basibuyuk, 2010), as well as on the influence of the quality of life on the sense of security (Baker & Palmer, 2006; Rakauskiene & Strunz, 2016; Bilevičienė et al., 2016; Moumen et al, 2019; Cherchyk et al., 2019).

The theory which comprehensively tackles the sense of security is a commonly known disorder theory (Kelling & Wilson, 1982). Also recognized under the label of broken-windows theory, it assumes that the sense of security may be contingent upon, say, the state of infrastructure, city development or living area. If the inhabitants of a given area notice so-called disorders (social ones – for instance, public drinking, or physical ones – for instance, broken window, neglected properties), they will subconsciously feel anxiety (Markowitz, Bellair, Liska, & Liu, 2001; Ross, Mirowsky, & Pribesh, 2001; Sampson & Raudenbush, 1999).

What is important for the present paper are the suggestions – from time to time appearing in the subject-matter literature – that the very malfunctioning of a society itself (for instance, public drinking) may directly arouse fear, even in the case when it is not accompanied by any genuinely dangerous event (e.g. picking a fight or assault) (Ross & Jang, 2000). Therefore, local security is a function of a social system developed by its inhabitants. Thus, local security is a variable that can assessed with the help of surveys. The level of disorder may be a relatively easily available indicator of local security. It appears in the form of, say, poor conservation, ranging from loose waste to neglected greenery, or broken windows and doors (O’Brien & Wilson, 2011). Similar
research was conducted in Poland with respect to the city of Poznań (Bogacka & Siniecka, 2016), or Cracow (Market Research Word, 2017). Broad research over the sense of security was conducted by the authors of the present paper in the area of Kuyavian-Pomeranian voivodeship (Siemiątkowski & Tomaszewski, 2018).

In order to ensure security to its citizens, the state realizes a plethora of tasks and implements numerous initiatives (Moldovan, 2018; Szpak, 2015). This process is continuous, institutionalized and it requires proper legal regulations and some solutions of organizational nature. Government and self-government institutions, private entities and the legal regulations consolidating them which are responsible for the security of the state and of its citizens create the so-called national security, which is normally defined as “deliberately distinguished (from the system of the state) collective set of public authorities and public administration, other state authorities, armed forces, entrepreneurs and other organizational entities, social organizations of citizens performing some actions for the sake of ensuring national security (Chmieliński, 2018), internally coordinated and mutually dependent on each other by virtue of some management system with respect to the realized mission which is the defence and security of the state, with the state being a political territorial and social institution, and with a view to ensuring undisturbed living conditions conducive to the self-fulfillment of both an individual person and of the whole society; and with the intention to secure people’s life and health, their welfare (gauged by both tangible and intangible goods) and of natural environment in all the stages of the state’s functioning (in a state of normality, in the times of crisis and in the states of exception) (Kitler, Drabik, & Szostek, 2014, p. 11).

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![Diagram of the system of national security of the Republic of Poland](source: Kitler, 2014, p. 243)

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The system of national security encompasses – among others – internal security. Actually, the framework of internal security system overlaps with thus presented system of national security (see: figure 1). The security of local communities, on the other hand, includes “[…]– proportionally to the size of a community in question – all the elements of the former system (that is, of the one of internal security), which are: regime security, social order, personal security, public security, public order, which are of nation-wide character; but it also includes the needs, problems, possibilities and forms of activity that are peculiar to a given local community” (Fehler, 2009, p. 24).

In the light of the fact that it is normally a commune that is an organization of local community and is also the form of the organization of its administration, it is a commune itself that will play a crucial role in the system of local security (Leszczyński, Gumieniuk, Owczarek, & Mochocki, 2013, p. 37). Its elements will be the same executive subsystems which comprise the system of national security; however, only with respect to the functions shifted from the governmental level to the one of local government (see: figure 2).

However, the scope of operations of particular tiers of territorial self-government was diversified. Satisfying collective needs of a community is one of the duties incumbent upon a commune. The said duties encompass – among others – issues related to public order, citizens’ security and anti-fire as well as anti-flood protection (Ustawa z dnia 8 marca 1990 r. o samorządzie gminnym, 2001, art.7, ust.1, pkt 14). Powiat, on the other hand, performs the legislated public tasks of supra-communal nature – among others – the ones regarding public order and citizens’ security (Ustawa z dnia 5 czerwca 1998 r. o samorządzie powiatowym, 2001, art.4, ust.1, pkt 15).
A local government of a voivodeship executes voivodeship-related tasks which are regulated by legal acts – among others – those regarding public security (Ustawa z dnia 5 czerwca 1998 r. o samorządzie województwa, 2001, art.14, ust.1, pkt 14). At the same time, pursuant to art. 3 of Police Act, governor and the head of a commune (mayor, the president of a city) or starost wielding power of general administration or the bodies of a commune, poviats and local government of a voivodeship execute tasks pertaining to security provision or public order in accordance with the principles set forth in the relevant acts (Ustawa z dnia 6 kwietnia 1990 r. o policji, 2017). Furthermore, the local government may perform the tasks stemming from the acts and local law bills through appointing municipal police (Ustawa z dnia 29 sierpnia 1997 r. o strażach gminnych, 1997).

The security-related tasks with the exception of public order executed by the local government (commune and poviats) include, among others:
- Environment and nature protection;
- Fire protection;
- Social support;
- Conservation of monuments;
- Supporting disabled people (Urban, 2011, pp. 33–40);
- Health promotion and health protection as such, including combating drug addiction and counteracting alcoholism.

At this point, it should be added that most frequently in the context of territorial self-government, security is perceived in terms of security and public order conceived of as a desirable state of affairs (when it comes to safety, order and public peace), which should enable normal development of social life involving abiding by the law holding at that time as well as obeying extra-legal norms pertinent to the enforcement of public order (Osierda, 2014, pp. 89–106; Serafin & Parszowski, 2014, p. 33). We can also assume, following the footsteps of Zdzisław Jagiełło, that public security reduces to “the entirety of the conditions and institutions protecting life, health and property of citizens as well as national wealth, regime and sovereignty of the state against the phenomena threatening the legal order and achievements of democracy” (Jagiełło, 2015, p. 10).
Therefore, oftentimes in the context of managing security of local communities, the issues related thereto are delegated to the operations of dedicated services and of inspection (combined administrations), which mainly consists in reacting to occurring events. Therefore, it is the paradigm of ‘combat readiness’ that prevails here. From this perspective, what plays the crucial role in the perception of local community security are services, organizations and the institutions directly dealing with public-security-related issues, such as police, fire brigades (both professional and volunteer ones), municipal police and also the following inspections: sanitary, veterinary, inspection of environment protections and of construction supervision. The above-stated approach downgrades important elements of local security such as, say, interpersonal bonds, social involvement of the people inhabiting a certain area; or else – the capability of cooperation between self-government power – non-governmental organization, and services.

3. Methodology and research process

The fragmentary results of the pilot research described in the forthcoming part of the present paper constitute an introduction to an intended broader and deeper study on local security. The purpose of conducting this pilot research was to examine the sense of security of the inhabitants of Kuyavian-Pomeranian voivodeship. Moreover, the aim was to discover how they assess the selected (by them) factors that the level of the said security is a function of.

It was local communities of Kuyavian-Pomeranian voivodeship on the level of poviats that were subjects of this study. Therefore, the respondents inhabited the area of 19 poviats and 4 cities with poviat rights. It was also attempted to deliberately diversify the research sample in terms of gender and age.

The study poses three following research questions:

P1: How do the respondents assess the sense of security in their local environment?
P2: What are the basic areas posing a threat to security in their local environment?
P3: How are the basic elements of the local security system assessed?
P4: What and to what degree determines the sense of local communality?
P5: What are the perspectives for changes in the sense of security on the part of the members of the local community?

Furthermore, the following hypotheses were assumed:

H1: Due to a relatively low criminality rate in the region, security of the members of the local communities is mainly determined by the factors of economic nature.
H2: There are considerable differences in the sense of security between the inhabitants of countryside and municipal areas.
H3: The participation in local elections has a bearing on the perception of security in the local environment.

The study was conducted between November 2017 and February 2018. For this purpose, survey method was applied (a questionnaire) with the elements of field research (observation, free-form interview). This triangulation allowed for taking heed of these elements which were skipped in the prepared survey as well as for capturing the essence of particular poviats. It was third-year students of internal security major that dealt with the acquisition of empirical data during their classes pertaining to security of local communities. Then, the data was aggregated and subject to statistical analysis. As hinted upon above, this is pilot research. Due to the impossibility of ensuring complete reliability of the process of the acquisition of empirical data, the results obtained cannot justify drawing apodictically true conclusions. However, taking into the number of forms obtained and filled in (about 4,4 thousand), even potential and minute errors may be subsumed under the category of a statistical error.

In the present paper, what was presented were only introductory and (additionally) fragmentary results of the study conducted. However, due to the formal restrictions, related on the one hand to the size of the text publishable; and to the wide-scope nature of the study in question on the other, what is then presented below is a mere fraction of the much broader analysis. Still, the results presented are, in the present authors’ opinion, highly informative anyhow.
4. Results and discussion

The sense of security of the people being members of a given local community is a function of many various factors. Sometimes in subject literature, the local level of security is erroneously identified with security and public order; and thus only classical elements of the state’s security system are considered. At the same time, one fails to take into account so-called soft security, the determinants of which play a vital role in ensuring well-being to the members of local communities. Therefore, they significantly fill in the gap in the framework of the indicators of security on the local level.

On the basis of the obtained results, we can make a claim that the inhabitants of local communities of Kuyavian-Pomeranian voivodeship feel rather secure in their habitat. When presented with 1-10 scale to assess the said sense of security, the majority of the respondents picked 8 – as much as 22,4% of them (see: fig. 3).

Still, it does not alter the fact that 19,4% of the respondents, presented after all with the same scale, judged their security in the place they inhabit as lying somewhere in the spectrum between 1 and 5. It means that 1/5 of the respondents, while making an assessment in the studied area, focused on threats rather than on the absence thereof. However, once we take into consideration the fact that almost 10% of this group of respondents in this case opted for value 5, there are less than 10% of persons left who really feel insecure in their habitat. Opting for 5 in thus modeled scale should be construed as the assessment “I feel neither secure, nor insecure”.

![Fig. 3. Sense of security of the inhabitants of Kuyavian-Pomeranian voivodeship (in % of all the choices on 1-10 scale)](image)

Source: our own work on the basis of the results obtained by studying the respondents.

Much more respondents assessed their sense of security within 6-8 spectrum. Overall, the answers of 56,5% of the respondents fell into this range. It means that the majority of the respondents who answered this very question feel relatively safe in their habitat. Therefore, in their assessment in this area, they mainly consider the advantages resulting from the fact of living with and keeping the company of a given community, rather than any potential dangers stemming therefrom.

In the cited study, what was subject to the assessment made by the inhabitants of Kuyavian-Pomeranian voivodeship was the functioning of particular (selected) elements of local communities security systems. One took into consideration those constituents of the system the inhabitants dealt with on a daily basis. They were also assessed by the respondents. Among all the elements assessed, it was the operations of fire fighters that were evaluated as best. The vast majority of the respondents assessed this group within the spectrum 8-10. Overall, 70% of all the respondents thus evaluated the fire department (see: fig. 4).
Fig. 4. Assessment of the functioning of the fire brigade by the inhabitants of Kuyavian-Pomeranian voivodeship (in% of all the choices on 1-10 scale)

*Source:* our own work on the basis of the results obtained by studying the respondents.

Fig. 5. Assessment of the functioning of the police by the inhabitants of Kuyavian-Pomeranian voivodeship (in% of all the choices on scale 1-10)

*Source:* our own work on the basis of the results obtained by studying the respondents.

Such a result is little wonder. The quality of services provided by fire brigades have been widely recognized and relied on by the society for years (GUS, 2015). The work that fire-fighters are doing is mainly a helping hand lend to a society as a whole, which applies not only in the case of fire but also in other critical situations. Volunteer fire stations oftentimes host a variety of events for local communities. Many inhabitants actively participate therein. The participation in the associations of volunteer fire department is often regarded as a tradition; or even – a duty. Fire department is not perceived as an oppressive constituent of the security system, which accounts for it being highly regarded. In this context, it should be underlined that both national fire service and volunteer fire department constitute one of the most important elements of security for local communities both during critical situations, natural disasters, situations related to technical, and especially medical, rescue. Furthermore, fire fighters are thought of as exerting direct influence on security on the local level.

What is slightly worse assessed is the second most important service providing security to the inhabitants of local communities that is the police (see: fig. 5). It would be an overstatement to say that the respondents assessed the police extremely negatively; however, the assessment in this case was conspicuously worse than in the case of fire department. In the distribution of the assessments within 1-10 scale, there are three clusters noticeable in this case. The first one occurs within the spectrum 1-4, into which 21% of the respondents’ answers fall. These assessments should be regarded as relatively negative and it must be conceded that they are rather numerous. What can here serve as a viable explanation is the fact that among the respondents there was a large of number of young people, ranging between 18 and 24 years old. These people follow the trend of denying traditional norms and therefore, they treat the police as an oppressive service, thus perpetuating negative opinions on the malfunctioning of law enforcement agencies.
The most numerous group of respondents fell into 5-8 spectrum; overall there were 61% of the respondents within this range. The remaining part thereof; that is slightly more than 17%, gave the police the highest scores. To summarize, it must be stated that the inhabitants of Kuyavian-Pomeranian voivodeship assess the functioning of the police slightly above the average. However, there is a significant part of the inhabitants of local communities that is not satisfied with the workings of this group.

It would be worthwhile to juxtapose the above data with the results of all-Polish research. What stems from the latter is that in 2016, 72% of the respondents highly appraised the police, and 16,5% evaluated it negatively. In 2017, over three fifths of Poles (strictly speaking, 62%, which from March dropped by 8 percentage points) evaluate it positively; and one fourth (25%, an increase by 9 percentage points) criticize it (CBOS, 2017). One of the most significant constituents of the security system of local communities are local and regional self-government authorities. For it is these (as noted above) that are to a large extent responsible for the majority of important areas of security and they, being empowered by law, diligently discharge their duty to reduce the potential of local dangers. The assessment of local government is always essentially erroneous. The respondents, while making the said assessment, are presumably driven by their respective personal sympathies towards the representatives of a given local government. Still, it is worthwhile to take a closer look at how the members of local communities assess the institutions which are directly responsible for organizing the system of local security (see: fig. 6).

Analysis of the results of the conducted study indicated that within the spectrum of lowest scores, the highest authorities of local government (head of a commune, mayor, president of a city) are evaluated worse than previously-described police. It was as many as 25% of the respondents that chose the scores within 1-4 range, which is 4 percentage points more than in the case of the appraisal of the police. Also, the two highest scores; that is, 9 and 10, were given by a significantly smaller proportion of the respondents. It was only 10% of them that picked the above scores.

The reason for such an assessment is ambiguous. During the interviews, with the interviews being conducted parallel to surveys, the inhabitants of local communities recalled (the above-mentioned) political antipathies. This sort of attitude is (especially in the countryside) quite common. Even in the case when the authorities demonstrate some considerable initiative or when they attract some external funds to finance their investments, it still does not necessarily have a bearing on their being positively perceived by the inhabitants.

![Fig. 6. Assessment of the functioning of the highest bodies of local government by the inhabitants of Kuyavian-Pomeranian voivodeship (in % of all the choices on scale 1-10)](Source: our own work on the basis of the results obtained by studying the respondents.)
One of the key conditions for maintaining a high level of local security is the quality of education system, including education on security. In this respect, school is becoming a significant element of local communities security system. However, the role of school in this system is still more important. After all, school, for the most part of the day, becomes a guardian of children and youth. Ensuring security to one’s descendants is an important determinant of the quality of life and of the efficiency of parents’ labour.

The assessment of school, perceived as a constituent of local communities security system, by the inhabitants of Kuyavian-Pomeranian voivodeship remains at a relatively high level (see: fig. 7). This institution was evaluated as better than authorities of local government and police. Over 17.5% of the respondents’ choices fell within the range of the weakest scores, that is within 1-4, which is significantly less than in the case of the previously-described institutions. Taking into consideration the fact that a significant part of the respondents were young people, oftentimes being still beneficiaries of the education system, such assessments are to be regarded as highly positive. In case of the highest scores – 9-10 – the percentage of choices falling within this range was higher than in the case of the assessment of local government authorities; yet, lower than in the case of the police. Overall, almost 14% of all the respondents gave highest scores.
Health care has been for many years a target of, on the one hand, complaints by the society; and on the other hand, of desperate attempts at reforms initiated by successive governments. So far, one has not managed to work out in Poland such a model of health care that would fully satisfy social needs and which would not be at the same time a burden for the national budget. However, what can come as a surprise is the fact that given such overgrown welfare payments, health care is virtually forgotten. Hence, it is ill, elderly or disabled people that are deprived of the possibility of dignified life, treatment or rehabilitation.

Health care is another key element of local communities security system. It is on its conditions (including the competences of and the proper number of employees, technical level of the equipment used therein) that our health – and oftentimes even people’s lives – mainly depends. Without a proper quality of the service in question, the main goal of the security system would be under threat, the goal being assurance of the endurance of the main reference object of security, that is of an individual person. Hence, what is in danger is the persistence of local community, of which an individual person is the ‘most primitive constituent’.

The inhabitants of local communities of Kuyavian-Pomeranian voivodeship assessed the quality of health care moderately (see: fig. 8). The majority of the respondents gave it the score of 5 (on 1-10 scale) – this applied to as many as 19% of them. Over 36% of them submitted the score lower than 5. There were relatively few highest scores; that is ranging between 9 and 10 – slightly over 7%. The picture emerging from this data shows that in the eyes of the respondents, the quality of health care is barely average, which actually even leans towards a negative assessment. After all, there were more people submitting the scores within 1-5 (about 55% of the respondents) than within the range 6-10 (about 45%).

Certainly, one would be unwarranted in doing this sort of generalizing, especially having considered the fact that health care in Poland is underfinanced and taking into account the opinions expressed on this issue while the survey was being conducted, the assessment made by the inhabitants of local communities of Kuyavian-Pomeranian voivodeship is sufficiently good. The quality of health care is differentially assessed in the countryside and in cities. In Kuyavian-Pomeranian voivodeship, there were, in 2016, 612 health care facilities in cities; whereas in village areas, there were 222 of them (GUS, 2017, p. 236). Moreover, it was not specified whether what was meant was a general practitioner or specialist medical examinations. The age of the respondents in this respect was not irrelevant either.

The data stemming from the conducted study may be juxtaposed with all-Polish information from, unfortunately, 2016. Almost each fourth respondent (23%) is satisfied with the functioning of health care, whereas three fourths of them (74%) are dissatisfied. After a rather sharp increase in the satisfaction derived from the functioning of health care, with the said increase having been recorded two years ago; in this year we rather witnessed more severe criticism of the public service in question. A percentage of the people satisfied with its
workings dropped (by 5 percentage points), whereas the percentage of those dissatisfied increased (by 6 percentage points) (CBOS, 2016, p. 3).

The next element of local communities security system being subject to the assessment made by the inhabitants of various parts of Kuyavian-Pomeranian voivodeship was local media. Their role in the process of ensuring security is also vital. Most of all, they are a medium of information – among others – on threats and potential dangers. Nowadays, when reality changes dynamically, the promptness and reliability of received information cannot be overestimated. In order to effectively manage security, local security inclusive, one should ensure practically immediate access to a stream of information. It is precisely media and thus also social media (for instance, local web portals) that play a key role therein. Media (also referred to as ‘fourth power’) are not only a vehicle for information. They also shape opinions and to some degree the attitudes on the part of their receivers. Furthermore, media indubitably constitute one of the pillars of civil society. The assessment of local media (see: fig. 9) among the respondents was high if we assume that the score of 5 on the given scale was an average score. After all, as many as 17.8% of the respondents gave media the said score of 5 and 41.9% of the people under study assessed media within the range of 6-8. As far as extreme assessments go, their respective counts do not dramatically differ: the media is assessed as very good by 4.8% of the respondents; and as very bad by 6.5% of them.

![Fig. 10. Level of satisfaction with the functioning of non-governmental organizations in Kuyavian-Pomeranian voivodeship (in % of the all the choices on 1-10 scale)](image)

*Source: our own work on the basis of the results obtained by studying the respondents.*

![Fig. 11. The influence of the Church on the sense of local communality (in % of all the choices on 1-10 scale)](image)

*Source: our own work on the basis of the results obtained by studying the respondents.*
The authors of the present paper came to the conclusion that an important element of the social environment which contributes to the sense of security is non-governmental organizations. Establishing non-governmental organization is always an expression of will of some group of people, with the group being centered around a specific problem or a need. Subject literature enumerates many functions normally attributed to non-governmental organizations. What is meant by ‘a function of non-governmental organization’ is its mission or role for which the organization in question was appointed in the first place. One and the same organization may successfully perform a few distinct roles. From the perspective of security, what plays an important role are both the organizations conducive to building local bonds; for instance, the associations of historical profile, and the ones oriented towards taking actions in the realm of security such as “Caritas”, PCK [Polish Red Cross], WOPR [Volunteer Water Rescue Service] or OSP [Volunteer Fire Department]. It follows from the conducted study that the level of satisfaction with the activities of all sorts of non-governmental organizations is estimated as moderately good or relatively positively. On the other hand, zooming in on extreme scores again, it must be stated that negative opinions prevail - 7,1% (see: fig. 10). Taking into account whether the respondents participate in the elections, and thus they meet at least one of the minimal criteria of political involvement, non-governmental organizations are assessed in much worse a fashion by the respondents not taking part in the elections; that is, by as many as 10,3% of them; whereas it is only 4,5% thereof that assess the said organizations positively. The majority of the respondents gave the non-governmental organizations the scores ranging from 5 to 8, and this group constituted 54,9% of the overall number of respondents.

Very much alike as in the case of non-governmental organizations, the authors came to the conclusion that the involvement on the part the Church in the actions promoting security amount to a significant indicator. What was mainly at stake is the operations of Church organizations for the sake of social security. In this study, what was clearly delineated was the bad perception of the Church as an institution. Moreover, it was men that regarded Church more negatively than women did; and what is curious is that there were no significant differences in assessments between village areas and cities. In case of the most extreme negative opinions, which were selected by 11,6% of the overall number of respondents, the distribution of the choices in question between subjects inhabiting cities and village areas was as follows: 11,9 % of the respondents from cities and 11,2% of the respondents from village areas picked these extremely negative assessments under consideration (see: fig. 11). Similarly, when it comes to the most positive assessments, which were, incidentally, selected less frequently than corresponding positive ones, the differences between the respondents from cities and from village areas were only minute. 6% of the overall number of the respondents picking these extremely positive assessments was distributed between the respondents from cities and from village areas in the following manner: 6,7% of the respondents from village areas and 5,2% of the respondents from cities picked the extreme positive assessments under consideration. The negative assessments were made more frequently by men, which coincides with all-Polish tendency; whereas the positive scores were given by the society regarded as traditional, which basically implies the inhabitants of village areas.

Due to the space limits of the present paper, we cannot describe the results of the studies with respect to all possible variables (gender, habitat, participation in elections or age). That is why, the authors will merely pay attention to a few selected significant differences in the assessment of particular areas of the security system, with a more in-depth analysis dedicated to the more inquisitive reader, by putting all the relevant data in table 1.

The basic conclusion emerging after the analysis of the data included in table 1 is that, on average, there are no considerable differences in the distribution of the assessment of the elements of the security system under scrutiny once we consider the so-called respondents’ particulars. It does not imply that it is impossible to point to some cases wherein the said differences are more conspicuous. The most significant (in the authors’ opinion) differences in particular assessment on the 1-10 scale were marked in gray; and in one case – in red.
### Tab. 1. Assessment of the functioning of the selected elements of the security system on the local level made by the inhabitants of Kuyavian-Pomeranian voivodeship – cross-sectional analysis (in % of all the choices on 1-10 scale)

<table>
<thead>
<tr>
<th>The area assessed</th>
<th>Section</th>
<th>Scale of scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>1</td>
</tr>
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</tr>
<tr>
<td></td>
<td>Men</td>
<td>0,8</td>
</tr>
<tr>
<td></td>
<td>Cities</td>
<td>1,0</td>
</tr>
<tr>
<td></td>
<td>Village areas</td>
<td>0,6</td>
</tr>
<tr>
<td></td>
<td>Participation in elections</td>
<td>0,8</td>
</tr>
<tr>
<td></td>
<td>Non-participation in elections</td>
<td>0,9</td>
</tr>
<tr>
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<td>Women</td>
<td>0,3</td>
</tr>
<tr>
<td></td>
<td>Men</td>
<td>0,5</td>
</tr>
<tr>
<td></td>
<td>Cities</td>
<td>0,4</td>
</tr>
<tr>
<td></td>
<td>Village areas</td>
<td>0,5</td>
</tr>
<tr>
<td></td>
<td>Participation in elections</td>
<td>0,4</td>
</tr>
<tr>
<td></td>
<td>Non-participation in elections</td>
<td>0,4</td>
</tr>
<tr>
<td>Police</td>
<td>Women</td>
<td>1,9</td>
</tr>
<tr>
<td></td>
<td>Men</td>
<td>5,4</td>
</tr>
<tr>
<td></td>
<td>Cities</td>
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</tr>
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<td></td>
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</tr>
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</tr>
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<td></td>
<td>Non-participation in elections</td>
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</tr>
<tr>
<td>Head of a Commune/Mayor/President</td>
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<td>4,9</td>
</tr>
<tr>
<td></td>
<td>Men</td>
<td>4,9</td>
</tr>
<tr>
<td></td>
<td>Cities</td>
<td>4,5</td>
</tr>
<tr>
<td></td>
<td>Village areas</td>
<td>5,5</td>
</tr>
<tr>
<td></td>
<td>Participation in elections</td>
<td>3,1</td>
</tr>
<tr>
<td></td>
<td>Non-participation in elections</td>
<td>7,1</td>
</tr>
<tr>
<td>School (the level of education for enhancing security)</td>
<td>Women</td>
<td>2,6</td>
</tr>
<tr>
<td></td>
<td>Men</td>
<td>2,6</td>
</tr>
<tr>
<td></td>
<td>Cities</td>
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</tr>
<tr>
<td></td>
<td>Village areas</td>
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</tr>
<tr>
<td></td>
<td>Participation in elections</td>
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<tr>
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<td>Non-participation in elections</td>
<td>3,6</td>
</tr>
<tr>
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<tr>
<td></td>
<td>Men</td>
<td>7,4</td>
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<tr>
<td></td>
<td>Cities</td>
<td>7,1</td>
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<tr>
<td></td>
<td>Village areas</td>
<td>7,1</td>
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<tr>
<td></td>
<td>Participation in elections</td>
<td>5,9</td>
</tr>
<tr>
<td></td>
<td>Non-participation in elections</td>
<td>8,5</td>
</tr>
<tr>
<td>Satisfaction with the functioning of local government authorities</td>
<td>Women</td>
<td>6,8</td>
</tr>
<tr>
<td></td>
<td>Men</td>
<td>5,4</td>
</tr>
<tr>
<td></td>
<td>Cities</td>
<td>4,6</td>
</tr>
<tr>
<td></td>
<td>Village areas</td>
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</tr>
<tr>
<td></td>
<td>Participation in elections</td>
<td>3,1</td>
</tr>
<tr>
<td></td>
<td>Non-participation in elections</td>
<td>7,0</td>
</tr>
</tbody>
</table>
When assessing sense of security by the inhabitants of local communities of Kuyavian-Pomeranian voivodeship, there occurred some differences when it comes to the highest scores. It was men, rather than women, who opted for such a high sense of security, which comes as no surprise. Furthermore, the inhabitants of village areas felt more secure than city dwellers. Fire department was assessed much better by the inhabitants of village areas as well as by the persons taking part in the last local government elections.

When it comes to assessing the police, there were the sharpest differences occurring in case of the lowest scores granted thereto with regard to the respondents’ gender, wherein it was men that gave a larger number of negative scores than women did. In case of the highest scores given to the police, the inhabitants of local communities participating in the elections assessed the police much better.

Assessments of a head of a commune/mayor/president radically differed within the range of the lowest scores in case of the people not having voted in the last local government elections. This subset of respondents evaluated their authorities much worse. The most notable diversities occur in the assessment of health care as an element of the local security system. Within the range of the lowest scores (1-5) the above area of security is assessed more negatively by men than by women. Overall, it was 55% of all male respondents that gave scores falling into 1-5 range, whereas only 9% of all female respondents made corresponding assessments. It means that it was women that made the majority of positive assessments. As many as 70% of the overall number of women granted the scores within 7-10 range, as compared with 16.5% of all the male respondents assessing health care. How to account for this difference? Perhaps women more frequently become beneficiaries of health care (due to the fact – among others – of their guardianship over children), whereas men made their respective assessments based on hearsay.

The dissatisfaction with the functioning of local authorities was expressed (within the range of the lowest

<table>
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<tr>
<th></th>
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<td>4.9</td>
<td>5.9</td>
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<td>15.0</td>
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<tr>
<td>Women</td>
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<td>5.8</td>
<td>8.4</td>
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<td>15.0</td>
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<td>4.5</td>
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<tr>
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<td>4.7</td>
<td>7.6</td>
<td>10.2</td>
<td>18.1</td>
<td>16.0</td>
<td>16.5</td>
<td>11.2</td>
<td>5.7</td>
<td>5.0</td>
</tr>
<tr>
<td>Village areas</td>
<td>9.5</td>
<td>7.1</td>
<td>8.0</td>
<td>10.4</td>
<td>17.2</td>
<td>14.1</td>
<td>14.4</td>
<td>10.3</td>
<td>4.0</td>
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<tr>
<td>Participation in elections</td>
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<td>4.8</td>
<td>6.8</td>
<td>10.4</td>
<td>18.0</td>
<td>16.3</td>
<td>16.6</td>
<td>11.9</td>
<td>4.8</td>
<td>4.7</td>
</tr>
<tr>
<td>Non-participation in elections</td>
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<td>6.7</td>
<td>8.9</td>
<td>10.1</td>
<td>17.5</td>
<td>14.1</td>
<td>14.5</td>
<td>9.7</td>
<td>5.4</td>
<td>4.9</td>
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</table>

Satisfaction with the functioning of non-governmental organizations (associations, the farmers’ wives’ association, LGD [Local Action Group])

<table>
<thead>
<tr>
<th></th>
<th>Women</th>
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</thead>
<tbody>
<tr>
<td>Women</td>
<td>7.2</td>
<td>7.7</td>
<td>11.8</td>
<td>14.1</td>
<td>19.1</td>
<td>14.1</td>
<td>11.6</td>
<td>9.0</td>
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<td>1.8</td>
</tr>
<tr>
<td>Men</td>
<td>7.8</td>
<td>6.4</td>
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<td>13.1</td>
<td>8.3</td>
<td>4.4</td>
<td>5.7</td>
</tr>
<tr>
<td>Cities</td>
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<td>7.4</td>
<td>9.4</td>
<td>12.1</td>
<td>17.7</td>
<td>15.1</td>
<td>14.1</td>
<td>8.6</td>
<td>4.4</td>
<td>4.1</td>
</tr>
<tr>
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<td>9.0</td>
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<td>14.2</td>
<td>11.2</td>
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<td>8.1</td>
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<td>16.4</td>
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<td>10.9</td>
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<td>11.9</td>
<td>8.1</td>
<td>3.9</td>
<td>5.4</td>
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The influence of the Church on the sense of communality

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<td>4.8</td>
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<td>8.7</td>
<td>4.1</td>
<td>3.2</td>
</tr>
<tr>
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<td>8.9</td>
<td>7.0</td>
<td>7.5</td>
<td>7.5</td>
<td>10.3</td>
<td>8.6</td>
<td>14.3</td>
<td>6.9</td>
<td>9.3</td>
</tr>
<tr>
<td>Cities</td>
<td>11.9</td>
<td>6.6</td>
<td>9.3</td>
<td>11.0</td>
<td>14.8</td>
<td>13.4</td>
<td>12.1</td>
<td>10.3</td>
<td>5.1</td>
<td>5.4</td>
</tr>
<tr>
<td>Village areas</td>
<td>11.2</td>
<td>6.8</td>
<td>7.7</td>
<td>9.2</td>
<td>14.6</td>
<td>13.0</td>
<td>11.9</td>
<td>12.8</td>
<td>5.8</td>
<td>6.9</td>
</tr>
<tr>
<td>Participation in elections</td>
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<td>5.9</td>
<td>8.1</td>
<td>10.4</td>
<td>14.9</td>
<td>14.0</td>
<td>12.9</td>
<td>12.5</td>
<td>5.9</td>
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<td>9.3</td>
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<td>9.9</td>
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<td>5.2</td>
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</table>

Estimation of prospective changes in your (qua member of a local community) sense of security in the forthcoming year

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<th></th>
<th></th>
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<th></th>
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<td>3.9</td>
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<td>Men</td>
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<td>9.2</td>
<td>23.2</td>
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<td>3.3</td>
</tr>
</tbody>
</table>

Source: our own work on the basis of the results obtained by studying the respondents.
scores) by a greater number of women than that of men. Also, the respondents not participating in the local government elections were dissatisfied with local authorities to a greater degree. The assessment of local media was slightly better in case of women, who definitely gave a large number of higher scores as compared with men. On the other hand, the respondents participating in the local government elections gave media significantly smaller number of the lowest scores.

Within the higher scores possible (10), it was rather men and village-area dwellers that expressed their satisfaction with the functioning of non-governmental organizations. On the other hand, the people not participating in the last local government elections gave non-governmental organization a greater number of the lowest scores (ranging with 1-3). There were significant differences when it comes to the assessment of the influence of the Church on the sense of local communality. It was men who gave significantly larger number of negative scores to this institution (20%) rather than women (4,5%). When it comes to the score of 5 (which is to be considered the middle point of the scale), considerable differences can be observed. In case of the score of 5, 20% of the overall number of women went for this evaluation and only as many as 7,5% of all the men subject to analysis. Finally, within the range 9-10 fell a greater number of assessments made by women than men, both evaluating the influence of the Church. This distribution demonstrates that in case of men, what is observable is a considerable polarization of the assessment of the said institution.

Conclusions

The sense of security of the inhabitants of local communities of Kuyavian-Pomeranian voivodeship was at a relatively high level. The great majority of the respondents assessed it (on 1-10 scale) at the level of 6 or more. The sense of security is a function of many factors and is nothing but a derivative of a complex system of local security sketched in the first section of the present study. Among the selected elements of the system in question, the respondents assessed the functioning of fire department as best. What was assessed as definitely the worst was the functioning of health care and of non-governmental organizations. What came as a sort of surprise are relatively poor (given the allegiance to tradition exhibited by Polish society) scores given to the influence of the Church on the sense of local communality, with a relatively frequent scores falling in 1-4 range.

On the basis of the above-stated fragmentary results of the study, it is worthwhile to refer again to hypotheses 2 and 3 formulated in the introduction. When it comes to the former, there are genuine differences in the sense of security city dwellers and inhabitants of village areas. The respondents inhabiting village areas assessed their respective security much better than city dwellers. However, as far as particular constituents of local security system go, the differences were not so significant. Still, the estimation of prospective changes in the sense of security was again more hopeful (believing in greater security in the future) in case of the inhabitants of village areas. sense of security.

When it comes to hypothesis 3, which assumes that the participation in elections influences one’s perception of security in the local environment, the results of the study were slightly different. The authors assume that the very act of voting is a symbol of a conscious perception of one’s own local community; and hence, it was believed that the respondents who took part in the last local government elections are bound to regard both their sense of security and particular constituents of local security system higher, compared to the respondents who refrained from the participation in the elections. However, this hypothesis was to a large degree falsified. Actually, the results of the study do not indicate any significant differences in the sense of security of these two distinct groups. What is noticeable is that the persons not participating in the last local government elections – and hence, not taking an elementary action for the sake of the administration of local community – evaluate the administration in question as worse as compared to the people that did take part in the elections. The similar situation applies when it comes to the assessment of the remaining constituents of local security system, especially within the range of lowest scores. It might be conjectured that this results from some general assessment of the state, which is also reflected in the perception of community-based organization on the local tier.
The respondents were asked to make an assessment of prospective changes in the sense of security of local communities. What is interesting is that the majority of them gave in this respect the scores ranging from 5 to 8, which amounts to 71.6% of all the respondents; which basically demonstrates that optimists prevail over pessimists (see: fig. 12). These results closely approximate the estimation of the sense of security within 5-8 range. Overall, this kind of response was then recorded in 66.4% of all the subjects (see: fig. 3).

Therefore, it should be claimed that the inhabitants of local communities of Kuyavian-Pomeranian voivodeship assess the prospects for the changes in question moderately, with a slight inclination towards more-than-average scores. The prospective changes in the sense of security are evaluated more hopefully by the inhabitants of village areas than by city dwellers. 27.5% of the respondents inhabiting village areas’ responses fell into the range of the highest scores (7-10). At the same time, only 19% of city dwellers estimated the said prospects that high (7-10). A slightly larger number of the lowest scores in this respect was given by the respondents not taking part in the local government elections.

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SECURITY OF THE EURASIAN ECONOMIC UNION MEMBER STATES: SOCIOECONOMIC AND FINANCIAL ASPECTS

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Abstract. The Eurasian Economic Union (EAEU) system of the economic security is required to form the path of efficient development of the Common Economic Space (CES). The aim of the study is to quantify economic security and develop measures to ensure macroeconomic stability of the EAEU member states. The index estimation method, cross-country comparisons of indicators, and the expert ranking method were selected for research. The authors’ method of calculating the integral index of economic security of an integration association has been presented, which includes three groups of indicators: development of the national economy, social and financial security. The results of the analysis have revealed that the highest level of economic security has been established in the Russian Federation and the Republic of Belarus. However, low GDP per capita in all EAEU countries, as well as low rates of GDP growth, production, industrial production, and value added in agriculture and gross capital formation in the largest EAEU member state – the Russian Federation, and a large volume of foreign currency borrowings in Belarus and Kyrgyzstan affect the level of economic security of the integration association. The most important threats to economic security have been identified as a result of expert ranking: tougher sanctions, depreciation of national currencies, and spontaneous migration processes. The results of the study allow the authors to conclude that measures must be developed to coordinate monetary policies, as well as to expand integration in the social and labor spheres.

Keywords: financial security, economic security, financial mechanism, state budget revenues, tax policy, foreign exchange policy, EAEU financial market


JEL Classifications: 01

1. Introduction

The efficient development of the countries in the post-Soviet space is backed by integration processes, which are described by the achievement of an aggregate financial result based on the unification of the economic potentials of each member of the integration union in the economic aspect.

The collapse of the USSR led to the destruction of a single complex of traditional economic ties among the regions in the former republics and the emergence of crisis phenomena associated with the disintegration of the Soviet economy. The space for economic maneuver by various types of resources has narrowed as a result of the isolation of the economic systems of the CIS countries.

Creation and development of new independent states were accompanied by the emergence of threats to their national economic security, the most important of them being low competitiveness of economies, raw-materials export model of development (in Russia and Kazakhstan, in particular), technological backwardness, relative underdevelopment of business, instability of the financial system, unbalanced budgets, and a model of the national economy, characteristic of developing countries (Bulkhairova, 2019).
In order to counter the risks and threats to national economic security, a system of integration ties began to form in the post-Soviet space. The EAEU was created in 2015 as a result of some initiatives aimed at achieving economic integration. The EAEU currently includes five former republics of the USSR: Russia, Kazakhstan, Belarus, Armenia, and Kyrgyzstan.

The priority areas of the EAEU economic development are ensuring macroeconomic stability of the member states, creating conditions for the growth of their business activity and investment attractiveness, increasing the availability of financial resources and the formation of a single financial market, and innovation-driven growth and modernization of the economy (Murashbekov, 2019).

The EAEU member states are currently faced with new risks and threats of loss of economic sovereignty, such as an increase in geopolitical risks, complication of geoeconomic situation, difficulties in interaction between independent states (Lipinsky, et al., 2019).

The further development of the national economies of the EAEU states becomes unpredictable without efficient mechanisms for economic integration and creates additional threats to the development of the integration association.

As such, the study of the socioeconomic and financial aspects of the security of each of the EAEU member states and the integration association as a whole is an urgent problem.

2. Literature review

The study is based on the theory and methods associated with the fundamental academic writings on the economic security issues. The international organization OECD notes that the economic policy of member states is the main idea of the security of integration association (OECD, 2019). The unified economic policy of the CES should integrate the elements of economic security of each EAEU member state (Czerewacz-Filipowicz, 2019).

Despite certain positive results in the study of this phenomenon, there is currently no unified, consistent scientific concept of economic security (Kulik, & Petrenko, 2017; Moumen et al., 2019).

The problem is compounded by the fact that the phenomenon of economic security is systemic, multilevel and dynamic, and application of knowledge in various fields of science is required in the course of its study.

Several approaches to determining economic security can be defined based on the existing scientific developments.

- Using the “stability” term. According to this approach, the interpretation of the “economic security” concept implies a stable state of the economy, its security from external and internal threats. Proponents of this approach include Abalkin (1994), Afontsev (2012), Kormishkin et al. (2016), Petenko (2012), Plotitsyna (2003), Glazyev (2010), Gerasimov et al. (2018).

- Using the “independence” term. Proponents of this approach interpret economic security as the state of social production that would allow to achieve economic sovereignty and ensure the ability of the national economy to constantly develop, update, and improve (Ronis, 2011; Ostapiuk, et al., 2017; Novoselova, et al., 2016; Ilyin, 2016; Karanina, & Kartavyh, 2018; Gorodetsky, 2016).

The current state of the economy, which allows to determine and establish domestic policy in social, economic and other spheres without any significant external influences, can be considered the safest (Nam, et al., 2016).

- Using the “interests” term.

According to this approach, the stability of economic development and independence in any of the above understandings are included in the area of economic interests of the state (Shpilevskaya, 2016a).
Proponents of this approach include A. Porokhovsky (2016), V. Senchagov (2017), A. Tatarkin and A. Kuklin, (2012), E. Shpilevskaya (2016b) et al., who associate the country’s economic security with a state of the national economy that allows to ensure national-state interests.

Many writings are devoted to the study of certain aspects of the national economic security, including its relationship with the policy of import substitution (Burbina, 2019; Simanovskaya, & Silanteva, 2016; Tetushkin, 2016), the study of sociocultural (Dyshaeva, 2019; Kostin, & Kostina, 2013; Buranova, & Getmanskaya, 2015), administrative, and legal aspects (Markina, 2016; Yerkeev, 2011; Fabuš, Csabay, 2018; Nikitina et al., 2018; Finogentova et al., 2018), the innovative component (Khan, 2018; Zakharkina, et al., 2018; Kozlova, 2009; Mikhaylov et al., 2018; Sagiyeva et al., 2018; Shevyakova et al., 2019), etc. Attempts were made in some writings to develop a system of measures that would take all the functional components of economic security into account, including the social and financial security of the state (Tsvetkov, et al., 2019; Batkovskiy et al., 2018; Gerasimov et al., 2018; Mackevičius et al. 2018).

As such, the considered approaches form the theoretical basis for the development of the national economic policies in individual countries. At the same time, it must be noted that the social and financial aspects of economic security currently remain poorly understood.

Besides, the need to take advantage of integration cooperation is growing in the context of globalization and aggravation of geopolitical risks in the post-Soviet space. This circumstance dictates the need for further research and development of conceptual directions for strengthening economic security within the EAEU integration association.

The goal of this study is to assess the level of economic security and study the social and financial aspects of stabilizing the macroeconomic situation of the EAEU member states.

It can be assumed that an important condition for strengthening the economic independence of the integration association is to improve cooperation in the monetary policy and to expand the integration of the EAEU countries in the social and labor spheres.

3. Methods

Three groups of sources were used to prepare the article, described by a high degree of reliability and relevance of information:

- Official publications of the Eurasian Economic Commission, the Eurasian Development Bank, the Analytical Center under the Government of the Russian Federation, national government bodies, and public organizations;
- Electronic databases of the World Bank, the UN, national statistical services, etc.
- Academic publications containing experimental research, collections of academic writings, monographs, conference proceedings, etc., and
- Regulatory framework and regulatory background information on the EAEU.

The index method of assessment and cross-country comparisons of economic security indicators are the main research methods.

The authors’ method for calculating the integral index of economic security is proposed in order to measure the level of economic security of the EAEU member states.

The integral index \( I \) is found using the following formula:
\[ I_{es} = \frac{I_{rs} + I_{ss} + I_{fs}}{3} \]  

where

- \( I_{rs} \) is the index of the national economy development,
- \( I_{ss} \) is the social security index, and
- \( I_{fs} \) is the financial security index.

Each of the above indices is found using the following formula:

\[ I = \sum_{i=1}^{n} w_i \cdot x_i \]  

where \( w_i \) is the weight coefficient reflecting the significance of the i-th partial indicator, and \( x_i \) is the normalized value of the i-th partial indicator.

The principal component method was used to determine the weights, the advantage of it being the use of official statistics. All weights in this study were taken equal and found using the following formula:

\[ W = \frac{1}{n}, \text{where} \ n \text{ was the number of partial indicators in the group.} \]

The partial indicators are normalized in order to assess the degree of their remoteness from threshold criteria. This is done by finding the coefficient of achievement of the threshold criterion using the following formulas:

- \( X_i = q_i / q \text{ for the case where a situation with the actual value of the indicator being not lower than the threshold value is considered safe, and} \)
- \( X_i = q_i / q \text{ for the case where a situation with the actual value being not higher than the threshold value is considered safe.} \)

The threshold values are the average values of the indicators of the EU integration association. Threshold values for the indicators “annual deficit of the consolidated budget of the government sector” and “debt of the government sector” are accepted as those set in Article 63 of the Treaty on the EAEU.

In addition to quantitative assessment, an expert ranking method was used in order to identify threats to the economic security of the EAEU member states. The expert group consists of 20 experts with a high level of competence in matters of social, financial, and economic development of the EAEU. The questionnaire was used as the main method of the expert assessment. The assessment result is represented as a ranked series of major threats to the security of economic development.

4. Results

The Treaty on the EAEU entered into force in 2015, the main purpose of it being to strengthen national economies and member states and promote their sustainable economic growth.

The EAEU began to function in the context of a significant transformation of the world economy and the formation of new centers of economic development. Toughening global competition, reducing commodity and geographical markets, intensifying negative trends in sociodemographic development, increasing the importance
of technological development as an essential factor for manifesting economic development opportunities, and reducing useful natural resources as one of the competitive advantages of countries all pose serious global challenges and jeopardize sustainable development of the EAEU member states.

At the same time, despite the persisting challenges and threats, as well as unfavorable foreign market situation, the EAEU member states pursue an active policy to strengthen their economic security and implement national socioeconomic development strategies.

The EAEU member states differ by the size of economy and growth rates. A significant difference in GDP is observed not only between the largest and smallest economies – Russian and Kyrgyz, but also between the Kazakh and Belarusian economies. For example, per capita GDP in Russia is 8.4 times higher than that of Kyrgyzstan, and 2.7 times higher than that of Armenia.

Indicators of the development of the real sector of the economy of the EAEU member states are shown in Table 1.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Indicator type</th>
<th>Threshold value</th>
<th>Armenia</th>
<th>Belarus</th>
<th>Kazakhstan</th>
<th>Kyrgyzstan</th>
<th>Russia</th>
</tr>
</thead>
<tbody>
<tr>
<td>GNI per capita, Atlas method, USD</td>
<td>Actual value</td>
<td>35,359</td>
<td>4,230</td>
<td>5,670</td>
<td>7,830</td>
<td>1,220</td>
<td>10,230</td>
</tr>
<tr>
<td></td>
<td>Normalized value</td>
<td>1.00</td>
<td>0.12</td>
<td>0.16</td>
<td>0.22</td>
<td>0.03</td>
<td>0.29</td>
</tr>
<tr>
<td>Added value in agriculture (annual increase in %)</td>
<td>Actual value</td>
<td>1</td>
<td>-8.5</td>
<td>-4</td>
<td>3.4</td>
<td>2.7</td>
<td>-2</td>
</tr>
<tr>
<td></td>
<td>Normalized value</td>
<td>1.00</td>
<td>0.00</td>
<td>0.47</td>
<td>0.00</td>
<td>0.79</td>
<td>0.00</td>
</tr>
<tr>
<td>Added value in manufacturing (annual increase in %)</td>
<td>Actual value</td>
<td>1.7</td>
<td>2.2</td>
<td>5.1</td>
<td>4.2</td>
<td>6.2</td>
<td>2.9</td>
</tr>
<tr>
<td></td>
<td>Normalized value</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Gross capital formation, annual growth, %</td>
<td>Actual value</td>
<td>4.2</td>
<td>28.5</td>
<td>4.4</td>
<td>3.3</td>
<td>11.3</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td>Normalized value</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>0.79</td>
<td>1.00</td>
<td>0.19</td>
</tr>
<tr>
<td>Expenditure for research and development (% of GDP)</td>
<td>Actual value</td>
<td>2.03</td>
<td>0.23</td>
<td>0.59</td>
<td>0.64</td>
<td>0.11</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>Normalized value</td>
<td>1.00</td>
<td>0.11</td>
<td>0.29</td>
<td>0.32</td>
<td>0.05</td>
<td>0.54</td>
</tr>
<tr>
<td>National economy development index $I_{ps}$</td>
<td>Actual value</td>
<td>1</td>
<td>0.45</td>
<td>0.58</td>
<td>0.46</td>
<td>0.58</td>
<td>0.40</td>
</tr>
</tbody>
</table>

Source: compiled by the authors using the data from the World Bank (2019)

The Russian Federation holds a leading position in terms of per capita GDP among the EAEU member states. However, due to unfavorable external conditions (sanctions) and the current policy in Russia (increase in the VAT rate, pension reform), the index of the national economy development in 2018 was low.

Kyrgyzstan demonstrated the impressive dynamics of the growth rate of value added in manufacturing and agriculture as on the end of 2018.

Table 2 presents the results of the assessing social security indicators of the EAEU member states as on the end of 2018.
Table 2. Social security indicators of the EAEU member states

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Indicator type</th>
<th>Norm.</th>
<th>Threshold value</th>
<th>Armenia</th>
<th>Belarus</th>
<th>Kazakhstan</th>
<th>Kyrgyzstan</th>
<th>Russia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross savings (% of GDP)</td>
<td></td>
<td></td>
<td></td>
<td>23</td>
<td>14</td>
<td>29</td>
<td>26</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>Actual</td>
<td></td>
<td></td>
<td>1</td>
<td>0.61</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Unemployment, total (% of total labor force)</td>
<td></td>
<td></td>
<td></td>
<td>6.8</td>
<td>17.7</td>
<td>5.7</td>
<td>4.9</td>
<td>7.2</td>
</tr>
<tr>
<td>(according to ILO)</td>
<td>Actual</td>
<td></td>
<td></td>
<td>1</td>
<td>0.38</td>
<td>1.00</td>
<td>1.00</td>
<td>0.94</td>
</tr>
<tr>
<td>Share of the population living on less</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>50</td>
<td>1</td>
<td>9</td>
<td>66</td>
</tr>
<tr>
<td>than USD 5.5 (as of 2015)</td>
<td>Actual</td>
<td></td>
<td></td>
<td>1</td>
<td>0.06</td>
<td>1.00</td>
<td>0.33</td>
<td>0.05</td>
</tr>
<tr>
<td>Share of the working population, total (% of</td>
<td></td>
<td></td>
<td></td>
<td>57</td>
<td>59</td>
<td>64</td>
<td>71</td>
<td>62</td>
</tr>
<tr>
<td>the total population aged 15 and older), %</td>
<td>Actual</td>
<td></td>
<td></td>
<td>1</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Coefficient of age dependence</td>
<td></td>
<td></td>
<td></td>
<td>31</td>
<td>17</td>
<td>22</td>
<td>11</td>
<td>7</td>
</tr>
<tr>
<td>(% of the elderly in the working population)</td>
<td>Actual</td>
<td></td>
<td></td>
<td>1</td>
<td>0.55</td>
<td>0.71</td>
<td>0.35</td>
<td>0.23</td>
</tr>
<tr>
<td>Social security index $I_{rs}$</td>
<td></td>
<td></td>
<td></td>
<td>1.00</td>
<td>0.52</td>
<td>0.94</td>
<td>0.74</td>
<td>0.64</td>
</tr>
</tbody>
</table>

Source: compiled by the authors

The state budget surplus was observed in Belarus, Kazakhstan, and Russia in 2018. The budget deficit was 1.6 % of GDP in Armenia and 0.3 % in Kyrgyzstan. At the same time, the revenues of the national budgets of most EAEU member states demonstrated substantial growth in 2018. The budget revenues grew by 8.3 % in Armenia, by 116.8 % in Belarus, by 0.5 % in Kyrgyzstan, and by 19.7 % in Russia. Revenues of the national budget of the Republic of Kazakhstan decreased by 13.7 %.

An increase in budget expenditures was observed only in the Republic of Belarus in 2018. The budgetary expenditures decreased by 4 % in Armenia, by 6.6 % in Kyrgyzstan, by 5.4 % in Russia, and by as much as 18.1 % in Kazakhstan in 2018.

All member states of the Union ensured that the state levels were in compliance with the limit quantitative value of the inflation rate established by the Treaty on the EAEU within 107.5 % in 2018. The size of public debt exceeded the threshold level of 50 % in two out of five countries (Armenia and Kyrgyzstan), the main reason being a sharp weakening of national currencies. The lowest level of financial security was observed in the Kyrgyz Republic.

The results of calculating the integral index of economic security indicate that the Russian Federation and the Republic of Belarus occupy the strongest positions among the EAEU member states (Figure 1). The economies of Armenia and Kyrgyzstan are the most vulnerable.
The questionnaire of experts has revealed threats to the economic security of the EAEU member states (Figure 3), the main ones being tougher sanctions, depreciation of national currencies, and spontaneous migration processes.

Tightening sanctions rhetoric by the US and the EU against the Russian Federation may lead to further depreciation of the ruble, capital outflows, higher inflation, problems in the financial sector, and a reduction in foreign trade (Sayfieva, et al., 2019).
According to the experts, instability of the national currencies in the EAEU member states is the second most important threat to the economic security of the integration association. Due to the high share of foreign currency in the balance of payments in the largest national corporations and the savings of the population, sharp fluctuations in the exchange rate of the national currency can undermine the price and income system and the operation of national financial and banking systems.

An unfavorable demographic situation and spontaneous migration processes in the labor market are also a significant threat to economic security. This phenomenon represents a danger of increased criminalization of the economy and social differentiation of the population of the EAEU member states.

5. Discussion

The successful formation of a common EAEU market largely depends on many factors, including the social and financial aspects of economic security. As such, the economic security of countries largely depends on the terms of trade within the countries of the union, which, in turn, directly depend on the exchange rate, interest rate, and inflation.

The experts participating in the survey believe that the EAEU member states need to achieve progress in three areas in order to coordinate monetary policies: reduce inflation, increase dedollarization, and strengthen national currencies. The authors consider it important to clarify the term “dollarization”. This is a phenomenon of the international monetary market, where foreign currency (most often USD) is widely used for operations within the country or certain regions of the world, up to the complete replacement of the national currency. Accordingly, dedollarization is the reverse process.

The problems of dependence of the EAEU member states on dollarization were explored in the expert discussion “Dedollarization in the EAEU member states: practice and prospects” held on March 29, 2018. The experts noted that the issue of the USD dominance in the global financial system was increasingly gaining political importance – the US currency was a powerful tool to influence all countries without exception and economic entities of the whole world (Valdai Discussion Club, 2018). The issue of reducing dependence on the USD is becoming a key condition for successful independent development in an era when economic sanctions and the manipulation of financial flows have become a lever not only of competition, but also of political pressure.

At the same time, some experts agree that favorable background for the active promotion of dedollarization has been established in the EAEU member states: economic growth and trade turnover are recovering, largely driven by investment growth. Although the economies of the EAEU member states are still described by a high degree of financial dollarization, various control measures applied in the member states of the union have already yielded some progress and a decrease in dependence on the USD. This, in turn, can contribute to the rapprochement of monetary policies of the states and further deepen integration within the EAEU.

A high level of dollarization has been a characteristic feature of the EAEU member states over the past 30 years: for example, the share of deposits in foreign currency was between 41 % and 70 % in 2015 – 2016. This was due to a high inflation rate, a long period of using a fixed exchange rate, and frequent periods of financial instability. The share of deposits in foreign currency in the total volume of the EAEU broad money supply has significantly decreased since 2016. For example, dollarization decreased from 72 % to 60 % rate in the Republic of Belarus, from 42 % to 27 % in Russia, and from 51 % to 31 % in the Republic of Kazakhstan.

According to Alexander K. (senior economist in the bank, survey participant), positive changes occurred due to a series of measures taken by central banks and governments of these countries. The expert notes that these measures should continue: national currencies should be used more in government borrowing, macroeconomic environment should improve, and foreign financing should be replaced with domestic. As for the EAEU member states, active mutual trade will also contribute to this (Ananiev, et al., 2019).
Other experts believe that dollarization and dedollarization are not linear but cyclical, since the economies of the leading EAEU member states – Russia and Kazakhstan – are highly dependent on fluctuations in oil prices: national currencies depreciate as oil prices fall. According to the experts, extensive economic integration involving countries whose economies are not dependent on commodity prices, such as India and China, is an efficient measure to combat dependence on the USD.

The growth of domestic trade is a prerequisite for improving the economic security of the EAEU member states. However, some problems exist: an uneven distribution of both volumes and growth of trade within the union (Russia being the leader), a disproportionate focus on foreign markets, and a reliance on oil and gas resources. Along with other factors, this presents the union with many challenges that it will have to deal with in the coming years.

In order to increase domestic trade between the EAEU member states, the work on removing the existing barriers should be continued, thereby moving towards the formation of common markets for services, capital, and labor.

Expanding the integration of the EAEU member states in the social and labor areas becomes an urgent task in this context. A legal framework has been developed that regulates the simplified procedure for the adoption of citizenship and border crossing, creation of equal conditions for social security and medical services for labor migrants, and accounting for the employment records. The agreements on the mutual recognition of documents on education and the formation of preferential conditions for the development of small and medium enterprises, etc. have been concluded.

The EAEU member states have already felt the consequences of removing barriers to the labor market. For example, labor migrants from Kyrgyzstan and Armenia have become more competitive when applying for jobs in Russia and Kazakhstan. Unlike migrants from other countries, they do not need to obtain a work permit. Labor migrants from the EAEU member states are entitled to receive medical care and some social benefits in the countries of stay.

At the same time, the issue of implementing the pension rights of labor migrants from the EAEU member states remains a problem. Significant differences in the pension systems of the Union member states is the main reason for this.

The experts note that not all EAEU member states form pension rights for workers at the moment (E. Gulmado娃, Head of the Social Protection Department of the Eurasian Economic Commission). Their formation has been provided for by the legislation of the Republic of Armenia and the Russian Federation since 2014 and by the Republic of Belarus since 2016. They apply to citizens with a status of temporary residents.

The pension rights of temporarily staying labor migrants are not being formed in the Republic of Kyrgyzstan, i.e., contributions to Pension Funds are not paid for them. Besides, there is no mechanism for transferring a pension even though the legal framework is established. As a result, the worker who has worked for a few years in another state of the Union, does not receive their pension in full after returning to the homeland and applying for it.

The work is currently underway to develop an agreement on the provision of pensions for workers as part of the creation of a single labor market for the EAEU. This agreement will allow them to form, maintain and further realize their pension rights that were formed in the state of the Union they worked in.

It must be noted that the pension agreement was designed in such a way that national pension systems were not changed. The issues of ensuring the preservation of the transfer of pension rights in case of relocation within the union are the key norms of this document. The experts note the importance of legitimate employment, since illegal labor migration leads to a lack of conditions for the pension rights formation.
As such, this agreement will ensure social protection and the right to a pension to citizens who temporarily work in the territory of another EAEU member state in accordance with the national legislation.

Conclusion

The results obtained in the course of the study allow to draw the following conclusions:

- The highest level of the economic security among considered countries is observed in the Russian Federation and Belarus. However, low growth in both value added in agriculture and gross capital formation weaken the macroeconomic stability of these countries;
- Extensive foreign currency borrowings have led to a sharp increase in government debt in percentage of GDP in the national currency. At the same time, this indicator remains low in the two largest countries of the EAEU – Russia and Kazakhstan, which ensures macroeconomic stability for the whole association.
- The main threats to the economic security of the EAEU member states have been identified based on the results of an expert assessment: toughening sanctions, depreciation of national currencies, and spontaneous migration processes.
- It is necessary to develop and implement a number of measures aimed at reducing inflation, dedollarization and strengthening the national currencies of the EAEU member states in order to coordinate monetary policies.
- The growth of domestic trade is a necessary condition for improving the economic security of the EAEU member states. This necessitates the development of measures to expand the integration of the EAEU countries in the social and labor areas.

One of the significant barriers to the creation of a common labor market in the EAEU is the lack of legal mechanisms for implementing the pension rights of labor migrants from the EAEU member states.

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INDUSTRIAL ZONE DEVELOPMENT AND INTERNAL MIGRATION ISSUE IN VIETNAM: EVIDENCE FROM BINH DUONG PROVINCE

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Abstract. Vietnam is still classified as a low-income country with GDP per capita at 2,587 USD in the year 2018, as per the classification by World Bank Atlas method. Therefore, industrialization is set as an appropriate policy for economic development. In Vietnam, industrial zone establishment is planned, developed and controlled by the state in order to accelerate the industrialization process. This article discusses about the importance and impact of industrialization and ongoing internal migration, as a result of industrial development, on socio-economic development by reviewing the relationship among them using multivariate statistical and comparative research methods. Case study research methodology has also been used by the researchers to examine the positive and negative impacts of immigration on infrastructure of destination locality. The article presents the statistical data and the practical experience gained in Binh Duong province which has a huge number of industrial zones and with highest in-migration rate in the country; a detailed analysis of the challenges faced by local governments is presented with the appropriate recommendations for policymaking.

Keywords: industrialization, industrial zone, internal migration, urban infrastructure, environmental impact


JEL Classifications: O13, O14, O15, O18, O44, P48, R23, Q50, Q51, Q56, R11

Additional disciplines: ecology and environment; environmental engineering

1. Introduction

The process of industrialization is an inevitable path to be followed for the economic development of middle- and low-income countries. In developing countries, economic growth has always been emphasized as an important and essential base to solve a row of social issues such as income inequality, poverty, social insurance, general education, etc.

The development of Industrial Zone (IZ) or Industrial Park (IP) is considered as a crucial policy to promote the industrialization and modernization of the country (Bezpalov et al., 2019; Batkovskiy et al., 2018; Fomina et al., 2018; Mikhaylov, 2018).

IP refers to an area which is set aside for industrial facilities without the explicit purpose of facilitating or promoting the provision of common infrastructure and services (UNIDO, 1997; Falcó, 1999; Golovina, 2013; Tatarkin, 2013; Garina et al., 2017).
The role played in the development of IZs confirmed that the IPs are essentially important in the process of promoting industrialization, modernization, contribution to the development of the country’s infrastructure, upliftment in the competitiveness of industrial plants, acquisition of labour force and support to control potential pollution and innovation links followed by scientific research (Azizov, 2014; Sosnovskikh, 2017; Noufal, Ramachandran, 2016; Sugiantiningsih et al., 2019; Rahayu et al., 2019). But the close relationship between IZ establishment and Internal Migration (IM) within the country has not been clearly investigated. Vincenzo Bovea and Leandro Elia (2017), in their study of migration that discussed about its diversity and impact on economic growth, used data on global bilateral migration during 1960–2010 to compute diversity indices and stated that those migrants who move from one country to another carry a new range of skills and perspectives which nurture technological innovation and stimulate economic growth. At the same time, increased heterogeneity may undermine social cohesion; create coordination and communication barriers, and adversely affect the country’s economic development. In other words, despite any reason, migration has both positive as well as negative impacts on economic development of the host country or destination places.

In Vietnam, regarding the relationship among IZ development, labour market demand and internal IM, Cu, Chi Loi (2005) used comparative methods and economic growth models and found that the industrialization of Vietnam is characterized by the creation of dynamic economic zones in different parts of the country. The strong development in cities and industrial areas has generated sufficient jobs for migrants who are willing to work and take any job that helps in improving their life.

The first IZ was established in the year 1957 at Viet Tri town, Vietnam. By the end of 2018, Vietnam has a total of 326 IZs established across the country, with 249 already in operation (Shira, 2019). The household data report titled ‘The 2015 Internal Migration Survey’ conducted by Vietnam General Statistics Office (GSO) with United Nations Population Fund (UNFPA) cooperation concluded that 13.6 percent of Vietnam’s population are migrants. In comparison with other countries in Southeast Asia, this rate is not high as observed in Cambodia (29.8 percent), Myanmar (19.3 percent), Timor-Leste (17.7 per cent) and Lao PDR (16.7 percent) (UNESCO, 2018). This study is limited to assessing the impact of IZ development and ongoing massive IM in Vietnam on socio-economic development of the localities inhibited by migrants. The current study aims at understanding the establishment of IZs, current IM issues and its possible impacts to ensure sustainable development.

2. Materials and methods

To highlight the reasons why Vietnamese move from one place to another, the current study used a model of migration research i.e., “Push and Pull factors” to identify the behavior of Vietnamese migrants in the context of country’s industrial development. Push and Pull factors are known in the form of a model that explains why people migrate. Push factors encourage people to leave their native and settle elsewhere, while pull factors attract migrants to new place (Grigg, 1977; Rasool et al., 2012; Škuflić et al., 2018; Todorov et al., 2018).

The comparative research method was also used by the authors to analyze the impact on social-economic development of the migrant-accepting localities. The linkages between IZ development and migration and their impacts on comprehensive sustainable development of destination locality were determined by authors and were confirmed on the basis of data from published studies, official statistics from Vietnam’s GSO and statistics on economic-social development of Binh Duong province as it is one of the provinces that exhibit rapid economic growth, dynamic industrial development and highest net-migration rate in Vietnam.

3. Results

3.1. Vietnam internal migration: An overview of changes in the nature and motives of IM

The population in Binh Duong province has mechanically increased, thanks to massive immigration, as a consequence of rapid industrial development and IZ expansion. A case of high net-migration rate (Table 1), population growth and IZ development in Binh Duong are typical evidence for the relationship among them.
Table 1. Binh Duong Migration rate in 2005-2017 (%)

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>In-migration rate</td>
<td>27.2</td>
<td>42.3</td>
<td>73.2</td>
<td>89.6</td>
<td>64.8</td>
<td>59.1</td>
<td>54.5</td>
<td>70.2</td>
<td>52.0</td>
<td>32.3</td>
<td>30.6</td>
</tr>
<tr>
<td>Out-migration rate</td>
<td>9.2</td>
<td>15.2</td>
<td>5.1</td>
<td>15.0</td>
<td>22.1</td>
<td>10.2</td>
<td>19.9</td>
<td>18.2</td>
<td>10.0</td>
<td>8.8</td>
<td>6.7</td>
</tr>
<tr>
<td>Net-migration rate</td>
<td>18.0</td>
<td>27.1</td>
<td>68.1</td>
<td>74.6</td>
<td>42.7</td>
<td>48.9</td>
<td>34.5</td>
<td>52.0</td>
<td>42.0</td>
<td>23.5</td>
<td>23.9</td>
</tr>
</tbody>
</table>

Source: GSO, 2018b, pp. 113-118

Nguyen, Thi Hien (2016), when studying the economic situation in Binh Duong province, discovered the fact that economic growth is directly proportional to population growth. The authors used the secondary statistical data presented in Figures 1 and 2 and Table 1 to evaluate this statement and define the relationship between IZ development and ongoing IM.

The results of ‘The 2015 Internal Migration Survey’ shown in Figure 3, contribute to the evaluation and analysis of characteristics of the migration flows that occurred due to socio-economic changes in the recent years. The migration increased in the age group of 15-19 from 11.5 percent in 2004 to 13.1 percent in 2015 denoting the education and early youth employment as reasons for growth in migration trend. Next, the largest migration rate (72 percent) contributed by the young people group aged in the range of 20-39 who often move from poor rural areas with the hope to improve their life.
3.2. Impact of IZ development in Vietnam

Positive impacts

In the context of Vietnam, IZs have positive impact on social-economic development mentioned below.

Contribution to economic growth and restructuring of national and regional economy; accelerating the process of industrialization and urbanization.

A country’s economy growth is associated with industrialization process and IZ development. It can be noted from Figures 1 and 2 that the positive increase in country’s GDP in accordance to the number of IZs simultaneously. Economic structural change is commonly understood as the change in distribution of economic activity and productive factors among various sectors of the economy. The economic sector data presented in Figures 4 and 5 shows a decrease in the rate of agriculture and increase in the rate of industry and services towards the structure of GDP. For example, in the national economic structure of 1990, agriculture, forestry and fishing sector contributed 38.74 percent, industry and construction sector accounted for 22.67 percent whereas the service sector contributed 38.59 percent (Tax-less subsides on production has not been separated). However, in 2018, the data for the relevant areas were 14.57 percent, 34.28 percent and 41.17 percent respectively (Tax-less subsides on production was 9.98 percent). The same trend was observed in the provincial level too i.e., in provincial GRDP of Binh Duong province. The corresponding figures were 26.2 percent, 45.5 percent and 28.3 percent for 1996, and 3.08 percent, 63.87 percent and 23.94 percent (the Taxes less subsides on production was 9.98 percent 9.11 percent) for 2018.
The process of urbanization has a close relationship with industrialization and IZ development planning, which is one of the factors that stimulates migration and accelerates urbanization in the past two decades (Tables 1 and 2).

### Table 2. Net-migration rate by region of Vietnam in 2010-2017 (in percent)

<table>
<thead>
<tr>
<th>Region</th>
<th>2010</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red River Delta</td>
<td>0.5</td>
<td>-0.5</td>
<td>0.0</td>
<td>0.5</td>
<td>0.0</td>
</tr>
<tr>
<td>Northern midlands and Mountain areas</td>
<td>-3.9</td>
<td>-2.0</td>
<td>-1.9</td>
<td>-2.5</td>
<td>-1.1</td>
</tr>
<tr>
<td>Northern Central and Central Coastal areas</td>
<td>-5.7</td>
<td>-1.8</td>
<td>-1.8</td>
<td>-1.1</td>
<td>-0.2</td>
</tr>
<tr>
<td>Central Highlands</td>
<td>-0.3</td>
<td>1.6</td>
<td>-1.1</td>
<td>-2.4</td>
<td>-0.7</td>
</tr>
<tr>
<td>South East</td>
<td>19.9</td>
<td>11.2</td>
<td>9.7</td>
<td>8.4</td>
<td>5.6</td>
</tr>
<tr>
<td>Mekong River Delta</td>
<td>-8.4</td>
<td>-6.7</td>
<td>-5.4</td>
<td>-4.6</td>
<td>-4.0</td>
</tr>
</tbody>
</table>

*Source: GSO, 2018b, pp. 117-118*
The rural areas that surround the city, where IZs located, were merged into the city; developing rural areas, where IZs were arranged, were altered in accordance to the Master plan development into satellite towns of industrial centers or big cities. The suggestions in this study were confirmed by the results of ‘The Vietnam Population and Housing Census 2009’ which identified several exceptions related to provinces, where high concentration of IZs exists with huge demand for migrant labour (GSO, 2011). The presence of those exceptions and outliers refers a diversification of pull factors.

Creation of favorable environment to attract foreign investment and mobilize internal capital

According to World Bank Atlas method classification, Vietnam was classified as a low-income country with GDP per capita at 2,587 USD in the year 2018 (GSO, 2018a) whereas the country’s economic growth model is based on export-led growth and domestic demand. Therefore, the investment capital for the expansion of production has a great demand, and attracting the investment capital is one of the Vietnam government’s top policies on socio-economic development (Progunova and Bogatyreva, 2019). By the end of 2018, IZs and other economic zones attracted 7,500 domestic projects worth 41.75 billion USD and around 8,000 foreign projects with a total capital over 145 billion USD (Shira, 2019).

Creation of jobs and promoting the formation of the labour market

In 1986, the central-planning economic model was preferred in Vietnam; the allocation of all resources, including the labour force, must comply with the order and plans of the State. However, as per the policy of renovation (“ĐổiMới” in Vietnamese) and “Open Door”, the government implemented vigorous reforms on the economy transition from centralized planning economy to market one (Nguyen, 2014). The companies especially, light industry enterprises located in IZs and specialized in manufacturing textiles, garments, footwear, and electronics, etc., attract huge number of employees. In the entire country, the headcount of workers occupied in industry and construction sector increased from 5 million (13 percent of the total) in the year 2000 (GSO, 2006) to 13.8 million (25.7 percent of the total) in 2017 (GSO, 2018b).

Contribution to create a new & modern infrastructure system in the country for long-term development and solving environmental protection issue

The IZ development is planned and controlled by the government of Vietnam as a step in long-term socio-economic development strategy. A set of quality parameters such as economic efficiency, social and environmental protection was determined and applied for IZ planning and designing since it is a prerequisite under Vietnam laws. Moreover, a complete IP needs to have its own infrastructure such as basic, technical, social and environmental systems so that it can operate effectively and sustainably while at the same time, it also reduces the environmental litigation risks and improve its persona.

Factors that induce large-scale IM inside the country

It is to be noted that the highest net-migration rate observed in Binh Duong province (68.1 percent in 2009; 74.6 percent in 2010 and 42.0 percent in 2015) and whole country are presented in Tables 1 and 3 for the year 2010-2017 when most of IZs were under construction. The differential variation of net-migration rate by region (Table 2) and percentage distribution of migration flows show the size of the population movement throughout the country. The ‘2015 National Internal Migration Survey’ addressed a series of problems that occur due to migration. The contribution from rural-urban migration flows was high, accounting for about 50 percent of overall migrants (Table 3).
Table 3. Percentage distribution of migration flows from places of birth to the current residence by types of migration

<table>
<thead>
<tr>
<th>Migration flows</th>
<th>Total (%)</th>
<th>Intra-provincial migration</th>
<th>Inter-provincial migration</th>
<th>Not identified</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total (%)</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Urban – Urban</td>
<td>18.0</td>
<td>4.9</td>
<td>7.7</td>
<td>5.4</td>
</tr>
<tr>
<td>Rural – Urban</td>
<td>49.8</td>
<td>13.6</td>
<td>33.4</td>
<td>2.8</td>
</tr>
<tr>
<td>Urban – Rural</td>
<td>2.9</td>
<td>0.9</td>
<td>1.9</td>
<td>0.1</td>
</tr>
<tr>
<td>Rural – Rural</td>
<td>29.2</td>
<td>4.7</td>
<td>17.1</td>
<td>7.4</td>
</tr>
<tr>
<td>Number of migrants*</td>
<td>4,969</td>
<td>1,231</td>
<td>2,838</td>
<td>900</td>
</tr>
</tbody>
</table>

*number of migrants responded to survey

Source: GSO, 2016;

Negative impacts

Pressure on the urban infrastructure system and public infrastructure due to fast growing number of IZs and abrupt population growth

Over 81.5 percent of migrants inhabited in rented houses in the provinces or big cities where IZs employ a large number of migrant workers in which most (61.7 percent) are self-migrants. The remainders migrated with family members such as spouse, children, parents, relatives and friends (GSO, 2016). Moreover, the ‘2015 Internal Migration Survey’ has shown that only one-third (31.7 percent) of the migrants possess professional and technical qualification and over a quarter (27 percent) graduated from high school (GSO, 2016). Binh Duong province has an area of 2694.6 km²; population density (person/km²) got increased from 252 in 1997 to 601 in 2010 (Nguyen, 2012) and finally 769 in 2017 which is nearly triple the number of country’s average population density (283 person/km²) (GSO, 2018b, pp. 79-80). The population of the province has tripled within two decades i.e., 1997-2017 (Figure 1).

The analysis and comparison of these real figures help to conclude that (a) a sudden population growth relates to an increase in the number of IZs during the same period; (b) in-migration is the main reason of population growth dominated by ‘push and pull factors’ according to the basic supply and demand law in the labour market. The indispensable role played by the migrants in the local development of Binh Duong province can be experienced through their absolute majority among workers who work in IZs: the total number of workers as of 1998 was 18,737 persons, of which 16,362 were immigrants i.e., 87.32 percent; by the end of 2016, these numbers increased to 373,433 and 335,429 (90 percent) respectively (Pham, 2018).

Environmental impact

According to the data registered by the Department of Environmental Protection, Binh Duong in July 2015, the total industrial wastewater flow in the province accounted for 140,000 m³ per day, of which 69,214 m³ from IZs and industrial cluster; the total volume of industrial solid waste reached 5,128 tons per day, (4,808 tons of non-hazardous industrial solid waste and 320 tons of hazardous solid waste). IZs located in the province cause huge toxic emissions, including dust 32,078 tons, SO₂: 349 tons, CO: 8,910 tons and NOX: 60 tons on an average every year (Pham, 2018).

Increase in the social problems including crime

According to the statistics of Binh Duong Police Department, from 2012 to 2016, there were 4,782 criminal offenses happened in IZs and industrial clusters, accounting for 82.5% of the total number criminal cases of the whole province (Phuong, 2017). This is another example that confirms the influence of IZ development on community life. In Dong Nai province from 2007 to 2017, a total of 24,728 crime cases with 41,890 defendants were tried by Dong Nai province’s People’s Courts, of which 1,947 crimes with 2,821 defendant perpetrated crimes were punished in IZs (Le, 2018).
4. Discussion

Through the investigation of relationship between the development of IPs and ongoing IM in Vietnam and in accordance to the analysis of successes of Binh Duong province in planning and implementing the development policies, turning negative impacts of the IZ establishment and migration issues into opportunities, this research paper proposes some recommendations, to which policy makers, advised to pay attention.

4.1. Addressing negative impact of IZ development and IM issue on infrastructure of migrant-receiving localities: Evidence from Binh Duong province

Huge immigration due to IZ development mounts heavy pressure on provincial infrastructure system that in turn threatens the local sustainable development. However, Binh Duong’s provincial government has made reasonable development policies to reduce the pressure and ensure normal life in the province. Binh Duong Province’s Master Plan (MP) named ‘Master Plan on Socio-Economic Development of Binh Duong province through 2020 and supplemented master plan through 2025’ on socio-economic development was approved by the Prime Minister in the year 2007 (Decision No. 81/2007/QD-TTg) and it was modified in 2014 (Decision No. 893/QD-TTg). Based on this MP, the plans and programs for the development of all sectors and fields were also formulated, including that of urban infrastructure development planning.

**Housing**

In order to promptly provide the accessible housing for low-income workers, Binh Duong province government had approved the program, ‘Program No. 27-CT/TU’ dated September 20, 2011 on social housing development during 2011 - 2015 with a goal to build 1,250,000 m² of total internal floor area so as to meet the demand for housing 125,000 workers who are employed in IZs. To implement this policy, the province has taken measures such as (1) providing necessary land fund for construction companies so that cheap apartments with floor area of 30 m² - 50 m² can be built and sold or rented to low-income workers; and (2) socializing housing provision by mobilizing the resources of local residents, private investors and companies located in IZs; The program yielded surprising and unexpected results. In this period, 82 social housing projects were incorporated with nearly 3,700,000 m² of internal floor area that tripled the target set for the period thus meeting the housing demands of more than 600,000 people. Among this data, more than 3,000,000 m² of boarding houses (equivalent to 182,289 apartments) were built by local individuals as well as households; 269.982m² were built by 200 enterprises located in IZs (Binh Duong Provincial Party Committee, 2015). The success is primarily attributed to the provincial government’s policy of mobilizing possible sources of investment to social housing.

**Education and health care**

In 1997, Binh Duong education and training sector had 2,819 classrooms, 4,905 teachers and 160,000 students (Phuong, 2016). With blooming development in the economy, these numbers increased rapidly based on large investment in education. According to ‘2018 Binh Duong Statistics Office Report’, up to November 2018, in the whole province, there are 723 educational and training institutions which consists of 365 kindergartens and preschools, 272 primary and high schools, 07 universities, 01 college with 78 professional secondary schools and vocational training centers. The share of private education sector is also relatively high i.e., 30 percent of the total number of education and training institutions; especially in preschool education, this share is about 66 percent (Binh Duong, 2018). The planning for human resource development in Binh Duong province for the period 2011-2020 refers to investment in education and training fields from domestic and foreign organizations, individuals and business owners.
Table 4. Number of health establishments and number of doctors in Binh Duong in 2005 and 2017

<table>
<thead>
<tr>
<th>Year</th>
<th>Total number of patient beds</th>
<th>Total number of doctors</th>
<th>Total number of health establishments</th>
<th>Of which</th>
<th>Hospital</th>
<th>Sanatorium and rehabilitation hospital</th>
<th>Regional polyclinic</th>
<th>Medical service unit in communes, precincts, offices and enterprises</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>1825</td>
<td>403</td>
<td>105</td>
<td></td>
<td>9</td>
<td>1</td>
<td>5</td>
<td>89</td>
</tr>
<tr>
<td>2017</td>
<td>3027</td>
<td>729</td>
<td>123</td>
<td></td>
<td>11</td>
<td>1</td>
<td>18</td>
<td>91</td>
</tr>
</tbody>
</table>

*Source: Binh Duong People’s Committee, 2018*

The growth in healthcare sector is exponential i.e., in the 12 years from 2005 to 2017, the number of doctors and hospital beds has nearly doubled; the number of medical facilities increased by 20 percent (Table 4). This achievement is also a part of the implementation of the Plan for the development of care, protection and improvement of people’s health in Binh Duong province to 2015 and orientations towards 2020 approved by the Provincial People’s Committee Decision No. 44/2012/QD-UBND October 16, 2012. According to the decision, the total capital for the period of 2012-2015 was 5,352 billion VND, of which 2,992 billion VND was allotted from budget and 2,360 billion VND from socialized (private organization and individual) sources. The ‘2018 Provincial People’s Committee Report’ on socio-economic situation inferred that in 2018, the number of beds to 10,000 people were 23 and the number of doctors to 10,000 people reached 7.46 which is still lower than the goals set in the provincial plan and the targets of the national strategy to protect, care, and improve public health during 2011 - 2020 period, orientation towards 2030 (26 and 9 by 2020).

**Transport**

The provincial government always combines the urban development and the development of public transport with an aim to build civilized and modern urban areas. The traffic and transport system of Binh Duong province was planned and invested in the direction of intimately-connecting the satellite towns and industrial centers with new city center of Binh Duong. It was specified in ‘The Binh Duong’s Transport Master Plan to 2020 with orientation towards 2030’ that: (1) planning transportation absolutely complies with long-term MP on provincial socio-economic development, ensuring convenient and safe traffic; (2) taking the planning of transport infrastructure development so that it would be able to connect the provincial transport system with the infrastructure of IZs, the national transport system and the southern key economic provinces. As per the statistics published in 1997, Binh Duong province had only 2,186 km roads of low quality under poor conditions. The provincial government has focused on mobilizing all the resources to develop transport networks. As of December 2016, the total length of the road system constructed in the province was 7,421 km (Saisho, 2017).

**Electricity supply**

In Binh Duong province, the demand for electricity from the foreign companies in and around industrial clusters, IZs and public service buildings such as hospitals, provincial government buildings, government offices and schools etc. is high. Therefore, along with infrastructure, the improvement measures with regards to the electricity supply such as new establishment, expansion or renewal of lines, substations, and installation of in-house electricity production facilities using renewable energy (sunlight, wind) are being implemented to reduce power consumption from the national grid and to stimulate energy saving as well as green energy use (Saisho, 2017).

**Water and waste treatment**

According to the data reported by the Department of Environmental Protection, Binh Duong in July 2015, 90% of the total industrial wastewater, industrial solid waste including hazardous solid waste in the province were collected, processed or destroyed (Pham, 2018). Besides the urban solid waste treatment plants and waste-
water treatment stations, 100 percent of the factories located in IZs have in-built waste treatment unit, water supply and drainage system whereas these wastewater treatment systems are connected with IZ general waste discharge system. By 2016, 100% of IZs were completely equipped with wastewater treatment system with a total design capacity of 107,600 m³ per day (Nguyen, 2016). It should be noted that there is a wide participation from the private sector in addressing key issues that are caused by migration as it mounts the pressure on urban infrastructure and public services of Binh Duong province.

Though IM becomes a common phenomenon, the characteristics of the migrants were relatively diverse: 13.6 percent of the total country’s population are migrants; the number of female migrants were 52.4 percent of the total population; only one-third of the migrants possess professional and technical qualifications; 31.4 percent of migrants move with their families (GSO, 2016). So, vocational training or retraining deserves more attention in development plans and policies. Migration-related policies should be responsive to most of the essential needs of the immigrants in terms of housing, healthcare, education, continuation of the disrupted education among migrant children in school ages, technical training for migrant workers and gender aspect.

Public-Private Partnership model, commonly termed as ‘Socialization’ was successfully applied in Binh Duong province, Vietnam, in urban infrastructure construction and meeting the needs of the migrants for affordable housing, accessible healthcare service, pre-school and general education with vocational training. Overcrowding puts a tremendous pressure on the infrastructure system of the city resulting in the economic losses and great inconvenience to people (travel time, transportation cost, traffic accidents, health problems, medical and other costs, etc.) thus in turn hinder the sustainable development. Thus, at national level, there must be coordination between central and local state agencies to reserve aside the areas or land fund for urban infrastructure development, public service and facilities and resettlement of residents. There must also be a coordination to formulate the criteria set for designing and building the infrastructure of IZs and firms located in it while setting up an IZ. This measure is very important as high population density and private constructions of the residents obstruct the infrastructure development in public service network incurring huge cost for site clearance. A good example for ground clearance would be Hanoi city. In order to construct the road spanning 2,274 m, about 785 billion VND (equivalent 35 million USD) was spent whereas the remaining amount over 6,000 billion VND was incurred only on land clearance and resettlement support (Trong Phu, 2018).

Currently, numerous issues with regards to technical training and the quality of graduates passed out from higher educational institutions need to be solved at the national level. When the data from ‘2018 Vietnam Labour Market Updated Newsletter of the Ministry of Labour, Invalids and Social Affairs (MOLISA)’ was analyzed, it was found that the number of people in the working age population of 15 to 60 years old (not taking disabled and people abroad into account) accounted for 55.64 million of which only 12.36 million (22.22 percent of the total) were appropriately trained at different levels and possess vocational certificates. The ratio of the structure of higher education to secondary (or college) and junior vocational education, calculated by authors, based on the updated bulletin of 2018 respectively was 1/0.93/0.35 (MOLISA, 2018). This is a warning towards the imbalanced structure of labour force training and contradicts the needs for a large number of qualified specialists and junior workers in industries. Moreover, the quality of education and training was also assessed in the ‘Skills toward Employment and Productivity (STEP) Employer Survey’ conducted by World Bank in the year 2011-12 at Vietnam. It was concluded that two-thirds of all international companies claim that neither the general education system nor the vocational education system was able to nurture the students with necessary skills needed at their subsequent workplace (Bodewig, 2014).

Conclusions

As discussed in the previous sections, it is the need of the hour to restructure the education and training system and improve the quality of training so as to meet the needs of economy. This can be achieved through the implementation of following measures: (1) Education and training sector have to change the vocational training structure; (2) Leveraging an effective form of ‘on-demand training’ that helps education and training organizations understand the needs of employers and (3) Entering into Memorandum of Understandings (MoU)
and collaborations by the entities such as public and private educational institutions, research institutes and manufacturing enterprises for the purpose of training since these kinds of MoUs are highly useful in ensuring a quality workforce that meets the industrial demand. Industrialization is an important part of Vietnam’s socio-economic development policy. For that reason, industrialization, modernization and the IZ development are considered as optimal solutions to achieve the development. IM has occurred under the impact of pull and push factors that contributed to the creation of diverse labour market so as to meet the large labour demand of the industries. In order to address issues related to industrial development and IM in developing countries, further in-depth research is required.

References


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ASSESSMENT OF CONVERGENCE PROCESSES OF SOCIAL-ECONOMIC SECURITY INDICATORS IN LATVIAN MUNICIPALITIES

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Abstract. The aim of the research is to assess convergence processes of a social-economic security indicator in Latvian municipalities and its components in the period 2011 – 2015, calculated as an integral indicator on the basis of primary statistical indicators. The relevance of the research is determined by the fact that social-economic security establishes not only the sustainable economic development of the country as a whole, but also the state of protection from internal and external threats. Municipalities, implementing their autonomous functions, are primary guarantors of social-economic security of the people. The convergence of social-economic security of municipalities implies the process of their convergence in time according to the values of the level of social-economic security.

Keywords: investment climate; investment potencial; investment security; sustainability


JEL Classifications: L26, M21, O11, R11

1. Introduction

The evolution of the concept of social-economic security should be considered, first of all, from the viewpoint of ideas about the security phenomenon at different stages in the formation of scientific and philosophical views. Therefore, when considering the category “security” in philosophical retrospect, we can observe the diversity of its content. However, there are also common features.

Security always has an application area, it is of a subject-object nature. If we consider security as an object, its subject at different stages in the formation of scientific ideas about this phenomenon at different times became a person, state, political system, welfare, or economic relations.

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Security is a multi-level concept. In a philosophical retrospect, it is considered at least at two levels: a micro-level or personal security and a macro-level or security of society, or a state (e.g., Masood et al., 2019; Moumen et al., 2019; Rezk et al., 2019; Fabus et al., 2019; Mikhaylov et al., 2018; Nikitina et al., 2018; Škuflić et al., 2018; Filipishyna et al., 2018; Kalyugina et al., 2018; Tvaronavičienė, 2019). Since the second half of the 19th century, personal security, security of society and the state have not been considered separately: they are interrelated and interdependent. If any objective or subjective reasons pose a threat at a macro level, they also pose a threat at a micro level. At the same time, underestimating the importance of security at a micro level can act as a catalyst for a failure of security at a macro level. There is a lot of attention to the economic security at micro level (Abdullah et al., 2019; Cristiano Freitas Gomes et al., 2019; Olayinka A. Abiodun et al., 2019; Veli Sibiya., & Tumo Kele, 2019; Schwarz, 2018; Energy Transformation towards Sustainability, 2019).

Security is always related to the satisfaction of needs. Satisfaction, first of all, of social-economic needs – the needs for economic and social benefits, is important for the subject of our research. Security is always related to the absence of threats. Threats are classified according to the system of micro- and macro-levels, and depend on the system of political and economic structure of the state. Security always implies protection, that is, some kinds of forms and conditions that protect the object from destructive interference. Security is considered as the state of harmony, tranquility, and balance of the interacting parties.

The development of the concept “social-economic security” mainly happened at macro- and micro-levels. Representatives of old economic schools almost never dealt with a meso-level. Over time, the economic and social components of the research subject are increasingly becoming interpenetrating concepts: changes in one, certainly lead to dynamics in the other. Therefore, it does not seem rational to consider economic and social security separately. Due to versatile and multidimensional features of the phenomenon, in the world there is no generally accepted definition of social-economic security, although it is possible to identify some features that provide a general picture of what this phenomenon means.

First, social-economic security is a complex and dynamic concept. This complexity appears, on the one hand, because of a lot of economic, social, and financial processes this concept includes. On the other hand, the complexity is determined by the globalization processes and fast rates of economic processes and phenomena at both national and global levels.

Second, social-economic security should be interpreted as:
- a significant factor of national security that provides resources and a dynamic balance for other components of this system;
- one of the indicators of national, regional, and global security that is the purpose of every person, community, national state, etc.;
- a priority task of governments, regional, and international organizations that strive to provide and guarantee global security of an individual;
- a state of a national economy understood as a source and foundation for elimination of poverty, starvation, social and economic inequality between both individuals and regions within one country.

Third, social-economic security means protection of vitally important interests of a society, country, and citizens, as well as national values and way of living from external and internal threats.

Fourth, social-economic security is a fundamental human right. It is the condition when risks and threats are kept under control in order to protect individuals and communities.

Fifth, social-economic security is a resource necessary for everyday life of individuals and communities in order to achieve their personal or collective aspirations.

Sixth, social-economic security is the result of interaction between external and internal factors that promote the
processes of production, distribution, and consumption of goods and services produced by a national economy. Seventh, government and non-government organizations play an important role in the achievement of social-economic security at national as well as regional and global levels.

Analyzing the definitions of social-economic security, we can state that the existing definitions do not include a level differentiation, although it is obvious that the content of the concept of social-economic security at macro, meso, and micro levels will be different. The authors of the research believe that it would be useful to introduce a level differentiation of the concept “social-economic security” on the basis of the fact that goals, objectives, and, most significantly, indices or factors of this indicator will be different for subjects at different levels.

Therefore, on the basis of the outcomes of the analysis, it is possible to provide the following definition: *social-economic security of municipal administrative areas is a complex category which is based on the ability of a municipal government to establish mechanisms for implementation of its autonomous functions and spheres of activity, to ensure social-economic security on the basis of a sustainable growth of its indicators, as well as to contribute to a maximum satisfaction of the infrastructure needs of the residents and entrepreneurs on its territory* (Lavrinenko et al. 2016; Smirnovs et al. 2018; Ohotina et al. 2018a).

Therefore, it is particularly important to establish an adequate model of social-economic security which allows describing the state of economy at macro and meso levels, carrying out analysis and forecast, and as a result identifying the best possible priorities for the strategy of social-economic security in Latvian municipalities. State administration bodies also need the established model of social-economic security in order to support the decision-making process in the sphere of macroeconomic policy and development of measures for regulating market economy.

The methodological basis of the research are works of both western reaserchers and researchers from different countries in Central and Eastern Europe (Rehm and Schlesinger 2010; Hacker 2012; Buzan 2007; Tvaronavičienė 2018a, 2018b 2019, Tvaronavičienė et al. 2018; Senchagov 2002; Tambovcev 1995; Lavrinenko et al. 2016; Lavrinenko 2016 Ohotina et al. 2018b, Gagarina et al. 2019).

2. Design and the sample of the research

Social-economic security is a complex social-economic category; therefore, primary statistical indicators for the regions under study may be presented in the following way:

\[
X = \begin{bmatrix}
x_{11}, x_{12}, \ldots, x_{1n} \\
\cdots \\
x_{l1}, x_{l2}, \ldots, x_{ln} \\
\cdots \\
x_{m1}, x_{m2}, \ldots, x_{mn}
\end{bmatrix},
\]

where \( m \) is a number of regions, \( n \) is a number of indicators which characterise social-economic security (Kosiedovskis, Lavrinenko 2014; Lavrinenko 2015).

Taking into account various units for measuring primary indicators, it is necessary to unify the data. The authors carry out the unification on the basis of the linear scaling principle, as a result of which the area of possible values is determined by the interval \([0;10]\) by formula (Lavrinenko, Lavrinoviča 2013):

\[
x_{ij} = \frac{x_{ij} - x_{\min j}}{x_{\max j} - x_{\min j}} \cdot 10
\]
- by indicators-stimulants and

\[ x'_{ij} \cdot X_{\text{max}} - x_{ij} \cdot X_{\text{min}} \]

- by indicators-destimulants, where \( x'_{ij} \) — a unified value of the indicator “j” for a municipality “i”, \( X_{\text{min}} \) and \( X_{\text{max}} \) — the lowest (the worst) and the biggest (the best) value of the primary indicator in the period under study.

The structure of the overall indicator of social-economic security consists of 10 components which include the following primary statistical indices: general economic component \( F1 \) - total income of a municipality, total expense of a municipality, a number of economically active commercial communities per 1,000 inhabitants, a number of economically active self-employed individuals per 1,000 inhabitants, a number of economically active farm households per 1,000 inhabitants; investment component \( F2 \) – the EU funding per 1,000 inhabitants, a total sum of direct foreign investment; industrial component \( F3 \) - income tax (a municipality’s share), a number of income tax payers at a place of a company registration, a collected sum of income tax per 1 inhabitant at a place of a company registered address; educational component \( F4 \) - municipality’s expense on education, a number of registered companies, a number of liquidated companies; infrastructure component \( F5 \) - a municipality’s expense on public maintenance of a territory, immovable property tax, general density of motorways; ecological component \( F6 \) - a municipality’s expense on environment protection; cultural and recreational component \( F7 \) - a municipality’s expense on leisure, culture, and religion, revenue from selling tickets, tax on gambling; employment component \( F8 \) - a level of unemployment, a number of employers, a number of income tax payers at an employee’s declared address, a collected sum of income tax per 1 inhabitant at an employee’s declared address, a share of long-term unemployed persons of the total number of unemployed persons; law enforcement \( F9 \) - a municipality’s expense on ensuring public order, a number of crimes per 1,000 inhabitants, a number of serious crimes per 1,000 inhabitants; insuring of social protection and healthcare \( F10 \) - a municipality’s expense on the social sphere, a number of households receiving housing benefits, a number of benefits on guaranteed level of income, a number of persons with a low income status (% out of total number of inhabitants), a share of inhabitants who receive social services (% out of total number of inhabitants), a municipality’s expense on medicine (Smirnovs et al. 2018).

Calculation of the indicator of social-economic security was carried out on the basis of the method of sums of the factors that characterise a municipality’s spheres of activity which in turn were calculated as a sum of unified statistical indicators included in every sphere:

\[ X_i = \sum_{j=1}^{5} F1_j + \sum_{j=1}^{3} F2_j + \ldots + \sum_{j=1}^{6} F10_j \]  

where \( i = 1,119 \); \( X_i \) — a complex assessment of social-economic security for a municipality \( i \); \( F_{ij} \) — the value of a factor of social-economic security characterizing every sphere of activity of a municipality (a component), where these factors are calculated as a sum of statistical indicators that characterize them (Smirnovs et al. 2018).

Convergence of municipalities’ social-economic security imples the process of their converging according to the values of the level of social-economic security. Two concepts of convergence, interrelated but determining different effects, are mainly used: \( \beta \)-convergence (Baumol, 1986; Barro R.J., Sala-i-Martin X. 1992, p. 223 – 251) and \( \sigma \)-convergence (Sala-i-Martin 1996a, p.1325-1352; Sala-i-Martin 1996b, p.1019–1036; Islam 2003).
According to β-convergence, regions with low absolute values of the indicator under study at the initial period of time are characterised by on average a higher growth rate of this indicator during the process of integration. In order to evaluate β-convergence, growth-initial level regressions are used:

\[ y_i = a + \beta \ln(x_{i,t-T}) + \epsilon, \]  

(5)

where \( x_{i,t-T} \) – an indicator at the point of time preceding the current point of time \( t \) at \( T \) periods (as a rule, the initial period of integration), \( \beta \) – a coefficient to be evaluated, \( y_i \) – average growth rates in \( i \)-region over \( T \) periods, calculated as \( \ln(y_{it})/\ln(y_{i,t-T}) \), \( \epsilon \) - a random deviation. The value of the \( \beta \) coefficient is an indicator of convergence. If \( \beta<0 \), a high level of the indicator at the initial time period correlate with relatively lower growth rates (Čizo, et al., 2018).

Unlike β-convergence, σ-convergence presupposes the decrease with time in a standard deviation of the indicator’s value which levels the discrepancy between regions. Another indicator that is often used when there is a trend in time series is the relation of a standard deviation to average (variation coefficient). β-convergence(i.e. a quicker growth of indicators in the states with lower values of this indicator at the initial period) does not necessarily lead to the decrease in inequality on the indicator under study, namely too-convergence (Barro, Sala-i-Martin 1991, 1992). It happens when a group of regions with the initially low absolute values of the indicator constantly changes places with the states with the initially higher absolute values of the indicator, although the overall level of gap between these regions is permanent (Sala-i-Martin, 1996a, Sala-i-Martin 1996b, Barro., Sala-I-Martin 1991, Barro, Sala-I-Martin, 1995).

The authors used the relative indicators of the variation: the coefficient of range \((K_R)\) and the coefficient of variation \((V_\sigma)\). Their calculation is as follows:

\[ K_R = \frac{X_{\text{max}} - X_{\text{min}}}{\bar{x}}, \]  

(6)

\[ (V_\sigma) = \frac{\sigma}{\bar{x}}, \]  

(7)

where \( \sigma \) - a standard deviation, \( \bar{x} \) - an average value, \( X_{\text{max}} \) and \( X_{\text{min}} \) – the largest and smallest value of the characteristic in the selection (Čizo et al. 2018).

The increase of the coefficient of range and coefficient of variation directly signifies the enhancement of the characteristic in the population under study. Therefore, analysing dynamics of the coefficient of range, coefficient of variation, and the sign of the coefficient \( \beta \) in the growth-initial level regressions, it is possible to provide a qualitative characteristic of the process of growth of the existing differences in the sphere of social-economic security in Latvia’s municipalities in the period 2011 - 2015.

3. Research results

In order to carry out a dynamic analysis of social-economic security of administrative areas in Latvia’s municipalities, the results for 2011, which are shown on Figure 1 are taken as basic indicators. They are provisionally divided into quintiles. Territories with the best indicators of social-economic security are coloured white (quintile 5), territories with the worst indicators – black (quintile 1) (Smirnovs et al. 2018).
In order to carry out a dynamic analysis of social-economic security of administrative areas in Latvia’s municipalities, the results for 2015, which are shown on Figure 3 are taken as comparison indicators.

**Figure 1.** Social-economic security of Latvia’s municipal territories according to the data for 2011

*Source: Smirnovs, Lavrinenko, Tumalavičius 2018*

**Figure 2.** Social-economic security of Latvia’s municipal territories according to the data for 2015

*Source: Smirnovs, Lavrinenko, Tumalavičius 2018*
Summarizing the outcomes of the research carried out by A. Smirnovs (Smirnovs et al. 2018), it can be concluded that the level of social-economic security improved in the period 2011 - 2015, both in relation to their own indicators, and in relation to other municipalities’ indicators in 16% of Latvian municipalities. The improvement of their own indicator of social-economic security and at the same time its deterioration in relation to other Latvian municipalities is observed in 15% of municipalities. The deterioration in relation to their own indicators while being ahead of other municipalities is observed in 36% of the total number of municipalities. The deterioration of their own indicators while increasingly lagging behind other municipalities is observed in 33% of municipalities (Smirnovs et al. 2018). However, despite the identified trends, the general trend in the dynamics of imbalances in social-economic security in Latvian municipalities during the period under study remains unclear. Using Barro regressions, coefficients of range and variations of indicators, it is possible to identify what processes of social-economic security and its components are happening in dynamics: convergence or divergence.

The values of the coefficients of variation of municipalities’ social-economic security and its components from 2011 to 2015, which measure the range and show the dynamics of inequality are determined. If there is dispersion, the coefficient of variation or other statistical indicators of inequality decrease. It indicates the presence of convergence. Otherwise the indicators differ over time.

<table>
<thead>
<tr>
<th>Table 1. Values of coefficients of variation of social-economic security indicators and its components in 2011 and 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Social-economic security (%)</td>
</tr>
<tr>
<td>General economic F1 (%)</td>
</tr>
<tr>
<td>Investment F2 (%)</td>
</tr>
<tr>
<td>Industrial F3 (%)</td>
</tr>
<tr>
<td>Educational F4 (%)</td>
</tr>
<tr>
<td>Infrastructure F5 (%)</td>
</tr>
<tr>
<td>Ecological F6 (%)</td>
</tr>
<tr>
<td>Cultural and recreational F7 (%)</td>
</tr>
<tr>
<td>Employment F8 (%)</td>
</tr>
<tr>
<td>Law enforcement F9 (%)</td>
</tr>
<tr>
<td>Provision of social protection and healthcare F10 (%)</td>
</tr>
</tbody>
</table>

Source: Developed by the authors

The authors determined σ-convergence of the following indicators in Latvian municipalities in the period 2011 - 2015: the infrastructure component F5 – coefficient of variation decreased by 28%, coefficient of range by 31%; the ecological component F6 – coefficient of variation decreased by 7%, coefficient of range by 21%. It is too early yet to estimate σ-convergence according to the employment component F8. Therefore, in Latvian municipalities for 5 years there is divergence in most indicators, which negatively affects the dynamics of the overall indicator of socio-economic security: the coefficient of variation increased by 13%, the coefficient of range by 14% (Table 1).
When investigating β-convergence, it was found that the investment component F2, the production component F3, the infrastructure component F5, the ecological component F6, the cultural and recreational component F7, and the law enforcement component F9 have the coefficient β<0. Other components have either β>0 or p-value of the model is more than 0.05 (Table 2).

<table>
<thead>
<tr>
<th>Component</th>
<th>β</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social-economic security (%)</td>
<td>-0.161</td>
<td>0.166</td>
</tr>
<tr>
<td>General economic F1 (%)</td>
<td>-0.183</td>
<td>0.051</td>
</tr>
<tr>
<td>Investment F2 (%)</td>
<td>-0.493</td>
<td>0.005</td>
</tr>
<tr>
<td>Industrial F3 (%)</td>
<td>-0.201</td>
<td>0.000</td>
</tr>
<tr>
<td>Educational F4 (%)</td>
<td>0.007</td>
<td>0.909</td>
</tr>
<tr>
<td>Infrastructure F5 (%)</td>
<td>-0.324</td>
<td>0.000</td>
</tr>
<tr>
<td>Ecological F6 (%)</td>
<td>-0.194</td>
<td>0.012</td>
</tr>
<tr>
<td>Cultural and recreational F7 (%)</td>
<td>-0.329</td>
<td>0.000</td>
</tr>
<tr>
<td>Employment F8 (%)</td>
<td>-0.012</td>
<td>0.619</td>
</tr>
<tr>
<td>Law enforcement F9 (%)</td>
<td>-0.366</td>
<td>0.001</td>
</tr>
<tr>
<td>Provision of social protection and healthcare F10 (%)</td>
<td>-0.117</td>
<td>0.173</td>
</tr>
</tbody>
</table>

Source: Developed by the authors

There were several situations determined: β – convergence and σ- convergence; β – convergence and σ- divergence; β – divergence and σ- convergence (Table 3). The first situation “β – convergence and σ- convergence” explains that a quicker growth of indicators occurs in the regions with lower values of these indicators at the initial period of time, which with time results in the decrease in the coefficient of variation and coefficient of range of indicators in a specific group of regions. The second situation “β – convergence and σ- divergence” is possible when a group of regions with initially low absolute values of the indicator constantly changes places with regions with initially higher absolute values of the indicator, although the general level of gap between these regions is permanent. The third situation “β – divergence and σ- divergence” is possible if the condition of faster growth of indicators in regions with lower values of these indicators at the initial period of time is not met, which cannot with time lead to the decrease in the coefficient of variation and the coefficient of range of indicators in a certain group of regions. Therefore, β – convergence is based on the Solow model and provides the answer to the question whether low-level regions will ever be able to catch up with high-level regions. The interrelation of these concepts is that β – convergence follows from σ- convergence, but there is no opposite consequence (Smirnovs et al. 2018).

<table>
<thead>
<tr>
<th>Component</th>
<th>β - convergence</th>
<th>σ- convergence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social-economic security (%)</td>
<td>no convergence</td>
<td>divergence</td>
</tr>
<tr>
<td>General economic F1 (%)</td>
<td>no convergence</td>
<td>divergence</td>
</tr>
<tr>
<td>Investment F2 (%)</td>
<td>convergence</td>
<td>divergence</td>
</tr>
<tr>
<td>Industrial F3 (%)</td>
<td>convergence</td>
<td>divergence</td>
</tr>
<tr>
<td>Educational F4 (%)</td>
<td>no convergence</td>
<td>divergence</td>
</tr>
<tr>
<td>Infrastructure F5 (%)</td>
<td>convergence</td>
<td>convergence</td>
</tr>
<tr>
<td>Ecological F6 (%)</td>
<td>convergence</td>
<td>convergence</td>
</tr>
<tr>
<td>Cultural and recreational F7 (%)</td>
<td>convergence</td>
<td>divergence</td>
</tr>
<tr>
<td>Employment F8 (%)</td>
<td>no convergence</td>
<td>divergence</td>
</tr>
<tr>
<td>Law enforcement F9 (%)</td>
<td>convergence</td>
<td>divergence</td>
</tr>
<tr>
<td>Provision of social protection and healthcare F10 (%)</td>
<td>no convergence</td>
<td>divergence</td>
</tr>
</tbody>
</table>

Source: Developed by the authors
Therefore, it has been found that there are growing disparities of social-economic security in Latvian municipalities in the period 2011 – 2015. The values of the coefficients $\beta$, $\sigma$, $K_R$ also characterize the growing disparities in the following components: general economic (F1), educational (F4), employment (F8), and provision of social protection and healthcare (F10).

Regarding the investment (F2), industrial (F3), cultural and recreational (F7), and law enforcement (F9) components, the level of disparities is not changing in a situation where a group of municipalities with initially low absolute values of the indicator is constantly changing places with municipalities with initially higher absolute values of the indicator.

The fall in disparities is determined in the infrastructure (F5), and environmental (F6) components, i.e. a faster growth of indicators occurs in municipalities with lower values of these indicators in the initial period of time, which leads with time to the decrease in the coefficient of variation and the coefficient of range of indicators in a certain group of regions.

**Conclusions**

In the period from 2011 to 2015 in Latvia at the municipal level the disparities of the generalized indicator of socio-economic security increase, which is confirmed by the determined $\beta$ - divergence and $\sigma$-divergence. The biggest disparities have been determined in general economic (F1), educational (F4), employment (F8), and provision of social protection and healthcare (F10) components. Perhaps, the key factor of the growing disparities is the decrease in the number of population in provincial municipalities because of the emigration of young people, high death and low birth rates, which in turn leads to the reduction in social and educational facilities: hospitals, educational institutions, etc. The decrease in disparities has been determined in infrastructure (F5) and ecological (F6) components. The convergence of these components might be explained by the use of the EU funds for the improvement of infrastructure and ecology, as well as by the fall in industrial activities, which also positively affects the ecology. However, this issue requires a more thorough and detailed further investigation.

**References**


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Abstract. The prime objective of the current study is to investigate the total sovereign debt on the economic growth of Thailand. Since domestic debt is considered to be an economic growth stimulus particularly during the period of recession, therefore, its instruments are intended to analyze in this research. In a country, the lack of funds may negatively influence economic growth, therefore, most countries like to use external debt to finance its expenditures, such as Thailand. This situation can be improved by focusing on these countries developmental research. In Thailand, the information scarcity regarding domestic debt acts as a policy constraint while designing an effective domestic debt mobilization policy. Thus, the present study predominantly aims to investigate the domestic debt effects on Thailand economic growth. The study has examined the domestic debt effects on the economic growth, during 1998-2018. The variables used in this study are extracted from the previous literature and the theoretical framework used in this study. The key variables analyzed are Treasury bills, Government securities, and Investment issues, not forgetting the loans mainly housing loans fund, market loans of Thailand. The study has used the Johansen and Juselius co-integration approach to examine the long run relationship while ECM approach was used to see the speed of adjustment in the short run. Furthermore, we have conducted the Lagrange Multiplier test to all variables to check the presence of autocorrelation. The results show that there is no autocorrelation in the variables. For the instrument of Government securities, we have found that all the variables which are financial sector, social security institutions, insurance companies, and financial sector show a statistically significant result in long run analysis. On the other hand, short run analysis based on ECM model shows that social security institution, insurance companies, financial sector and foreign holders turn to be significant while public sector show insignificant results. The result for ECM also shows that the model is well adjusted in the short run.

Keywords: Total debt; investment; Economic growth; Thailand


JEL Classifications: 01, I1. I2, I3

1. Background

Achieving of sustainable development goals inevitable depends on economic growth potential (Baltgailis, 2019). Developing countries, as Thailand, as a rule encounters a problem of lack of capital resources. However, it is almost impossible to overcome this problem as capital resources are limited, and the problem is more severe shortage during economic recession. Therefore, the government should find alternatives or solutions to ensure that barriers or limitations in capital resources do not hinder economic activities for the development and welfare of the people in the country (Sauvé, Bernard, & Sloan, 2016). This is because sources of capital or funds are a very important requirement for carrying out planned economic activities.
Just as individual needs, the needs of the country as a whole increase continuously. The increase in the public needs is matched by the desire of the government to increase the income and welfare of the people in the country. Social welfare does not depend on any single variable or indicator, but on several indicators, some are economic in nature while others are social in nature. The growth of the public sector means an increase in public expenditures. The increase in public expenditures will not only distort the structure of the current income sources but will also force the state to implement additional methods to increase income (Simon, 2019; Sasongko et al., 2019; Finogentova et al. 2018; Vandina et al., 2018; Nikitina et al., 2018; Rustiadi, Ahmad, 2019).

It is well known that taxation, increasing the money supply, and incurring domestic debt are methods of financing public expenditures. Both methods have their shortcomings: increase in tax burden leads to shadow economy (e.g. Osipov et al.; Newman et al., 2018; Markina et al., 2018), and debt puts load on future generations. Governments do not finance all its expenditures from tax revenue. The other method of finance is borrowing from the public. When government spending exceeds tax revenues, the difference can be financed by selling government bonds and bills. Usually, governments prefer to engage in debt to finance public expenditures rather than increase taxes. The market from where governments do the borrowings is generally from within the country or the domestic market and the instrument is commonly known as domestic debt.

Domestic debt is classified into national debt which comprises of those liabilities owed by government and citizens. For example, Thailand’s domestic debt includes Treasury bills, Government Securities, Investment Issues and other loans. Domestic debt is different from sovereign debt. National government is responsible for the issuance of government bond which is often labeled in terms of domestic currency of a country. However, sovereign bonds are the ones which national government issue in foreign currencies. Government domestic debt can also be defined as the money owed either by federal, central, local or municipal government (Irwin, 2015). It is a taxpayers’ indirect debt which can be further classified into internal debt payable to the lenders of the home country. Moreover, the public debt are those obligations having more than a year time for repayment. Public debt also comprises of external and domestic debt. The domestic debt involves those loans that are granted to the central government by financial institutions or domestic banks. On the other hand, public external debt is generally classified in terms of creditor, borrower and by its level of maturity (Borio, 2014). However, the amount of total debt that is received throughout the decades must be considered separately from the federal budget deficit, where federal budget deficit is the excessive spending out of the federal government’s income during a fiscal year.

The relationship between domestic debt and economic growth is somewhat complicated as domestic debt could be either good or bad for economic growth. The effect of domestic debt on growth depends on how the government utilizes the money borrowed. For developing countries such as the East Asian countries which are usually lacking in capital, besides external debt, domestic debt also plays a key role in the promoting economic development. Over the past few years, countries while adopting aggressive policies or while involving in net borrowing look out for domestic sources to substitute public external debt with domestically issued debt. A few countries indulge in domestic fiscal liabilities to sterilize the extensive aid inflows. If a country’s access to the resources improve with the external borrowing then domestic borrowing may allow the transferring of resources, from public to the private sector.

In the normal course of development, there are many problems faced by a developing country. For instance, in Thailand one such problem is a small capital stock. Capital as a source of development financing could come from domestic sources or from outside the country (Evans, 2018). Capital resources from abroad, in the form of external debt is very risky. Not only do they burden the state annual budget revenue and expenditure but are usually accompanied by interference of the donor countries in the internal affairs of the recipient countries. This made many countries sceptical of securing capital from abroad. In other words, external capital is the last alternative for these countries. External loans function as a complement to domestic funds in the case that domestic funds are insufficient to finance development activities in Thailand. However, depending too much on external loans as the main source of development financing creates a dependence on the foreign countries.
or donors, giving rise to an increasingly heavy debt burden (Loxley, 2019). In Thailand’s case, it results in the foreign exchange and economic crises in the middle of 1997.

One of the steps used to strengthen the foundation for the development and economic growth Thailand is to reduce the dependence on foreign capital flows (especially short-term capital flows) and foreign loans which have become one of the causes of the economic downturns in Thailand. Consequently, the mobilization of domestic funds is a very crucial issue to reduce the country’s dependence on foreign capital and foreign loans. Banking institutions play important role in collecting and mobilizing savings (Jacob & Innocent, 2019). Households set aside a portion of their income that is not consumed as savings. These savings will be collected by the banks as third-party funds (TPF). Savings play important role in economic development. The effect of government policies is positive as seen from the rapid increase in deposits and saving deposits even though some problems still plague our economic stability in general. As a result of the deregulation policy in the banking industry, the economy becoming more global because of the export oriented economy, the increasing role of foreign capital (FDI), more sophisticated and open communication system, the economy is more vulnerable to the workings of the global financial markets (Karwowski & Stockhammer, 2017).

In order to avoid ever-increasing public debts, many Asian economies are required to increase their efforts towards fiscal consolidation. In particular, those adjustments which shrink the fiscal deficits may result in stronger economic growth, whereas, adjustments which are carried out by reducing expenditures tend to be more sustainable and successful as compared to the ones which are led by increase in taxes. Sustainable debt refers to the level of debt that completely fulfils the future as well as current debt service obligations of a debtor country, without rescheduling or employing further debt, and also avoids the accumulation of outstanding payments, while achieving an acceptable economic growth level (Nissanke, 2019). In order to assess the nature of national debt i.e. whether it is small or large, it can be compared to the national economy’s product or income, since further borrowing or taxation are the principal payments and ultimate sources of interest. The sovereign debt in Thailand has increased significantly (see figure 1).

![Figure 1: Total debt of Thailand (2004-2017)](image)

Several developing economies, such as Thailand, could not restrict their public domestic debt growth. It is important to keep public domestic debt at low levels to ensure the availability of sufficient revenues for financing other development expenditures by government. Besides other factors, reduction in external donor support, sluggish real revenue receipts and unending expenditure pressures have given rise to high domestic
debt particularly in developing countries during 1990’s (Hardt, 2019). Thus, different domestic debt components or domestic debt size can be analyzed to assess the domestic debt evolution. Stock of government debt is generally estimated in proportion to national output. The three theoretical reasons revealed for the government domestic debts are: 1) for financing budget deficit, 2) for monetary policy implementation (i.e. treasury bills buying and selling in open market operations); and 3) for establishing financial instruments (for financial markets deepening).

This study aims to use the most recent data to analyse the effect of domestic debt on economic growth in Thailand. We can see that in the recent years, the government has presented budgets that encourage the use of Government securities, Treasury bills and Investment Issues. (Pereira & Wemans, 2015). While facing external debt issues, it is important to squeeze domestic demand to create current account surplus in the balance of payments. Relaxing financial markets may inflate the interest rate which could create problems to finance existing debt and making further government borrowing to finance the previous debt would result in stacking up of domestic debts. Moreover, the severely indebted economies with huge external debts are mostly encountered with solvency problem, restricting them from further borrowing from external sources and switch to the domestic borrowing.

2. Theoretical Frameworks

The Neoclassical view states that there exists a negative relationship among economic growth and public debt. Therefore, the growth models together with issuing public agent’s debts for financing capital or consumption goods create a negative association among economic growth and public debt. The government debt through causing its effect on the interest rates indirectly impact economic growth in the long run. According to a traditional view, increasing government debt will increase the burden on the economy. This increase in government debt would make consumer wealthier in the short run, resulting in higher consumer spending and this increased in consumer spending would gave rise to an increase in goods and services demand, which would in turn increase employment and output in the short run (Chodorow-Reich, 2019). This condition would increase private savings and decrease government dissaving, since marginal propensity to save is comparatively lower than marginal propensity to consume. This would give rise to an increase in real interest rate in the economy, which will encourage the inflow of capital from outside the country. Whereas, the higher rate of interest will not encourage investors to invest in the long run, resulting in crowding out effect on private investment. Thus, there will be smaller stock of capital available because of lower savings. In addition, there will be greater foreign debt from abroad. Thus, greater aggregate demand will increase prices that will automatically adjust in the long run and get back to natural output (Auclert & Rognlie, 2018). However, lower investment will bring lower output and lower steady state capital stock, with smaller effect on total output as a whole, followed by low consumption and economic welfare, which also referred as public debt burden, since each generation shifts burden to the later one, with a smaller stock of capital leaving behind (Saungweme & Odhiambo, 2019; Warjiyo, Juhro, & Warjiyo, 2019).

The Ricardian theory considers government debt and future taxes as equivalent (Tran, 2019). Considering consumer as forward-looking and rational make current deficit and discounted sum of future taxes to be equal. It creates a shift between deficits and taxes and create no aggregate wealth effects, resulting in increased government debt keeping consumption unchanged. Thus, the total savings by rational consumers will remain the same, who currently face deficits to save for the future tax increase. Increase in private savings would be equivalent to a reduction in government dissaving. According to the Ricardian’s unchanged total savings view, the interest rates and investment will remain unaffected, whereas, the effect will be on the national income. According to Johnson (2018), the domestic debt is incurred as a result of tax liability postponement from the present to the future generation. Such situations of shifting from current to future system of taxation involves the transferring of tax-burden from present to the future generation. National debt acts as a future generation’s burden which arises in the form of reduction in the income flow from lower private capital stock. Thus, it is the operative inter-generational transfers which cause a movement of current taxation to the future time involving no debt issue on future generations.
In developing economies, the fiscal sustainability and debt dynamics are becoming the huge concerns of policy makers. Developing economies are required to be dependent upon domestic debt due to difficulty obtaining external debts for accomplishing their development projects. Domestic debt may have a crowding effect on the domestic private investment, with long-run unsustainability. However, the domestic debt sustainability can be estimated by calculating the domestic debt to GDP ratio. Fiscal sustainability can be measured when the public debt to GDP ratio is found to be stationary (Hoai, Thanh, & Tung, 2015), which suggests the non-stationary public debt to GDP ratio as unsustainable. The Section 46 (b) for Fiscal Responsibility Act is the act regarding debt management framework, thus, achieving sustainable public debt to GDP ratio must be ensured by the Government. (Isibor, Babajide, & Osuma, 2018) suggested that the government borrowing from the internal sources is the main government expenditure financing source after the fall in internal oil prices. In another study, Shehu reported that the weak fiscal imbalances started in 1980s and continued till 1990s, with a rapid increase in unsustainable public debt. This is due to the increasing debt service cost effects which deal with larger share of government spending during chronic fiscal imbalances. Public debt unsustainability impel Central Bank to take inflationary action for monetizing debt. According to Hoai et al. (2015), when public debt to GDP ratio is stationary, fiscal sustainability will be achieved. However, practicing fiscal policy may be susceptible to structural breaks, resulting in biased tests of public debt sustainability which leads to sustainability rejection. Mencinger, Verbic, and Aristovnik (2015) found these analyses to be more relevant, since there is increased fiscal pressure faced by the governments, with rising public debt to GDP ratios during economic and financial crisis, which are likely to be at higher level during medium term. The interest rates in the long run can also be indicated in a non-linear form. In addition, when the government operations are substantial in size, interest rates will increase in the long run, resulting in the increase in marginal productivity.

There are various means through which economic growth can be affected by public debt. Removing deadweight debt increase the saving incentives for the households (the Pigou-effect), which enables the reduction income taxation at later stage, due to the improvement in saving interest payments, and enterprise and work incentives (Owusu-Nantwi & Erickson, 2016). Saungweme and Odhiambo (2019) suggested that the national debt’s gross burden can be partially or completely offset when government expenditure is financed through debt, to contribute to the future generation’s real income, e.g. productive public capital formation. In order to cover the impact of public debt, the growth model can be extended with a non-linear impact of public capital on economic growth (Zhang & Sun, 2019). Thus, assuming government debt to be partially used for financing productive public capital, therefore, positive debt effects can be witnessed up to a certain level, after that level negative effects will occur. Mencinger et al. (2015) also suggested that there is scarce empirical evidence available regarding growth and debt relationship, which primarily emphasizes upon external debt’s role in developing economies.

Mencinger et al. (2015) attempted to assess per capita GDP growth and gross government debt relationship for developed economies. The study used the case of 24 developed economies for the years 1970-2002 and found no statistical significance between the two. Furthermore, Égert (2015), also analyzed GDP growth rate in the long-run and gross central government’s development using a case of 20 developed economies during 1790-2009. The study reported i) a weak relationship among long-term growth and government debt for per GDP ratio which is below 90% of threshold level, and ii) above 90%, there is a 1% fall in median growth rate and more on average.

In a study by Kumarasinghe and Purankumbura (2018), it is analyzed that if domestic borrowing pose crowding out effect on the private sector borrowing during a specified period of time, and found small and short term domestic debt markets with limited investor base. Private sector lending also crowds out significantly through domestic debt utilization. The study suggested that public investment is beneficial to the economy particularly for private sector development. The huge public investment has spill-over effects that require time to provide benefits to the private sector, e.g. infrastructure projects. It is due to the fact that establishing world class communication and transport systems decrease business cost and yield profits. Thus, scarce resources hinder public investment to compete private sector. It is stated that expanding investor base in government securities and robust economic performance significantly increase the domestic debt’s maturity profile. The study also explained that the crowding-out generally occurs when there is extensive government borrowing from domestic
market, and the increased demand for investible funds would result in the shortage of funds pushing interest rates upward, leading to a decline in private borrowing which subsequently limit the private investment. However, there are other crowding-out channels. Saungweme and Odhiambo (2019) attempted to analyze the levels of domestic debt in 40 emerging markets and Sub-Saharan African economies, during 1975-2004, and reported significant positive impact of moderate marketable domestic debt (% of GDP) on economic growth.

Baita and Daud (2019) have identified need for financing government expenditures as the reason for a fast-domestic debt increase. However, various government efforts for rationalizing public spending have not been successful, resulting in a continuous rise in the size of domestic debt. Ascending public debt volume is essential for a healthy and strong financial structure. Thus, every government in a market-oriented economy must plan an increase in public debt i.e. no government has a plan of increasing debt in the long-run. It must be noted that a borrowing country automatically gets involved in debt burden is a false view. Chepkemoi and Finance (2014) clarified this false view by stating that indebtedness occurs when a country finds it difficult to repay the debts, where key cost of borrowing is the repayment of interest and the principal amount. He further argued that borrowing arises as a result of increase in development projects by government having no additional amount for financing. Igbodika, Jessie, and Andabai (2016) attempted to investigate the origin of debt problems in Nigeria and found that the 1981 international oil prices collapse, and domestic lapses are partially responsible for the debt problems in Nigeria. Such debt problems may gradually shut down the credit facilities, leading to the obstruction of various projects. In addition, he also advocated the economic growth revival as the most durable and best decision solution for minimizing debt burden. However, factors which may create hindrance in growth achievement includes, external factors and inappropriate limitations arising from the use of domestic policies.

In another study, Cadenillas and Huamán-Aguilar (2016) provided logical reasoning that environment is distinguished by foreign investors’ presence (i.e. domestic investors purchasing internationally issued debt and foreign investors who purchase debt that are issued domestically) and open capital accounts. This situation arises when government decides not to absorb but spend, in that case it either issue domestic debt or print money, which implies that domestic debt can be increased by translating aid into debt. He also discussed the developing countries scenario, as the developing economies shift to the domestic debt market in case of difficulty to obtain aid flows or loans from external sources. The researcher also mentioned that issuance of long-term domestic currency debt should not be avoided due to its expensiveness as compared to other financing sources. In fact, various cases are also found in which market creation and insurance benefits that are related to safer debt issuing are worth the price. In addition, Saheed, Sani, and Idakwoji (2015) also explained that central bank while performing its debt management functions significantly plays its role in secondary and primary government securities market. The issuance of government securities is readily guaranteed by Central Bank and absorbs any volume of finance that is not subscribed by the public non-banks and banks in primary market. In case of zero subscriptions of non-central Bank, mandatory take-up ensures the issuance of full amount of treasury certificates, treasury bills and development stocks to the government that are needed for financing the government budget (Policy, 2017).

Central bank also offers secondary market to sell government securities to the public. Besides treasury bonds, all other instruments also possess upper bounds or statutory limits equal to the volume of federal borrowing. In addition, it has argued that the evolution of domestic debt can be analyzed through its size or through analyzing different components. However, the government debt stock is often measured in relation to its national output. Regardless of the small amount of domestic debt as compared to foreign debt, the payments of domestic interest rate significantly burden the budget. Domestic debt has a significant crowd-out effect on the economy’s level of private investment. Thus, it is concluded that government debt from internal sources continues to suffer by confidence crisis, since the market participants tend to exhibit unwillingness for longer maturities (Ardagna & Caselli, 2014).

According to Lai, Rethel, and Steiner (2017), the growing demand to finance private sector in the long-term reflects the market that is primarily driven by government debt securities. Financing requirements of corporate
sector has increased to 58% which are financed through sukuk market and debt securities, in comparison to a level of 33% in the last ten years. The financial system sustainability arises as a result of an occurrence of liquid debt securities. In order to enhance the process of price discovery, Thailand has started a mechanism for improving liquidity to ensure efficient market functioning. Modern and comprehensive delivery, settlement system and depository are equally important for facilitating the debt issuance, settlement and trading sukuk and debt securities in the market. In the presence of such structures and mechanisms, the Thailand sukuk and debt securities market is considered to be the largest market having those structures and mechanisms which Central bank implements. Furthermore, the sukuk market and debt securities in Thailand has becoming even more sophisticated and innovative for satisfying investors and issuer’s requirements and diverse risk-return profiles.

Those instruments having extended profiles include foreign and local market players. In 2005, Thailand explained that market liberalization is allowed to issue multilateral agencies and foreign corporation’s debt securities (Koo & Hong, 2014). It has been further expanded to the denominated issuances of foreign currency in 2007, which has attracted several multinational corporations, multilateral agencies and foreign corporations towards fund raising and investing to originate and issue outside Thailand, thereby strengthening inter-linkages of country’s financial market with the international markets and enhancing the market in Thailand. It has been stated that increasing interest in Sukuk and large debt issuance is spurred by the growth of Sukuk market and debt securities and becoming an integral part of the Thailand’s financial market.

Thailand being a pioneer of Sukuk market has also become the largest Sukuk issuer, having an outstanding Sukuk of 62% world’s sukuk. Thailand is the largest sukuk issuer having competitive and innovative structures. The financial access through financial market has remained unhindered. A financial guarantee insurer has been recently established by Bank of Negara Thailand to offer credit enhancement for the corporations, and for raising finances from sukuk and debt securities market. However, the aim of coordination and collaboration among regulatory agencies is to ensure market robustness and resilience against any shocks and to maintain stability. Sukuk market and domestic debt securities are the key aspects which evolve and continue to meet the investors and businesses changing requirements. The increased foreign and domestic participation contributes to the further market development and will strengthen the economic and financial inter-linkages along other parts of world (Khan, 2016).

3. Data

The present study has examined the domestic debt effects on the economic growth, during 1998-2018. Since domestic debt is considered to be an economic growth stimulator particularly during the period of recession, therefore, its instruments are intended to analyze in this research. The data of variable is gathered from the website of World Bank, international monetary fund and economic intelligent unit.

Estimation

The present study used Vector Autoregressive Model (Castro & Nevárez) approach to test the domestic debt variable using Rafindadi and Ozturk (2017) test, and multivariate co-integration test for analyzing the causal association among economic growth and domestic debt. However, other co-integration tests like Wooldridge (2016), and Issler, Notini, and Soares (2013) can also be used to test the causality but the Johansen Cointegration test has certain desirable properties, such as it treats all test variables as endogenous variables.

Since the data has non-stationary time series properties, therefore, in order to assess the co-integration relation between the variables the long-run association must be considered among different time-series. A given series is integrated of order d if a stationary time series can be obtained by differencing series for d times. After performing data stationary test, Johansen and Juselius (1990) and Johansen (1988) tests were employed to test long-run association between the variable and also involves co-integrating vector tests.

\[ Y_t = \sum Y_{t-1} + \sum Y_{t-2} + \sum Y_{t-3} + \sum Y_{t-4} + \cdots \cdots \cdots \sum Y_{t-k} + \varepsilon_t \cdots (1) \]
Here, $Y_t$ represents the stochastic variable’s $N \times 1$ vector, $\mathbf{\Pi}_1, \mathbf{\Pi}_2, \ldots, \mathbf{\Pi}_k$ represents $n \times n$ parameter, and $e_t$ shows random error term. If the $Y_t$ is stationary, we can write the above equation as follows: \[ \sum_{i=1}^{k} \Delta Y_{t-i} - \Pi Y_t = e_t \quad \text{... (2)} \]

Where, \[ \Pi = [1 - \mathbf{\Pi}_1 - \mathbf{\Pi}_2 - \cdots - \mathbf{\Pi}_I] \]

$I=1, 2, 3, \ldots k-1$

The long-run relationship can be captured among $\rho$ variables with the matrix $\Pi$ which can be broken down in matrix $A$ and $B$, e.g. $\pi = AB$, where $A$ represents vector error-correction parameter and $B$ represents co-integrating vector. Through this, the long-run relationship between GDP, government securities, other loans, and domestic debt can be tested using Equation 1 and 2.

This section involves the formulation of error-correction model. The co-integration tests are performed to investigate whether long-term association exists among the variables, however, it does not indicate the direction of this causation. ECM estimation enables to separate short term responses from the long-term association among economic variables and to discover the direction of long-term Granger causation. In a co-integrated system, the causality is established when the lagged ECT term and sum of lagged coefficients for variables are significant.

Cointegrated series represent the correction mechanism. According to Wooldridge (2016), the possibility of estimated regression to be spurious is ruled out if series are found to be co-integrated due to the occurrence of autocorrelation, endogeneity bias, and omitted variable bias. Since the series in our study are co-integrated, thus, the next step is to determine the causal direction between the variables which calls for the specification of various vector error correction models. Considering the short-run properties of series may offer useful insights for the policy makers. Thus, based on the co-integrating vector, the error-correction model (ECM) is stated as follows:

\[ \Delta \ln RGD_{t} = \alpha_1 + \sum_{a} \theta_1 (i) \Delta \ln TD + \sum_{b} \theta_1 (i) \Delta \ln GpvSec + \sum_{c} \rho_1 (i) \Delta \ln Inv + \sum_{d} \rho_1 (i) \Delta \ln RGD_{t-1} + \epsilon_{t} \quad \text{... (3)} \]

\[ \Delta \ln TD_{t} = \alpha_1 + \sum_{a} \theta_1 (i) \Delta \ln RGD + \sum_{b} \theta_1 (i) \Delta \ln GpvSec + \sum_{c} \rho_1 (i) \Delta \ln Inv + \sum_{d} \rho_1 (i) \Delta \ln RGD_{t-1} + \epsilon_{t} \quad \text{... (4)} \]

\[ \Delta \ln Inv_{t} = \alpha_1 + \sum_{a} \theta_1 (i) \Delta \ln TD + \sum_{b} \theta_1 (i) \Delta \ln GpvSec + \sum_{c} \rho_1 (i) \Delta \ln RGD + \sum_{d} \rho_1 (i) \Delta \ln RGD_{t-1} + \epsilon_{t} \quad \text{... (5)} \]

Where $\Delta$ is the first-difference operator, ECT is the error correction term coming from the long-run cointegrating relationship, i.e. residuals, and the terms $a, b, c, d$ is lag lengths. In this parsimonious ECM model, the lag lengths could be equal to zero for the variables that are not also dependent variables.

4. Results

The correlational analysis of the variables is shown in the table 1. The correlation value indicates that the all the variables used in the current study are highly correlated.
Table 1. Correlation

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>RGDP</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TD</td>
<td></td>
<td>-0.1830</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>GpvSec</td>
<td></td>
<td>0.6483</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>InvL</td>
<td></td>
<td>0.6188</td>
<td>0.8929</td>
<td>1</td>
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</tbody>
</table>

Table 2. Results from Unit Root Test

<table>
<thead>
<tr>
<th>Variable</th>
<th>Level</th>
<th>Constant</th>
<th>Constant and Trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>RGDP</td>
<td></td>
<td>-1.923419191[0] (0.2364)</td>
<td>-0.631812131[0] (0.2372)</td>
</tr>
<tr>
<td>TD</td>
<td></td>
<td>-1.531812131[0] (0.3451)</td>
<td>-0.723234412[0] (0.3723)</td>
</tr>
<tr>
<td>GpvSec</td>
<td></td>
<td>-1.739281211[0] (0.4721)</td>
<td>-0.823716211[0] (0.2364)</td>
</tr>
<tr>
<td>InvL</td>
<td></td>
<td>-1.723818011[0] (0.5237)</td>
<td>-2.0352515115[0] (0.8362)</td>
</tr>
</tbody>
</table>

Table 3. Lag Length Selection Criterion

<table>
<thead>
<tr>
<th>Lag</th>
<th>LogL.</th>
<th>LR</th>
<th>FPE</th>
<th>AIC</th>
<th>SC</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-730.929</td>
<td>NA</td>
<td>4.05e+12</td>
<td>46.058</td>
<td>46.332</td>
</tr>
<tr>
<td>1</td>
<td>-624.659</td>
<td>166.047*</td>
<td>5.24e+10*</td>
<td>41.667</td>
<td>43.590*</td>
</tr>
<tr>
<td>2</td>
<td>-585.566</td>
<td>46.418</td>
<td>5.58e+10</td>
<td>41.473*</td>
<td>45.046</td>
</tr>
</tbody>
</table>

Note: LR: sequence modified LR test statistics; FPE: final prediction error AIC: Akaike information criterion; SC: Schwarz information criterion HQ: Hannan-Quinn information criterion. * denote choice of lag
Cointegration is all about long run relationship, among at least two variables which are non-stationary. The test for cointegration requires that the variables be integrated of the same order. The Johansen test uses trace test and maximum eigenvalue test determine the number of cointegrating equation.

We have used the Johansen and Juselius co-integration approach to examine the long run relationship while ECM approach was used to see the speed of adjustment in the short run. Furthermore, we have conducted the Lagrange Multiplier test to all variables to check the presence of autocorrelation. The results show that there is no autocorrelation in the variables. For the instrument of Government securities, we have found that all the variables which are financial sector, social security institutions, insurance companies, and financial sector show a statistically significant result in long run analysis.

![Table 4 ECM analysis](image)

On the other hand, short run analysis based on ECM model shows that social security institution, insurance companies, financial sector and foreign holders turn to be significant while public sector show insignificant results. The result for ECM also shows that the model is well adjusted in the short run. For the instrument of GDP, we have found that the Treasury bills, Government securities and Investment issues have a statistically significant effect on economic growth. In ECM model, Treasury bills, government securities, and investment issues turn to be significant. The result for ECM also shows that the model is well adjusted in the short run.

**Conclusion**

This finding has successfully achieved its objective with the significant variable found to affects the economic growth. All instruments involved in this study exhibit statistically significant results and are in consistence with Saungweme and Odhiambo (2019) findings, which established that economic growth is driven by moderate levels of domestic debt. Furthermore, the present study also reported a linkage among economic growth and debt markets, since domestic debt markets promote financial depth and economic efficiency. Evidence showed an increased vibrancy of the capital market in Thailand in the period. The Lagrange Multiplier also support the argument, which expects that domestic debt may lead to economic growth and confirms that the policies which promotes domestic debt is important in exerting influence on economic growth.

**References**


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Open Access
DOES TRANSPORT INFRASTRUCTURE FOSTERS THE ECONOMIC GROWTH:
AN ASEAN PERSPECTIVE

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Abstract. The prime objective of the current study is to examine the influence of infrastructure of transportation on economic growth for various countries in ASEAN. This influence differs in terms of administrative status and quality of infrastructure across the counties. GDP has been used as an economic growth measure in terms of per worker along with various kinds of infrastructure of transportation for years 2002-2017. Therefore, a short model has been incorporated with capital stock of railways and roads. Two variables have been incorporated to differentiate roads with different covering and quality. In the next step, the administrative status of roads has been distinguished. The results have revealed difficulty in interpretation because of the problem of endogeneity and reverse causality. Therefore, the research model was modified by including the lag values of variables of infrastructure of transportation for getting robust estimates. The unit root test has been performed and first differences in model were used to obtain stationary time series. It was found that GRP per worker is greatly influenced by overall roads stock. This is because of the use of such roads for large traffic load. The regional growth of economy is greatly influenced by the light covering roads rather than national roads of similar quality/covering. The influence of local government’s quality was controlled on development of economy. The turnout of voters was used as proxy variable for the local government’s quality. It was found that the influence of infrastructure of transportation stock in the areas (where government is of better quality) has not much influence on GRP per worker. Different kinds of infrastructure of transportation have been shown by this research being the drivers of growth of economy in. The administrative status and quality of covering roads creates an influence on the growth of economy. Based on the findings of study, the following recommendations have been made. There is need to develop national roads to improve the economic performance. Further, there is need to improve the quality of countries. However, the influence of infrastructure transportation is high where the government has low quality and overall capital stock influence is high where the government is of good quality (Crescenzi, Cataldo, & Rodríguez, 2016). In future, researches can be conducted by focusing on the influences of other variables of infrastructure including electricity lines, supply of water and for long time periods. The future studies can work on investigating the network effect of transportation infrastructure in ASEAN.

Keywords: Transportation infrastructure; Economic growth; ASEAN


JEL Classifications: 01, R1, R4

1. Background

It has been revealed by a number of studies that improvement of general infrastructure and transportation infrastructure creates a positive influence on development of regions and economic growth (Lietuvnikė et al., 2018, Haseeb, Kot, Hussain, & Jermsittiprasert, 2019; Tvaronavičienė, 2018; Yunus et al., 2019). The influence of railways and road transportation has been analyzed on ASEAN's economic growth in this research. Therefore, it is linked with liberalization of trade. A key role is played by the infrastructure of transportation in this framework. It is not possible to achieve economic growth from trade liberalization without developing
the infrastructure of transportation. Most of the services in transportation are carried out by railway and road systems in ASEAN (Ismail & Mahyideen, 2015; Fernando, 2019). In 2010, the transport of 14% goods was carried out by railways and 74% by roads.

The findings of this study can give important insights and implications regarding the development policies for infrastructure of transportation. In EU, the country lies in the centre of transportation infrastructure. There is need for developments in the region, as it is in the way to implement “Intermodal transport strategy in ASEAN 2020”. The findings of the study will be helpful for the strategy actualization. The study is not specified to ASEAN. Rather, it determines the influence of various types of infrastructure of transportation along with estimation of influence of paved roads having different covering quality (Khandker & Samad, 2018). Further, the research determines the influence of roads (county and national) with various geographical an administrative status on the development of economy in ASEAN. The road infrastructure in developing ASEAN countries is fairly well developed as evident from the figure 1 that the ranking of top growing ASEAN economies is higher than other except Brunei Darussalam.

<table>
<thead>
<tr>
<th>Country</th>
<th>Rank</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Singapore</td>
<td>2</td>
<td>6.5</td>
</tr>
<tr>
<td>2  Malaysia</td>
<td>11</td>
<td>5.7</td>
</tr>
<tr>
<td>3  Indonesia</td>
<td>36</td>
<td>4.5</td>
</tr>
<tr>
<td>4  Thailand</td>
<td>37</td>
<td>4.5</td>
</tr>
<tr>
<td>5  Vietnam</td>
<td>63</td>
<td>3.8</td>
</tr>
<tr>
<td>6  Brunei Darussalam</td>
<td>70</td>
<td>3.5</td>
</tr>
<tr>
<td>7  Philippines</td>
<td>90</td>
<td>3.2</td>
</tr>
<tr>
<td>8  Cambodia</td>
<td>102</td>
<td>2.9</td>
</tr>
<tr>
<td>9  Laos</td>
<td>110</td>
<td>2.8</td>
</tr>
</tbody>
</table>

Figure 1. Transportation infrastructure: a country wise comparison of ASEAN

Source: World economic forum

The total length of paved roads in ASEAN is more than one million KM and Vietnam and Malaysia are leading with 0.35 million km of paved roads.

To analyze the influence of transportation infrastructure on real GDP of the region, the technique of Lan (2016) has been used. The study has added the production function of Cobb Douglas with a number of variables explaining various types of infrastructure. Panel data has been used for counties of ASEAN (municipality of Bucharest) over the years 1995-2010. The data was accessed from RNCMNR.

2. Literature review

Extensive literature is available on the chosen topic. Various types of infrastructure development in transportation can be taken as endogenous variable to define the changes in real GDP. Another way is to use TFP (Total Factor Productivity) that is a key economic rive as per the model of Solow Growth (Fernald, 2014). In general, two alternatives exist, which include the use of investment (private and public) as endogenous variable and using the real stock of relevant infrastructure.

Three alternatives are there to have real infrastructure stock. The length of channels of transportation including railways, water, and roads can be used in terms of per capita (Qin, 2016). Another way is to option for spatial density, which refers to the infrastructure stock divided by the area of country/region. Articles are also part a distinct part of literature that provides solutions about the endogeneity caused by the reverse causality. In the
research models, these issues may arise in defining the influence of economic growth by capital stock (Calderón & Servén, 2014). However, it is not evident about the causes for increase. Alternatively, the productivity or output may increase by increase in infrastructure stock. More resources are required to be allocated when there is high output level for accumulation of various kinds of infrastructure (Zia, Hassan, & Khan, 2017). The estimation of the government quality is another distinct part of literature review. In this research, the influence of government quality on the relation of infrastructure transportation and growth of economy has been estimated.

3. Real GDP, total factor productivity (TFP), and alternative approaches

Both methods were used by Elburz, Nijkamp, and Pels (2017) to find the influence of aggregated stock of infrastructure transportation. Further, the researchers analyzed the influence of four different kinds of infrastructure i.e. airport, roads, railways and ports for Spain. The researchers incorporated the variables of transportation in the production function of Cobb-Douglas and determined the influence of these variables on real GDP. Moreover, they determined the TFP values to elaborate through variables of infrastructure (Johansen & Hansen, 2016). Using the fixed regression effects, the following outcomes were found: When there is 10% increase in aggregated infrastructure of transportation, this causes almost 0.42% rise in the output level and 0.38% in TFP.

It was shown by the regressions using various kinds of infrastructure that TFP and GDP, both are greatly influenced by infrastructure of roads. Another interesting finding by Elburz et al. (2017) was a positive network influence of infrastructure of transportation. The similar regressions were conducted to estimate it and they added infrastructure stocks from different regions (geographically close) to one observation rather than data of region. The hypothesis that current infrastructure stocks in a region have positive effects on the regions in neighborhood was tested by the researchers. The coefficients values were high using the aggregate data rather than regional. The overall infrastructure of transportation had increased by 10% that caused an increase of 0.62% in real GDP (Apergis & Danuletiu, 2014). Previously this increase was of 0.04%. The increase in TFP came 0.61%, which was previously 0.38%. Network effect on infrastructure of transportation prevailed in Spain as reflected by the both coefficients.

The network effect of stocks of motorway in terms of workers was found by Na and Yoon (2016). The data of almost 19 OECD countries was used over the years 1990-2006. The researchers found the influence of motorway stock on total factor productivity. Several models were used that comprised of controlled variables. These can be the drivers of TFP. Kasu and Chi (2018) also found the prevalence of network effect by considering the level of utilization of infrastructure transportation to be a key factor for economic development. The influence of transportation was divided into three groups including the direct groups, indirect and related impacts (Chitnis, Sorrell, & Jackson, 2014). The benefits of access to the resources in markets, cost, and time saving, and output increase were included in the direct group. In the indirect impacts, the benefits of transportation infrastructure in relation with other economic sectors were involved (He, Huang, & Wang, 2014). The development of a highway road can increase the level of employment. Moreover, it involves the purchase of materials and related products causing an impact on economic performance. The related impacts include the advantages generated from the relation of quality of transportation and economic performance.

The World Bank (2011) mentioned another influence of transportation infrastructure that signifies its contribution to economic growth and development. The goods can be distributed with low cost through development of railway or road infrastructure, which improves the productivity and access to various resources. Moreover, by infrastructure development of transportation, the reliability of traffic increases resulting in decrease of accidents (Alam, Ferreira, & Fonseca, 2016). The changes in GDP accounted by different kinds of infrastructure such as infrastructure of transportation and roads has been explained by the researchers as below. Some significant results were obtained by Ebuh, Ezike, and Haruna (2019) for countries of Africa. The augmented Solow model was used by the researchers to determine the influence of various infrastructures including water supply, roads, telecommunications, sanitation, and supply of electricity on GDP. The economic growth is significantly influenced by all the sub sectors of infrastructure except the sanitation system. Further, the GDP growth of Africa is contributed by the significant types of infrastructure (Ebuh et al., 2019).
The relation between infrastructure stock and economic development was estimated by Luo and Xu (2018) based on the approach of Ebuh et al. (2019). It was found that the increase in economic growth is linked with high stocks of infrastructure. The study involved data of 16 countries in Asia over the time of 20 years. The dependent variable was the real GDP and the explanatory variables included water supply, electricity supply, roads, sanitation infrastructure, and telecommunications. In the last part of this section, different alternative approaches signifying infrastructure for development of economy have been mentioned. The focus of Mohanty and Bhanumurthy (2018) was on the development and maintenance of infrastructure and its influence on the development of economy and government quality. The findings revealed that infrastructure benefits are greater than its costs. A key driver of infrastructure is the governance quality, rather than infrastructure. The study was based on 75 economies over time of 30 years (Ansar, Flyvbjerg, & Lunn, 2016).

It was shown by Yu (2017) that infrastructure and quality of road is importance for trade in the region of Central Asia and Eastern Europe. A simulation of development of road network in these regions was developed by the researchers. The findings of the simulations revealed that the combined influence of the improvement network quality of road and facilitation of trade lead to gains in both cases. These gains can be expected from reduced tariffs.

**Investments and Real Infrastructure Stock**

**Two data sets were used by** Yoon, Hastak, and Cho (2017). The first data set involved almost 57 countries over the period of 15 years. The second data set involved 19 countries over period of 12 years. Similarly, two different approaches were used by the researchers. Initially, they determined the influence created by infrastructure on growth of economy by using infrastructure spending as endogenous variable. The coefficients for the first dataset based on 57 countries were negative and statistically insignificant. Using the same approach on the second dataset, the coefficients were positive and significant. However, the values of coefficients were small. However, by using physical infrastructure units as explanatory variables with similar sample, the influence on economic development came out statistically significant and positive (Rokicki & Stepniak, 2018). The second approach based on infrastructure stock reflected in physical units can be compared easily between the countries across the globe. The normalization issue arises in using real stock. As mentioned earlier, three ways exists. The first involves infrastructure stock capital divided by total number of workers. Another alternative involves the use of infrastructure stock divided by corresponding country or regional area.

Two regression types were used by Emoh, Edemodu, and Oparaugo (2017). The data set was based on 98 countries and GDP per capital was taken as endogenous variable. In case 1, the independent variable was roads length per inhabitant. In second case, spatial road density was used as independent variable. The most significant results were in case 22, which shows the value of R2 equal to 0.76. The correlation coefficient for the relation of GDP per capital and length of paved roads in terms of per capital were estimated in the first case. Therefore, when there is one-millimeter increase in length of paved roads, the GDP per capita increases by $1.39 and the value of coefficient of determination came out as 0.5. The results of both approaches were significant statistically. The finding of the study shows 1.39 value of coefficient. This helps in explaining the stock of paved roads in the country. The value of coefficient above 1.39 reflects that there is scarcity of roads and improvements are required in the system. The value of coefficient 1.39 shows that such countries have high stock of paved roads and need to improve the maintenance of the current system.

The relation between GNP per capital and paved roads density measured in km per inhabitants (1000) was analyzed by Emoh et al. (2017) based on data of US. OLS technique was used to estimate the intercept and contribution of roads to the growth of economy. There is no clear interpretation for the negative intercept. When the equation goes through origin, the coefficients of roads length per 1000 inhabitants were significant. This shows that a significant influence is created by road length on GDP per capital in the economy. A good possibility is provided by the equation and data to determine the lag of time between infrastructure of roads and its influence on GNP per capita (Maparu & Mazumder, 2017). It was found that there is high correlation between roads length per 1000 inhabitants in the last four years. It shows that GNP is influenced by paved roads. How-
ever, there is a four-year lag between the time of construction and its effect (Emoh et al., 2017). Different kinds of infrastructure were used by Lan (2016) such as transportation infrastructure stock in terms of per worker. The researcher used panel data with cross-country analysis for years 1960-1990 to determine the influence of infrastructure stock (telephones in number, generated capacity of electricity, length of railways and roads). It was found that real GDP is influenced by capital stocks of transportation and electricity. A common econometric issue is Reverse causality for most of the research models, which have been previously discussed. Several approaches can be used to get reliable and robust estimation for reverse causality. The co-integration method was used by Lan (2016) and Chotia and Rao (2017) to find the robust estimates to reverse causality. Another method is to use instrumental variables of lag terms. Therefore, lagged values of infrastructure stocks were used. For determining the relation between voter turnover and local government’s quality, data was used for almost 18 countries of EU and 174 regions. The data was taken from European Election Database (Christmann & Torcal, 2017). The regions of ASEAN were included in the dataset. The model based on multi-level was used, which showed that voter turnover has a positive association with local government’s quality determined by European Quality of Government Index. Specifically, 20% citizens more than usual are active in the regions, where governance is good.

4. Model

To determine the influence of infrastructure on the growth of economy, the approach proposed by Canning (1999) was followed in this research. The production function of Cobb-Douglass was used.

$$\text{GDP}_{it} = AGFP_{it} + RSA_{it}^a + \text{INFS}_{it}^\beta + \text{Lab}_{it}^{1-a-\beta} + U_{it}; \ldots \ldots (1)$$

In the above equation, Y reflects GDP of the region in (t) year. The aggregate productivity is reflected by $AGFP$ and real assets stock is represented by $RSA$. The infrastructure assets stock is represented by INFS, labor is represented by Lab and error term is shown by U. The country index is represented by I and time index by t. It is crucial to incorporate assumptions for research mode. The constant returns to scale are introduced in the model. The second introduction is the log $AGFP_{it} = a + b_1$ which the fixed effect of region is reflected by $a_i$ and the overall productivity of country is represented by $b_t$ in t year. By taking logs of equation 1, the following equation has been derived.

$$\text{Log} (\text{GDP}_{it}) = a_z + b_t + a\log RSA_{it} + \beta \log \text{INFS}_{it} + U_{it}; \ldots \ldots (2)$$

The variables of infrastructure have been separated into four parts. These include the road lengths in t year, available road lengths after improvements in t year, railways length in t year. It is crucial to incorporate the assumption of no difference of quality in the railways and roads of ASEAN. Therefore, the following models will be estimated. The estimation will be started with short research model that reflects the evidence of influence created by infrastructure of road on economic growth of ASEAN.

$$\text{Log} (\text{GDP}_{it}) = a_z + b_t + a\log RSA_{it} + \beta_1 \log \text{Road}_{it} + \beta_2 \log \text{Railways}_{it} + U_{it}; \ldots \ldots (3)$$

An interesting problem is related with the roads quality and the influence created on growth of economy. Two quality types have been used in research because of limitations of data. The roads length modernized in t period and i country and light covering roads are the two forms. These are linked with low quality in the regions, where traffic density is low.

$$\text{Log} (\text{GDP}_{it}) = a_z + b_t + a\log RSA_{it} + \beta_1 \log \text{Road}_{it} + \beta_2 \log \text{Road}_{it} + \beta_3 \log M - \text{Road}_{it} + \beta_4 \log \text{Railways}_{it} + U_{it}; \ldots \ldots (4)$$

One more issue will be tested by using this model. A lag exists between the available road infrastructure stock and its influence on GRP. GRP can be run on the explanatory variables in equation (3) by using various lags.
of time. Time lags of 1-4 will be used, as the data did not allow for long lags. In this way, the results obtained will be robust for endogeneity, which occurs through reverse causality. The variables of light and modernized roads will be classified into two groups. In this way, the administrative status of roads will make them differentiated.

The roads, which connect different cities and units of administration in different counties, are regarded as national roads (n-roads). The roads, which connect cities and units of administration located in the similar county, are regarded as county roads (c-road).

\[
\log(\text{GDP}_{it}) = a_t + b_t + \alpha \log \text{RSA}_{it} + \beta_1 \log n - \text{Road}_{it} + \beta_2 \log L - n - \text{Road}_{it} + \beta_3 \log M - n - \text{Road}_{it} + \beta_4 \log c - \text{Road}_{it} + \beta_5 \log L - c - \text{Road}_{it} + \beta_6 \log M - c - \text{Road}_{it} + \beta_7 \log \text{Railways}_{it} + U_{it} \quad \ldots (5)
\]

Another problem of investigation is to find the influence of local government’s quality on the relation of stock of infrastructure of different transportation with growth of economy. The turnout of voter has been used as a proxy variable for local government’s quality. It was shown by Sundström and Stockemer (2013) that a positive influence is created by the quality of local authorities on participation of voters in elections. Therefore, the sample will be divided into three groups as per the voters’ average turnout during the 2008 and 2012 elections of Senate, shows the structure of classified groups. The dummy variable of ASEAN has been incorporated that is equal to 1 when EU was joined by ASEAN during years 2000-2010 and it is zero in other case. It is expected that the utilization of resources utilization and capital stocks is better when the government is of good quality. For fitting the models, the following data has been used. GRP has been used as endogenous variable in terms of per capita for countries in ASEAN (at 2000 million-dollar constant prices). The method of perpetual inventories has been used for calculating regional capital stock. Following is the capital’s law of motion.

\[
\text{RSA}_{t+1} = (1 - \varnothing) \times \text{RSA}_t + \text{fcf}_t \quad \ldots (6)
\]

In the above equation, the fixed capital formation ($) is represented by fcf, capital stock is represented by RSA in t time. The depreciation is represented by \( \varnothing \). The calculation of depreciation has been done as below:

\[
\varnothing = \left( \frac{1}{t_{t+1} - t_2} \right) \times \sum_{t_2}^{t_{t+1}} \frac{\text{cf}_t}{\text{GDP}_t} \quad \ldots (7)
\]

Where, “cf” consumption of fixed capital in $ in real terms. The GDP in the initial time of 1991 equals 1/3 of the RSA’s first value. The data has been taken from World Bank to determine stock of capital.

5. Estimation

The parameters of true population have been estimated through method of pooled OLS from the sample. The time series and cross section nature of data are neglected in this. To observe the influence of explanatory variables on inflows of FDI (endogenous variable) has been observed through use of pooled OLS. The homogeneity is assumed in terms of cross-country observations in pooled OLS.

The individual countries between WACs are allowed to have time invariant and separate intercepts in FEM. The effects of every country are held constant for a certain time. Moreover, the relation between endogenous and explanatory variables is examined through FEM in every country. In this process, the influence created on the dependent variable is controlled. F-test is done before determining the FEM validity in pooled OLS, which is a common constant method. It is assumed in null hypothesis that a common constant exists for all WACs with a suitable pooled OLS. It is confirmed after rejecting Ho that FEM is consistent and appropriate.

Another way of model estimate is through REM, in which it is assumed that there is uncontrolled and random variation across the countries used in model (Afonso & Arana, 2018). REM can be used, when some influ-
ence is created by countries on the endogenous variable. However, the intercept term is known as random variable having common mean value for the countries (β0) for the economies (Rehman, Khurshid, & Saleem, 2019).

The variables with high correlation value are excluded from analysis, when there is issue of multicollinearity. The issue of serial correlation, heteroscedasticity, and autocorrelation is tested through use of suitable methods of estimation. Wald test and F-test are conducted for Fem and LM is conducted for REM in order to determine the suitable model. For FEM, a Hausman test is conducted as compared with REM. It is determined by Hausman test about the suitable choice for analysis i.e. REM or FEM. Error terms of regression are correlation when there are significant results of test. Therefore, FEM is preferred.

6. Results

Correlation analysis is used to determine the direction and strength of the relationship between latent variables. As illustrated in Table 1, the results show that all variables, have a positive relationship with ECN.

Table 1. Correlation Analysis

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>RGDP</td>
<td>1.00</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Road</td>
<td>0.15</td>
<td>1.00</td>
<td>(0.41)</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Railways</td>
<td>0.20</td>
<td>0.13</td>
<td>1.00</td>
<td>(0.27)</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L-Road</td>
<td>0.26</td>
<td>-0.13</td>
<td>0.41</td>
<td>1.00</td>
<td>(0.15)</td>
<td>(0.46)</td>
<td>(0.02)</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>M-Road</td>
<td>0.03</td>
<td>-0.12</td>
<td>0.43</td>
<td>0.03</td>
<td>1.00</td>
<td>(0.87)</td>
<td>(0.52)</td>
<td>(0.01)</td>
<td>(0.88)</td>
</tr>
<tr>
<td>L-n-Road</td>
<td>0.311</td>
<td>0.03</td>
<td>0.23</td>
<td>0.31</td>
<td>0.13</td>
<td>1.00</td>
<td>(0.01)</td>
<td>(0.87)</td>
<td>(0.52)</td>
</tr>
<tr>
<td>M-n-Road</td>
<td>0.411</td>
<td>0.543</td>
<td>0.762</td>
<td>0.052</td>
<td>0.362</td>
<td>0.234</td>
<td>1.00</td>
<td>(0.01)</td>
<td>(0.627)</td>
</tr>
<tr>
<td>L-c-Road</td>
<td>0.271</td>
<td>0.103</td>
<td>0.223</td>
<td>0.231</td>
<td>0.123</td>
<td>0.237</td>
<td>0.291</td>
<td>1.00</td>
<td>(0.01)</td>
</tr>
<tr>
<td>M-c-Road</td>
<td>0.411</td>
<td>0.543</td>
<td>0.162</td>
<td>0.352</td>
<td>0.722</td>
<td>0.234</td>
<td>0.231</td>
<td>0.331</td>
<td>1.00</td>
</tr>
</tbody>
</table>

It has been revealed by Hausman test that the value of chi2 is 259.64 and value of p is zero. These results have been estimated through use of fixed effect regression. There is insignificant influence of the overall roads stock. However, the light and modernized roads create a positive and significant influence as indicated by the coefficients. Further, the influence of modernized or improved roads is four times greater than the light covering roads. The magnitude of influence of both types of roads is large, which is unrealistic (Van Bommel, 2014). Therefore, when there is 10% increase in light covering roads, this causes GRP to increase by 6.8%. There is doubt on this result. During the estimation exercise, we conducted a number of tests that included the Redundant Fixed Effects test and Hausman test. For instance, the Redundant Fixed Effects test was conducted to test the hypothesis that time-specific effects are present in the time series and cross section data (Abu, Karim, & Aziz, 2014). This test enables us to determine if the pooled Ordinary Least Squares (OLS) estimation is appropriate or not and whether one should use the FE/RE estimation. Similarly, the Hausman test was performed to determine if the RE estimates are correct and preferred to the FE and GMM estimates (see Table 2).
Table 2. Regression results of fixed effect estimates (equation 2-5)

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>Model 2</th>
<th>Model 4</th>
<th>Model 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>RSA</td>
<td>0.177***</td>
<td>0.135**</td>
<td>0.213***</td>
</tr>
<tr>
<td>Road</td>
<td>0.198**</td>
<td>0.154**</td>
<td>0.239**</td>
</tr>
<tr>
<td>Railway</td>
<td>0.254**</td>
<td>0.0238**</td>
<td>0.321*</td>
</tr>
<tr>
<td>L-road</td>
<td></td>
<td>0.313*</td>
<td>0.244*</td>
</tr>
<tr>
<td>M-Road</td>
<td></td>
<td>0.0488*</td>
<td>0.293*</td>
</tr>
<tr>
<td>L-n-Road</td>
<td></td>
<td></td>
<td>0.219**</td>
</tr>
<tr>
<td>M-n-Road</td>
<td></td>
<td>0.231**</td>
<td></td>
</tr>
<tr>
<td>L-C-Road</td>
<td></td>
<td>0.234*</td>
<td></td>
</tr>
<tr>
<td>M-C-Road</td>
<td></td>
<td>0.816**</td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.740</td>
<td>0.518</td>
<td>0.821</td>
</tr>
</tbody>
</table>

To run the research model as shown in equation (4) by using different sub-samples is another issue. ASEAN was categorized into 7 development regions. There was no administrative or official status of these regions. These regions were formed to facilitate the reforms before joining European Union. Almost 5-7 countries were included in each of these regions. According to the results of Hausman test conducted for every development region, it was revealed that fixed effect method is suitable rather than Random effect. Table A1 represented the results. In every region, the influence of overall capital stock is statistically significant and positive. In all the development regions, the roads with improvements and light covering create a significant and positive influence. A positive and significant influence of stock of railways has been found in the Sud-est and Nord-est regions. However, the influence of overall roads stock in all the regions is insignificant. In South development region, the influence of light and modernized roads is greater.

The results after examining the influence of local government’s quality have been shown in the next table. The roads with distinct covering quality are differentiated by this model along with various administrative statuses. The county and national roads have been considered separately. The influence of county and national roads on growth of economy must differ because of use of road systems in ASEAN for national and international transportation. It is expected that the influence of county roads is low but significantly positive. The transportation in the country is based on the network of country roads.

Conclusion

The influence of infrastructure of transportation on economic growth for various countries in ASEAN has been estimated in this research. This influence differs in terms of administrative status and quality across the counties. GRP has been used as an economic growth measure in terms of per worker along with various kinds of infrastructure of transportation for years 1995-2010. Therefore, a short model has been incorporated with capital stock of railways and roads. Two variables have been incorporated to differentiate roads with different covering and quality. In the next step, the administrative status of roads has been distinguished. The results have revealed difficulty in interpretation because of the problem of endogeneity and reverse causality. Therefore, the research model was modified by including the lag values of variables of infrastructure of transportation for getting robust estimates (Arbués, Baños, & Mayor, 2015). The unit root test has been performed and first differences in model are used to obtain stationary time series. It was found that GRP per worker is greatly influenced by overall roads stock. This is because of the use of such roads for large traffic load (Sobrino & Monzon, 2014). The regional growth of economy is greatly influenced by the light covering roads rather than national roads of similar quality/covering. The influence of local government’s quality was controlled on development of economy (Rodríguez-Pose & Garcilazo, 2015). The turnout of voters was used as proxy variable for the local government’s quality. It was found that the influence of infrastructure of transportation stock in the areas (where government is of better quality) has not much influence on GRP per worker. Different kinds of infrastructure of transportation have been shown by this research being the drivers of growth of economy in ASEAN (Chia, 2014). The administrative status and quality of covering roads creates an influence on the growth of economy.
Articles are also a distinct part of literature that provides solutions about the endogeneity caused by the reverse causality. In the research models, these issues may arise in defining the influence of economic growth by capital stock (Agbloyor, Abor, & Yawson, 2014). However, it is not evident about the causes for increase. Alternatively, the productivity or output may increase by increase in infrastructure stock. More resources are required to be allocated when there is high output level for accumulation of various kinds of infrastructure (Zia et al., 2017). The estimation of the government quality is another distinct part of literature review. Based on the findings of study, the following recommendations have been made. There is need to develop national roads to improve the economic performance. Further, there is need to improve the quality of countries. However, the influence of infrastructure transportation is high where the government has low quality and overall capital stock influence is high where the government is of good quality (Crescenzi, Cataldo, & Rodriguez, 2016). In future, researches can be conducted by focusing on the influences of other variables of infrastructure including electricity lines, supply of water and for long time periods. The future studies can work on investigating the network effect of transportation infrastructure in ASEAN.

References


697


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Abstract. Economic growths are often used to measure the development of a country. Thus, the economic growth is what every economy tries to achieve for good of everyone as a whole. In the other hand, education, health and employment are one of the most important tools for the economy growth. Thailand as developing countries concern about the economy growth and done an investment in it. The general objective of this paper is to examine the relationship between education, health, employment and economic growth in Thailand from 1988 to 2017. The econometric method is used to examine the relationship between education, health, employment and economic growth. Unit root test indicate that all of the above variables are I (1). Johensen’s test was conducted to see the long run relationship between these variables. Meanwhile the relationship is test by using Ordinary Least Square and the Granger Causality test. The relationship between education with the economic growth are examine by using the literacy rate as education proxy variable. The health variable is examining by using the infant mortality rate, life expectancy and crude death rate with the GDP and the employment are examine by using the total employment rate with the GDP. As conclusion the results shows the positive relationship between the three variables with the economic growth and suggestion to the Thailand economic to do more investments in this variable. The findings of this study can be used to generate concrete policy reform suggestion and also used as guideline or example for other developing countries.

Keywords: Health; Employment; Education; Economic growth

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JEL Classifications: 01, 016

1. Background

The main aim of the study is to examine the relationship between education, health, employment and economic growth in Thai. The main purpose of this paper is to show that this three-variable playing a role as economic tool in the Thai growth and suggestion will be provided so that the government can give concern on this variable in developing the nations. The statement above clearly state that the education and health are important in developing a nation and it’s also showing that the health and economic have two-way relationship which means both of this variable have correlated each other in helping the nations development. Idris and Rahmah Ismail as note that the Thai economy growth is now in the era of knowledge – based economy and the role of human capital has a direct relationship with worker productivity, hence contributing positively to economy (Fleming, 2017). As per stated in the purpose of this study to examining the relationship between education, health, employment and economic growth. Thai at the moment in the new economy model which means the concerns is given more to the human capital (Fleming, 2017). Human capital development includes education, health and
productivity. Productivity depends on the employment rate. Other than that, there is existing studies to examining the relationship between the health, education and economic growth (Panfiluk, Szymańska, 2017; Reinhold et al., 2019; Chistobaev et al., 2018; Gomes et al., 2018; Bernardi, 2019). Besides, there is study have been done thorough out the health, employment and economic growth. The Thai government spends a lot to improve the education, health and employment for the positive growth rate. the issue here to examining the relationship between this three variable towards the economy growth and does this three variables important to the economy growth until the government spending increase from the year to the year (Haile & Niño‐Zarazúa, 2018).

In other hand, there is none of the studies have been done to examining relationship between education, health, employment and economy growth. Thus, this study has been done to examining the relationship between this variable answer those question. Does education have relationship with the Thai economy growth? Does health have relationship with Thai economy growth? And the last question is does employment has relationship with Thai economy growth? The findings of this study can be used to generate concrete policy reform suggestion and also used as guideline or example for other developing countries.

2. Literature review

The Effective Wage Theory advocates that a worker has receive sufficient remuneration in order for him/her to be motivated to work diligently (Jermsittiparsert, Sriyakul, & Pamornmast, 2014). This is made possible only after one has fulfilled the basic needs. Nutritious food will not only contribute to the wellbeing of the person but also enhance the productivity of the firm (Felipe & McCombie, 2019). In the long run even, the country will benefit from the increased productivity of the firm. A functional Approach to health brings to attention the fact that an increased number of sick individuals in particular time frame can significantly reduce the contribution to national output (Jermsittiparsert & Sriyakul, 2014). On the other hand, societies are heavily industrialized can afford to have more sick members in society at one go compared to developing nations that depend on the availability of the human force in the agricultural and horticultural sectors (Harper, Harper, & Snowden, 2017). Wei, Ren, and Zhou (2013) concluded in his study that there were “…some strong patterns of interaction between growth and basic welfare.” He added that expenditure on basic needs can be seen as an investment in human capital and that rapid output growth is essential for equity of life, The World Development Report (1993) argued that besides encouraging rapid income growth, it is essential to have investment in education, especially in the poor countries to strengthen the people’s capacity to achieve better health (Organization, 2015).

Werfalli (2019) noted that the world’s poor were mainly found in Sub-Saharan Africa and South Asia with a population of 3.2 billion and per capita income of $390 per year. The increase in access to education and practice of preventive health care proved successful in reducing the fertility rate, from 5.6 births per woman in the 1970s to 3.3 in 1994. Bongaarts, Mensch, and Blanc (2017) concurred that education is important in alleviating the problem of poverty. When female education increases the value of women’s time in economic activities, this creates a rise in household income and reduction in poverty. Smaller sized families will have a better nutritional supply, greater access to education and also benefit from the available health care system. This creates a healthy work force that will be able to contribute to the economic growth of the country. Foster (1995) noted in his study “… caloric allocations efficiently capture potential return to productivity” (Felipe & McCombie, 2019). in a study scholar noted that an improvement in nutrition intake had accounted for about 30 percent of income per capita growth in Britain between 1970 and 1980. Delgado and Stefancic (2017), in his study, asserted that the establishment of a comprehensive system of health care and education will be essential to counteract the social ills that a society faces. Haile and Niño-Zarazúa (2018) concluded, among others, that government spending has been important in improving the health status and education level of the poor, but still has a long way to go in many developing countries before trade-off with economic growth is generated. Khusaini (2016) noted that economic growth and productivity improvement depend on research and development, investment in plant equipment, investment in infrastructure; and investment in human resource development. Human resource development and the creation of a skilled, productive and adaptable workforce depend on the education system, healthcare, training and retraining, family policy, labor- management, policies at the workplace and the general health of public service.
A study was conducted by Kvangraven (2016) on the countries of Sub-Saharan African. The researchers found that the performance of the countries was improved as compare with 1980s and 1990s. However, the economic performance of these countries is still behind Latin America and Asia. The economies with high growth rate did not show low rate of poverty better opportunities of employment, decrease in gender inequalities and high attainment of education. The issues of employment exist in the countries sub-Saharan Africa. This is a quality matter rather than quantity. The reason for this is weak performance in terms of employment do not exist in the rigidities of labor market. The weak economic performance and decrease in demand of labor can explain the increase in observed working poor. The relation between labor market and economic growth was analyzed by Olusoji (2016). The researcher found that the relation between unemployment change and GDP growth is classified in two main factors. These factors include the employment changes and rate of unemployment governed by demographic influences, economic factors, and policies of labor market (Ehrenberg & Smith, 2017). Using time series data for every country of EU and panel data for cross country analysis. A strong and positive correlation was found between employment change and growth of GDP.

Using the ratio of employment to population, employment was measured by Kareem (2015) that determines the extent with which population is involved in the productive activities in the labor market. Moreover, it is referred as the percentage of working age population in the country, which is employed. It was found that there is a positive and significant relation between employment and GDP. The findings are consistent with theoretical perspective that it is normal to have positive relation between employment and GDP (Greiner, Semmler, & Gong, 2016). However, the development of jobless growth is not a permanent deviation, as employment can occur soon.

A paper was published by Verdoorn in late forties in which a linear and close relation between productivity of labor and growth of industrial output was stated in long run. It was found by Verdoorn that the productivity elasticity with regard to industrial production was .45. This was used for prediction of productivity (Felipe & McCombie, 2019). The productivity elasticity was defined by Verdoorn and Kaldor as the reflector of increasing returns to scale because of higher labor division. The findings of cross-country analysis of Kaldor showed that these were similar to the results of Verdoorn. According to findings, when there is 1 percent increase in output growth, this results in increase of 0.5 percent in employment growth. It is important to note unemployment cannot be controlled easily, when there is greater effect of productivity on growth (Piore, 2017).

3. Model

In this section, the discussion is focused on the specification of the model and divided the data for Gross Domestic Product and variables. This paper employed the ordinary least square test methodology to examining the direction of the relationship between GDP with education, health and employment in Thai. To verify the variables, Augemented Dickey Fuller (ADF) Unit Root Test based on well-known Dicker-Fuller producer is used. The Granger Causality tests are employed to test the correlation and possible relationship among the variables and the economic growth. This econometric test is forgoing with correlation test on the variable employed in the study (Rafindadi, 2016).

The idea of economies to growth or generate higher economic surplus was developed by the Western countries in the initial modern period. The developed surplus could be used on other things rather than subsistence. For instance, it can be incurred on warfare, religious projects, consumption, etc. as per the traditional view, surplus can be generated by increase in tax rates or population in the country. The growth of economy is referred as the reorganization and replacement of human activities supported by investment for maximization of returns (Farley & Voinov, 2016).

The development of cultural systems and life support, which is self-organized, is highly flexible and creative but unpredictable as well. The self-organizing systems are difficult to form, and mixed results have been produced by developing evolution of economies in long term. Increase in the total amount of specie, which is the medium of circulation (gold or silver), was referred as growth in the period of Mercantilist (Pred, 2017). Because of this theory, policies were developed to impose trade through a specific state. The cheaper supply of
raw materials was acquired by colonies that can be sold after manufacturing.

Afterwards these policies were regarded as to promote domestic industry and trade. The 18th century policies were because of the improved manufacturing capability because of which raw materials were imported and finished goods were exported referred to the post-Bullionist insight. The manufacturers were allowed to develop factories under the high tariffs system. Fixed costs of capital growth were paid by local markets and these were allowed for export internationally by undercutting the manufactured goods prices (Schwartz, 2019).

As per the growth theory, monopolies were granted to improve growth, which offer incentive to use a resource or market. The individual has the confidence to generate profits by eliminating the competitors from business. Such examples include British East India Company and Dutch East India Company, which were given monopolies by the state. It was considered in this period that advantageous trade could result in growth (flow of specie within the country). However, it was disadvantageous to trade with other countries on equal terms. In Mercantilism, it was not just the restriction of trade. It was regarded as the elimination of trade barriers within a country and development of new roads by destroying the local booths. The aim was to expand the markets. This referred to the power centralization in the Crown’s hands the modern nation state was produced by this process in Western Europe. Contradiction was resulted from Mercantilism at international level. Trade lead to growth. However, it was disadvantageous to trade on equal terms with other countries (Munim & Schramm, 2018). The criticism of Mercantilism leads to the modern concept of economic growth. This modern political economy was founded by the physiocrats and scholars of Scottish Enlightenment i.e. Adam Smith and David Hume. These scholars suggested that growth is allowed by the productivity capacity and increase of capital result in generation of “the wealth of nations” (Salter & Young, 2019). However, the significance of agriculture was emphasized by these scholars and urban industry was considered as sterile. It was argued by David Ricardo that a country could be benefited by trade. When cheap things can be sourced from abroad, it is profitable to buy from there. This is referred as comparative advantage theory, which is the base for trade across countries. Therefore, free trade is crucial for growth of economy.

The Growth Model of Solow-Swan is referred as growth because of increased level of capital goods. A series of equations are involved in the model that represents the relation between capital goods, investment, labor time, and investment. Technological change has a crucial role as compared with capital accumulation. In 1950s, the long growth was analyzed by Robert Solow and Trevor Swan by the development of this model. It is assumed in this model that resources are efficiently utilized by countries and labor increases and capital has diminishing returns.

Three key predictions are made by the neoclassical model from these two aspects. Economic growth is created by increasing capital relative to labor. With more capital, people become more productive. Moreover, there will be faster growth in the countries with less capital per person as every capital investment will result in greater returns as compared with the rich economies with sufficient capital (Aghion, Comin, & Tecu, 2016). Further, a point will be reached by countries due to diminishing capital returns. At this point, economic growth will not be influenced by increase in capital. This state is referred as steady state. This steady state can be overcome by the countries by technological developments. The rate of savings determines the per capital output in long run. However, the rate of growth in output must equate with rate of any saving. The process of continued growth of countries irrespective of the diminishing returns is explanatory in this model. It shows the development of innovative technology, which allows the production using limited resources. The capital level increases with improvement in technology at the steady state. The economy grows with investments in the country. The predictions of this model for similar growth rate for all countries in long run have not been supported by the data. Moreover, the faster growth of poor countries until the steady state is reached is not fulfilled by data (Samarzandi, Fidrmuc, & Ghosh, 2015). It is suggested by the data that growth rate of world has increased at a low rate. It has been shown by the modern economic research that there is no evidence for the support of neoclassical economic growth model. It was claimed by the calculations of Solow that most of the economic growth is because of development of technology as compared with the labor and capital inputs.
However, it has been found by the recent economic research that the labor input and investment changes have not been taken into account by the calculations. In 2000, the president of American Economic Association Dale Jorgenson, of Harvard University, found that most of the residual of Solow is explained by the changes in capital quality, investment goods, and labor inputs. It has been estimated that more than 85% growth is accounted by the labor and capital inputs for years 1945–1965. However, 15% is because of growth in productivity (Rabushka & Kress, 2019). This shows the rapid obsolescence of earlier research on productivity using Kuznets and Solow convention. The theories developed by Paul Romer in 1980s and 1990s made advancements in the theory of growth.

Some new theories of growth include Robert J. Barro and Robert E. Lucas. Economists were not satisfied with the explanation of Solow and tried to endogenize technology during 1980s. The theory of endogenous growth was developed, which included explanation for advancements of technology in mathematical terms. A new concept of human capital is involved in this model along with knowledge, skills, which lead to productivity of workers (Fleming, 2017). There are increase rates of return for human capital unlike physical capital. The capital has constant returns and steady state is never reached by the economies. With the accumulation of capital, growth is not slowed. However, it is based on different types of capital investments made by a country. The focus of research in this domain is based on the factors increasing human capital such as technological change or education.

It has been suggested by the recent empirical analyses that cognitive abilities differences linked with schooling and some other factors lead to changes in rate of growth across the countries. Knowledge and intelligence are involved in cognitive abilities and these are crucial than education. These abilities are relevant as compared with the factor of economic freedom in classical growth theory (Rindermann, Kodila-Tedika, & Christiansen, 2015). Comparatively, the level of competence of high ability group is crucial than low and mean ability groups in the societies. This is improved through innovation, growth, research and other elements such as democracy.

\[ Y = f(\text{education, health, employment}) \]

Y in the equation above represents Thai Gross Domestic Product (GDP). Meanwhile the variable Edu represent education and the proxy variable for education is literacy rate. In other hand, health representing infant mortality rate, life expectancy rate and crude death rate proxy variables (Bader & Ganguli, 2019). Employment variables represent the total employment rate. Y in the equation is states as dependent variable and other three variables in the equation are known as independent variable. This equation states merely that at any moment, the economy growth has relationship between education (literacy rate), health (infant mortality rate, life expectancy rate and crude death rate) and employment (total employment rate). The finding of this study is expected to show that economy growth has the positive relationship if the education variable increase, health variable increase (expectancy rate) and decrease in the (infant mortality and crude death rate) and increase in the employment (total employment rate).

**Gross Domestic Product (GDP)** GDP may therefore be viewed as rough indicator of a nation’s property. Nevertheless, GDP are commonly used to examining the economic performance and the relationship between other variables (Ozturk, 2016). In other hand, GDP are used to measure the nation’s economy growth which means the positive impact are seen if the GDP have positive correlation with the variable tested.

**Literacy rate:** It is referred as the ability to write and read. Different theoretical aspects have defined this concept differently. According to the UNESCO, it is the ability to identify, communicate, interpret, and use different written and printed contexts. Literacy rate is one of the health variables which gives the impact to the economy growth. In human capital theory by Gary Becker showing that education has positive impact towards the nations growth (Shuaibu, 2016).

**Infant mortality:** It is referred as the total number of deaths of infants aged between 0-1 per live births of 1000.
The diarrhea has been the main reason, which causes dehydration. The rate of children dying from dehydration has decreased with the increase in awareness regarding Oral Re-hydration Solution, which is a combination of sugar, water, and salts. Ijaz (2018) shows that the growth of the nation’s economy depends on the infant mortality too. Whereby decrease in this variable will show the positive impact towards the economy growth.

**Life expectancy:** it is the number of expected life years left at a specific age. This is represented by $e_x$ that shows the average number of previous years of someone aged $x$ at present, as per the specific experience of mortality. It used as one of the health variables to examining the relationship with the GDP. Ijaz (2018) has been said that the life expectancy is one of the important indicators in the economy growth and has positive relationship with the economy growth. Increase in life expectancy will contribute to the economy growth.

**Crude death rate:** It is regarded as the total deaths (in numbers) in a specific geographical region such as state, country, etc, divided by the total number of populations in the same region, and multiplied with 10000. It is determined for specific time, most commonly a calendar year. Bevillé (2018) in their arguments said that the fall in death rates gives the positive impact to the nation’s economic growth.

**Employment:** Total employment rate are used to examine the relationship between the employment rates with GDP. Kareem (2015) found a significant and positive relationship between GDP and employment. Increase in the total employment show as positive relationship with GDP.

$$\ln(\text{RE}_{it}) = \gamma_0 - \gamma_1 \ln(\text{Edu}_{it}) + \gamma_2 \ln(\text{Inf}_{it}) + \gamma_3 \ln(\text{Expt}_{it}) + \gamma_4 \ln(\text{CrD}_{it}) + \gamma_5 \ln(\text{Employ}_{it}) + \epsilon_{it} \ldots \ldots \ldots \ldots \ldots (1)$$

Longarithima terms will be impose in the equation above as the variable data collected in the percentage while the GDP in term of million. Thus Jeffery M Wooldridge (2009) in this book of introductory econometric modern approach finds that a multiple regression model suffers from functional from misspecification when it does not properly account for the relationship between the dependent and the observed explanatory variable. Equation (1) $\text{RE}_{it}$ shows the economy growth thru the GDP where is a GDP, $\text{Edu}_{it}$ representing the literacy rate, $\text{Expt}_{it}$ represent the infant mortality rate and representing the life expectancy rate, $\text{CrD}_{it}$ represent the crude death rate, represent the total employment rate and the is the error term. The constant is denoting $\gamma_0$ for while $\gamma_1 \ldots \gamma_5$ are the coefficient show how much a unit of increase in each variable will affect the economy growth.

4. Data and Estimation

This test is used to analyze about the stationary or non-stationary data involved in research analysis. When the trend of time series variables does not have movement (upward and downward) with time, it is called stationary. The values of autocorrelation, variance, and mean of the data are constant with time in case of stationary data (Gujarati, 2006). When these requirements are not met by the variables involved in time series, the data is non-stationary. To obtain valid statistics of $F$ and $t$ values, the time series data must fulfill the stationary conditions (Hossain, 2008). Mostly, the test of Dickey-Fuller is used as unit root. The stationarity of the variables is tested by unit root test. For this, ADF/DF is applied (Enders, 1995; Jeffrey M Wooldridge, 2016). In this process, the OLS method is used to obtain the t-statistics by regressing equation. There is white noise error term involved that has unit variance and zero mean. The Tau statistics are used in the calculations that are tested for null hypothesis against the alternative hypothesis (MacKinnon, 1991). When the variables stationary at level, this means unit root exists. When the variables are stationary at first different, they are regarded as integration of 1st order. If it requires second difference to make the variables stationary, these are referred as stationary at 2nd difference and so on. In case, the above assumption is violated, the equation is modified into 3.3 using lagged changes of $p$ in the endogenous variable using additional regression. This has been shown as below:

In Dickey-Fuller test, the null hypothesis and alternative hypothesis are as below:

H0: $B_1 > 0$

H1: $B_1 < 0$
The model specification is the central concept in the cointegration. This involves the long run movements of a variable in relation to the other variables. In explanation, the existence of long run equilibrium association between the variables is clarified. When the variables in time series show stationarity at level, they can be integrated with first order. The cointegration of these variables can be done when there exist one or more linear relations between the stationary variables. A constant long run linear association exists between the variables when they are co integrated. Engel and Granger (1987) firstly introduced the test of co-integration and it was modified by several researchers i.e. Stock and Watson (1988) and Johansen and Juselius (1990). The suggestion of Padhan (2008) has been followed for using AIC to determine the equation 3.4’s optimal specification. The suitable order of the model is evaluation through calculating the above-specified equation over selected values and k lag. The p-value is found at which the minimum AIC is attained. The study used the critical values of MacKinnon (1991) and ADF has non-standard distribution. It is useful in determine the relation of long run equilibrium between variables. The approach of Johansen maximum likelihood (ML) has been used to check co-integration. It is the most appropriate and reliable technique for small size and properties of sample. This method has another key benefit, which is the estimation of several co-integration relations in a simultaneous way. Two statistics have been used for checking co-integration, which are maximum eigenvalue and trace test. Following is the process of estimating these statistics.

\[ \Delta X_t = A_0 + \varphi X_{t-p} + \sum_{i=1}^{p-1} A_i \Delta X_{t-i} + \varepsilon_t \ldots \ldots (2) \]

\( \varphi \) is the vector and X being the variables in the equation (3.5). Therefore, the rank of \( \pi \) has been used to test the relation of long run equilibrium between the variables. Considering r zero, the equation (3.5) can be transformed to pth order VAR model. There is no co-integration relation between the variables at level. Rather, there are n X r matrices of \( \alpha \) and \( \beta \).

\[ \varphi = \alpha \beta' \ldots \ldots (3) \]

\( \alpha \) determines the strength of cointegration relation and \( \beta \) is cointegrating vector. \( \beta' \) is integrated of order 0.

\[ \Sigma_{vv} = \left( \frac{1}{T} \right) \sum_{T=1}^{T} v_t v'_t \ldots \ldots (4) \]

\[ \Sigma_{pp} = \left( \frac{1}{T} \right) \sum_{T=1}^{T} p_t p'_t \ldots \ldots (5) \]

\[ \Sigma_{vp} = \left( \frac{1}{T} \right) \sum_{T=1}^{T} v_t p'_t \ldots \ldots (6) \]

The maximum likelihood estimator of ‘\( \beta' \) can be obtained by solving:

\[ [\eta \Sigma_{pp} - \Sigma_{v} \text{INV}(\Sigma_{vp} \Sigma_{vv})] = 0 \ldots \ldots (7) \]

Here the \( \eta (\eta_1, \eta_2, \ldots, \eta_n) \) reprinting eigenvalue and the normalize co-integration vector is as follow

\[ \beta' \Sigma_{pp} \hat{\beta} = 1 \ldots \ldots (8) \]

In this test, the null hypothesis of r co-integrating vectors is tested against the alternative hypothesis of r =1 co-integrating vector. Hence the null hypothesis r =0 is tested against the alternative r =1, r =1 against the alternative r=2 and so forth. It is well known that the co-integration test very to the choice of lag length. The Akaike Information Criterion (AIC) and Scfvarz Bayesian Criterion (SBC) are used to select the number of lags required in the co-integration test. If there exist a co-integration vector between that variable, there is possibility of causality between the two at least in one direction (see Granger, 1988). Thus, Granger causality test
can be used to examine the nature of the relationship (Engle & Granger, 1987). If

\[
\eta = L_A - L_0 = \left( \frac{\hat{c}}{2} \right) \sum_{t=\tau+1}^{\infty} \log(1 - \hat{\eta}) \ldots (9)
\]

\[
2(L_A - L_0) = 2\left( \frac{\hat{c}}{2} \right) \sum_{t=\tau+1}^{\infty} \log(1 - \hat{\eta}) \ldots (10)
\]

\[
\eta_{\text{max}} = -T \log(1 - \hat{\eta}_{\tau+1}) \ldots (11)
\]

In this test, the null hypothesis of \( r \) co-integrating vectors is tested against the alternative hypothesis of \( r = 1 \) co-integrating vector. Hence the null hypothesis \( r = 0 \) is tested against the alternative \( r = 1 \), \( r = 1 \) against the alternative \( r = 2 \) and so forth. It is well known that the co-integration test very to the choice of lag length. The Akaike Information Criterion (AIC) and Schwarz Bayesian Criterion (SBC) are used to select the number of lags required in the co-integration test. If there exist a co-integration vector between that variable, there is possibility of causality between the two at least in one direction (Engle & Granger, 1987). Thus, Granger causality test can be used to examine the nature of the relationship (Engle & Granger, 1987).

\[
\text{RGDP}_{it} = \sum_{t=1}^{n} \beta_i \text{Edut}_{it-1} + \sum_{t=1}^{n} \beta_j \text{RGDP}_{it-1} + \varepsilon_{1it} \ldots (12)
\]

\[
\text{Edut}_{it} = \sum_{t=1}^{n} \beta_i \text{RGDP}_{it-1} + \sum_{t=1}^{n} \beta_j \text{Edut}_{it-1} + \varepsilon_{2it} \ldots (13)
\]

\[
\text{RGDP}_{it} = \sum_{t=1}^{n} \beta_i \text{inf}_{it-1} + \sum_{t=1}^{n} \beta_j \text{RGDP}_{it-1} + \varepsilon_{3it} \ldots (14)
\]

\[
\text{inf}_{it} = \sum_{t=1}^{n} \beta_i \text{RGDP}_{it-1} + \sum_{t=1}^{n} \beta_j \text{inf}_{it-1} + \varepsilon_{2it} \ldots (15)
\]

\[
\text{RGDP}_{it} = \sum_{t=1}^{n} \beta_i \text{ExptR}_{it-1} + \sum_{t=1}^{n} \beta_j \text{RGDP}_{it-1} + \varepsilon_{2it} \ldots (16)
\]

\[
\text{ExptR}_{it} = \sum_{t=1}^{n} \beta_i \text{RGDP}_{it-1} + \sum_{t=1}^{n} \beta_j \text{ExptR}_{it-1} + \varepsilon_{2it} \ldots (17)
\]

\[
\text{RGDP}_{it} = \sum_{t=1}^{n} \beta_i \text{CrD}_{it-1} + \sum_{t=1}^{n} \beta_j \text{RGDP}_{it-1} + \varepsilon_{2it} \ldots (18)
\]

\[
\text{CrD}_{it} = \sum_{t=1}^{n} \beta_i \text{RGDP}_{it-1} + \sum_{t=1}^{n} \beta_j \text{CrD}_{it-1} + \varepsilon_{2it} \ldots (19)
\]

\[
\text{RGDP}_{it} = \sum_{t=1}^{n} \beta_i \text{Employee}_{it-1} + \sum_{t=1}^{n} \beta_j \text{RGDP}_{it-1} + \varepsilon_{2it} \ldots (20)
\]

\[
\text{Employee}_{it} = \sum_{t=1}^{n} \beta_i \text{RGDP}_{it-1} + \sum_{t=1}^{n} \beta_j \text{Employee}_{it-1} + \varepsilon_{2it} \ldots (21)
\]

**Data**

The data for this study have been drawn from four main sources: The Ministry of Finance (Economic Report), World Bank Data, Department of Statistics and also from Ministry of Information, Communication and Culture. The study covers 30 years from 1988 to 2017. There was no problem with the data collection process as regards the GDP time series where different sources are available to provide the required data for the whole study. Regarding the education, it was not possible to find annual time series for literacy rates. Three health variables and total employment data was collected from different sources.
Results

Stationarity of variables has been checked before VAR and cointegration. When the data has constant value for mean and variance with time, it is regarded as stationary (Enders, 2004). The initial step is to check the integration at level. The past shocks create a undiluted influence and there is infinite variance and mean based on time, this is referred as integration. The test recommended by Dickey and Fuller has been used in this study to check the unit root properties for variables (ADF, 1979, 1981). When the variables are not stationary at level, these can be made stationary at first difference using similar lags level (Table 1).

<table>
<thead>
<tr>
<th>Variable</th>
<th>First Difference</th>
<th>Constant</th>
<th>Constant and Trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>RGDP</td>
<td>-1.9234191910</td>
<td>-0.6318121310</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.2364)</td>
<td>(0.6211)</td>
<td></td>
</tr>
<tr>
<td>Edu</td>
<td>-1.5318121310</td>
<td>-0.7232341120</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.3451)</td>
<td>(0.2271)</td>
<td></td>
</tr>
<tr>
<td>Inf</td>
<td>-1.7392812110</td>
<td>-0.8237162111</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.4721)</td>
<td>(0.7212)</td>
<td></td>
</tr>
<tr>
<td>ExptR</td>
<td>-1.7238180110</td>
<td>-2.0352515115</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.5237)</td>
<td>(0.9721)</td>
<td></td>
</tr>
<tr>
<td>CrD</td>
<td>-1.8234191910</td>
<td>-2.9234191910</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.4236)</td>
<td>(0.7821)</td>
<td></td>
</tr>
<tr>
<td>Employee</td>
<td>-1.2716912610</td>
<td>-2.7825151110</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.2716)</td>
<td>(0.7625)</td>
<td></td>
</tr>
</tbody>
</table>

AIC has been used to find the suitable length of lag. Thus, the unit root test was been done to the entire variable to determine the significant of this variable. The test has been run by using the EVIEW software and Augmented Dickey Fuller type of test are been used to test the unit root test. The variable test at level and first difference by using the constant and constant plus time trend test equation. It has been confirmed by the study that the variables involved in the study are integrated of first order. To check the long run relationship among the variables and its nature, the co-integration test has been performed. The variables in the null hypothesis were co-integrated against the alternative hypothesis. The results show the existence of co-integration. (Engle & Granger, 1987) did the pioneering work on co-integration analysis and this was extended by Stock and Watson (1988), Johansen and Juselius (1990). The presence of co-integration association between ln GDP with ln ltc, ln RGDP and ln inf, ln etc, ln cdr, has been tested in this study. And the last relationship is ln gdp with ln emp. The co-integration test based on Johensen’s approach run by using EViews and the results are presented in table 2.

<table>
<thead>
<tr>
<th>Hypothesized No. of CE</th>
<th>Eigenvalue</th>
<th>Trace Statistics</th>
<th>0.5 Critical Value</th>
<th>Prob***</th>
</tr>
</thead>
<tbody>
<tr>
<td>None*</td>
<td>0.2364</td>
<td>24.18721</td>
<td>21.79261</td>
<td>0.0000</td>
</tr>
<tr>
<td>At most 1*</td>
<td>0.3451</td>
<td>11.26121</td>
<td>08.78162</td>
<td>0.0000</td>
</tr>
<tr>
<td>At most 2*</td>
<td>0.4721</td>
<td>74.16309</td>
<td>68.78301</td>
<td>0.0000</td>
</tr>
<tr>
<td>At most 3*</td>
<td>0.5237</td>
<td>42.12671</td>
<td>41.79999</td>
<td>0.0000</td>
</tr>
<tr>
<td>At most 4*</td>
<td>0.4236</td>
<td>17.89012</td>
<td>12.52371</td>
<td>0.0000</td>
</tr>
<tr>
<td>At most 5*</td>
<td>0.2364</td>
<td>04.28091</td>
<td>03.09872</td>
<td>0.0000</td>
</tr>
<tr>
<td>At most 6*</td>
<td>0.1982</td>
<td>06.01728</td>
<td>04.84146</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Granger Causality test are used to test the causality relationship between the variables. The empirical result in the chapter is analyzed by using a multivariate Granger Causality test in order to examine the relation between the variables in this study. Following table will shows the result of the test (Table 3).
Table 3. Granger causality test

<table>
<thead>
<tr>
<th>Excluded</th>
<th>Chi-sq</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RGDP</td>
<td>34.651</td>
<td>0.000</td>
</tr>
<tr>
<td>L-RGDP</td>
<td>20.219</td>
<td>0.000</td>
</tr>
<tr>
<td>Edu</td>
<td>78.236</td>
<td>0.000</td>
</tr>
<tr>
<td>All</td>
<td>133.106</td>
<td>0.000</td>
</tr>
<tr>
<td>Model 13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RGDP</td>
<td>31.721</td>
<td>0.000</td>
</tr>
<tr>
<td>L-edu</td>
<td>17.182</td>
<td>0.000</td>
</tr>
<tr>
<td>Edu</td>
<td>53.236</td>
<td>0.000</td>
</tr>
<tr>
<td>All</td>
<td>102.39</td>
<td>0.000</td>
</tr>
<tr>
<td>Model 14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RGDP</td>
<td>14.613</td>
<td>0.000</td>
</tr>
<tr>
<td>Inf</td>
<td>10.222</td>
<td>0.000</td>
</tr>
<tr>
<td>L-GDP</td>
<td>21.236</td>
<td>0.000</td>
</tr>
<tr>
<td>All</td>
<td>46.071</td>
<td>0.000</td>
</tr>
<tr>
<td>Model 15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RGDP</td>
<td>32.231</td>
<td>0.000</td>
</tr>
<tr>
<td>Inf</td>
<td>12.762</td>
<td>0.000</td>
</tr>
<tr>
<td>L-INF</td>
<td>28.236</td>
<td>0.000</td>
</tr>
<tr>
<td>All</td>
<td>73.229</td>
<td>0.000</td>
</tr>
<tr>
<td>Model 16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RGDP</td>
<td>21.651</td>
<td>0.000</td>
</tr>
<tr>
<td>Expt</td>
<td>17.219</td>
<td>0.000</td>
</tr>
<tr>
<td>L-RGDP</td>
<td>21.236</td>
<td>0.000</td>
</tr>
<tr>
<td>All</td>
<td>60.521</td>
<td>0.000</td>
</tr>
<tr>
<td>Model 17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RGDP</td>
<td>21.023</td>
<td>0.000</td>
</tr>
<tr>
<td>Expt</td>
<td>2.321</td>
<td>0.000</td>
</tr>
<tr>
<td>L-Expt</td>
<td>8.091</td>
<td>0.000</td>
</tr>
<tr>
<td>All</td>
<td>31.435</td>
<td>0.000</td>
</tr>
<tr>
<td>Model 18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RGDP</td>
<td>34.231</td>
<td>0.000</td>
</tr>
<tr>
<td>Crd</td>
<td>20.219</td>
<td>0.000</td>
</tr>
<tr>
<td>L-RGDP</td>
<td>11.226</td>
<td>0.000</td>
</tr>
<tr>
<td>All</td>
<td>65.676</td>
<td>0.000</td>
</tr>
<tr>
<td>Model 19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RGDP</td>
<td>21.644</td>
<td>0.000</td>
</tr>
<tr>
<td>Crd</td>
<td>19.233</td>
<td>0.000</td>
</tr>
<tr>
<td>L-Crd</td>
<td>21.276</td>
<td>0.000</td>
</tr>
<tr>
<td>All</td>
<td>62.153</td>
<td>0.000</td>
</tr>
<tr>
<td>Model 20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RGDP</td>
<td>21.132</td>
<td>0.000</td>
</tr>
<tr>
<td>Employee</td>
<td>20.765</td>
<td>0.000</td>
</tr>
<tr>
<td>L-RGDP</td>
<td>8.321</td>
<td>0.000</td>
</tr>
<tr>
<td>All</td>
<td>50.218</td>
<td>0.000</td>
</tr>
<tr>
<td>Model 21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RGDP</td>
<td>34.261</td>
<td>0.000</td>
</tr>
<tr>
<td>Employee</td>
<td>28.279</td>
<td>0.000</td>
</tr>
<tr>
<td>L-Employee</td>
<td>11.260</td>
<td>0.000</td>
</tr>
<tr>
<td>All</td>
<td>73.800</td>
<td>0.000</td>
</tr>
</tbody>
</table>
This study formulated a simple growth model that used time series data technique to examine the relationship between education, health, employment and economy growth in Thai using Johensen Co Integrated test, Ordinary Least Square model, and the Granger Causality Test. This study attempted to investigate the statistical properties of the explanatory variables within a time series ADF test by using AIC statistic. It is clearly indicated by the AIC empirical results that all the variables of time series data are integrated of order 1. This means that first difference has been taken to make the variables stationary. However, empirical support has been provided by Johensen Co-Integrated test that conintegration exists for the variables with GDP. The OLS results are shown in the table 4 below

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>Model 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>R</strong>^2</td>
<td>0.821</td>
</tr>
<tr>
<td>Edu</td>
<td>0.213***</td>
</tr>
<tr>
<td>Inf</td>
<td>-0.239**</td>
</tr>
<tr>
<td>ExptR</td>
<td>0.321*</td>
</tr>
<tr>
<td>Crd</td>
<td>0.244*</td>
</tr>
<tr>
<td>Employee</td>
<td>0.293*</td>
</tr>
<tr>
<td><strong>R</strong>^2</td>
<td>0.821</td>
</tr>
</tbody>
</table>

Three important findings are extracted from the analysis in accordance to the objectives of this study. Firstly, does the education proxy variable literacy rate have relationship with the economy growth and determine the causality relationship either have direct relationship or not with the economy growth. Secondly, does health proxy variable (infant mortality rate, expectancy life rate and crude death rate) have relationship with the economy growth and also determine the causality relationship between this variable. Finally, the objective, does employment rate have relationship with the economy growth and determine the causality relationship between it.

**Conclusion**

Several important conclusions can be drawn from the study. Firstly, the general objective of this study is to examine the relationship between education, health, employment and economy growth in Thai during the period from 1982 – 2010. The finding of the unit root test on the variables in this study consistent with the result of a number of previous study such as DAI, Delpachitra, Cottrell (2017) and Bedir (2016). The OLS test was conducted to test the relationship and the results shows that the education variables have positive relationship with the economy growth, which means when the economy growth increase, the education or literacy rate in Thai also will increase. Next follow by the health variables, the positive relationship shown by the expectancy life rate with the economy growth. The expectancy rate shows a positive relationship with the GDP due to improvement in health sectors, environment and develop in nutrition due to economy growth extension. Other than that, infant mortality rate and crude death rate variables show a negative relationship with the economy growth. Whereby, when the economy growth keeps increasing, the infant mortality rate and crude death rate will decrease follow through the improvement in health sector and new technology in the medical line. The employment rates show a positive relationship with the economy growth. Positive relationship are shown because the economy growth will increased the government spending and increased the public sector project and training facilities which lead to employment rate increased (Haile & Niño-Zarazúa, 2018). Secondly, this study provides the impact of education, health, employment towards economic growth in Thai. From the result of Johensen Co Integration test, there a strong evidence that all the time series data are in fact co integrated of order one. It means all the independent variable ltc, inf, etc, cdr, and emp and the dependent variables (gdp) are in fact integrated of order one. The result shows that there is long run co integration among this variable. In other words, there long run equilibrium exists among the variables. That means the education, health and employment has a positive impact to the economic growth in Thai.
Thirdly, this study also provides the causality relationship between the variables and the economic growth. The results show that all the variables successful rejected the null hypothesis with economy growth and shows that the variable has direct relationship with the economy growth. In other hand, the results also show that the economy growth does not have direct relationship with the variables. It does can be happen because there is other major policy such as monetary and fiscal policy controlling the economy growth. Overall, the education, health, and employment have relationship with the Thai economy growth. Thus, these variables provide their contribution toward the economic and has impact in the long run. Therefore, the government has play it role in decrease or increase the impact of this variable or either to remain the relationship among the variables in long term, the question which was arise in section 1 and the objective is answered and achieve it.

References


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PRECONDITIONS OF SOCIETY SAFETY THROUGH ENHANCEMENT OF MEDICAL RESPONSIBILITIES: A CASE STUDY

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Abstract. Hospital health services are essentially provided through the use of medication and care. However, medicines are the main cause of undesirable things in hospitals due to the fact that mistakes in prescriptions do not only affect patients but also the reputation of hospitals and health workers. This has, therefore, led to the focus on the problem of responsibility on the part of healthcare providers and the protection of patients. The purpose of this study was to provide information on medication errors, understanding the legal protection of patients after a negative effect and loss, as well as the role of pharmacy and health workers regarding drug prescriptions in hospitals. The results encompassed the forms of criminal, civil and administrative responsibility from pharmacists, nurses, and doctors except for delegate nurses. It further revealed that standard operating procedures are needed, either on drugs or more comprehensive doctor delegation actions, to reduce errors in prescriptions in hospitals. The focus should, therefore, be more on nursing and pharmacist laws. Additionally, provision of training to the various staff members in the hospitals is much necessary as it can increase their learning capabilities and dealing with the drugs in a more responsible way. Such training facility to the human resource of the hospitals can further provide positive outcomes for various industries in public health with entrepreneurial potential. However, the moderating effect of gender between training facilities and industries in public health with entrepreneurial potential can also assumed a tentative contribution in the existing literature too.

Keywords: society safety; health services; medicine/drug, training facility, entrepreneurial potential


JEL Classifications: 01, 016

1. Introduction

Safety of society is dependent on safe administration of medicine, which is one of the most important elements of health care delivery to patients. Therefore, healthcare officers such as pharmacists, nurses and doctors are required to understand the rules and procedures guiding prescription and administration of drugs due to the fact that most instances of errors are associated with these guidelines (Armitage & Knapman, 2003; Dean, Schachter, Vincent, & Barber, 2002). Adequate information about each drug needs to be well understood before it is administered to patients to prevent mistakes, ensure correct medication according to doctor’s instructions, and ensure documentation and monitoring of the effects (Ferner & Aronson, 2006; Hartnell, MacKinnon, Sketris, & Fleming, 2012). This is important considering the serious negative effects of the wrong prescription and administration of medicines.

Medication Error is defined as the harm caused to the patient due to preventable improper handling of prescription and administration of drugs by health workers to the patients (Anacleto, Perini, Rosa, & César, 2005; Van Mil et al., 2016; Williams, 2007). It is one of the most common medical errors with a high rate of morbidity.
leading to death in hospitals. Based on Dwiprahasto (2006), 11% of medication errors in hospitals are related to administration of drugs to patients in the wrong dosage or medication form while National Patient Safety Map report (PERSI Congress 2007) ranked this error the first with 24.8% of the top ten reported incidents. For example, a case of medication error by nurses was observed at Hospital X on February 14, 2012, where a patient aged 3 years was diagnosed in the Jasmine room with a seizure fever. In accordance with the doctor’s instructions, the patient's infusion needed to be replaced with a phenytoin drug drip, but the nurse immediately changed the infusion without following the instruction. A few minutes later, the patient had a seizure, fortunately, the patient’s family reported this incident before it could get worse and the normal thing was performed. This shows the negligence of care has the ability to endanger patient safety.

During the shift of official hours, all nurses have the responsibility to participate in operands aimed at understanding a patient’s condition and the course of actions to follow to avoid an error. However, nurses are responsible for the administration of a safe drug, and it has been discovered that they do not usually administer according to doctor’s orders. It is expected that nurses understand every component of drug administration order and ask questions in situations it seems incomplete or unclear, or when the dosage prescribed is outside the proper limit. It is important to note that there several unidentified and unreported cases of wrong prescription and administration of drugs in hospitals and other healthcare facilities. This makes it important to find a lasting solution to such occurrences due to the negative effects it has on patients, health workers, and the hospital as a whole as well as the assumption that errors in drug administration are common. Therefore, this study was conducted to examine the effect of the responsibility of health workers in medication errors on the patients in hospitals.

Public Health Entrepreneurship (PHE) and Training. The concept of public health entrepreneurship (PHE) has provided a good opportunity for the public health to recognize itself as a growing field (Becker, Chahine, & Shegog, 2019; Jacobson, Wasserman, Wu, & Lauer, 2015; Okuneye, Idowu, & Dansu, 2006; Panfiluk & Szymańska, 2017). In order to meet the contemporary market demands, it is obvious for different community members to understand, learn and differentiate between the various type of skills which can be marketed to proposed employers (Bennett, 2002). PHE is defined under the shadow of social entrepreneurship which has attained significant attention in the recent decades (Green, 2012). Social entrepreneurs play their role in the society as change agent through set of the activities (Abu-Saifan, 2012; Bacq & Janssen, 2011; Santos, 2012). Their roles are under the title of adopting a social mission to create values (Sullivan Mort, Weerawardena, & Carnegie, 2003), recognition of new opportunities (Lehner & Kansikas, 2012; Yitshaki & Kropp, 2016), engaging themselves in the process of continuous innovation (Carraher, 2013), acting in a bold way, and finally the exhibition of heightened sense of accountability (Hernández, Carrión, Perotte, & Fullilove, 2014). As a nascent field, social entrepreneurship has covered variety of fields including education, development of the workforce, micro-financing, and health sector too (Fortunato, 2014; Short, Moss, & Lumpkin, 2009; Zahra & Wright, 2016). Health is primarily observed as inherent factor in the society, but PHE captures those enterprises which are rooted in the health protection, disease prevention and other health care facilities (Evans, Barer, & Marmor, 1994). In the literature of PHE, various fields and entrepreneurial ventures are emerged to promote the public health enterprise. Some of the emerging industries which are related to PHE potentials are depicted in the figure 1 below.
In developed economies like the United States, PHE is significantly helping to provide the answer for the various challenges of health (Ross, 2017). It is believed that entrepreneurship is a powerful source which can direct to work for the better community health. However, government public health budgets are constrained by the variety of economic factors (Ross, 2017). In addition, training facility for the public health entrepreneurial can serve as an incubator for public health innovation (Ostrovsky & Barnett, 2014; Séguin, Hardy, Singer, & Daar, 2008; Tonukari, 2008). For this purpose, series of course areas have been highlighted in the literature covering the cross-disciplinary curriculum for training in PHE. These are under the title of legal and regulatory structure which gain awareness for both individual and community benefit of the PHE and ethical consideration for the earning from disease vs. health (Becker et al., 2019).

In addition, the training need for the employees either working in the service industry or any other sector is widely accepted and discussed in the literature. However, focus on the medical field by the researcher for the proper training of the human resource is discussed in a context of pediatric disaster victims (Behar, Upperman, Ramirez, Dorey, & Nager, 2008), advance trauma life support training for medical staff (Jayaraman, Sethi, Chinnock, & Wong, 2014), training for the spiritual care of the patients (van de Geer et al., 2018), prevention from the suicide and related training programs (Nakagami et al., 2018), emergency news delivery training by the medical staff (Dekker-Boersema et al., 2019), and provision of advance cardiac life support training programs (Chang, Chang, Hwang, & Kuo, 2018). Meanwhile, public health conceptual framework discusses the points to situate the factor of health into broader structure. Based on the above discussion, this study has two main intentions. The study first intention is to theoretically conduct a discussion over medical obligations of various health staff regarding prescriptions of drugs and related laws. In the second step, this study has intended to investigate the influence of training needs on PHE potential industries. The rest of the paper is organized as follows: methods, theoretical discussion, empirical findings, and conclusion. The methods cover the overall perspective of the study, sample being observed and techniques of data analysis, while discussion is covered mainly under two subtitles. Lastly, conclusion of the study is provided.

2. Methods

This study has contributed in the existing literature in two perspective. At first some significant theoretical discussion is conducted regarding the standards for the pharmaceutical services in administrating the medicines, responsibility for nursing errors in hospitals along with doctor’s liability. In the second phase, a survey questionnaire was developed in order to provide further insight into the field of public health, related industries and the influence of training facility on them. The questionnaire was proposed based on the 12 items of training facilities for the medical staff in the hospitals and four industries having entrepreneurial potentials like education.
and social service, environmental service, fitness and recreation, and holistic health etc. The questionnaire was distributed to various staff members in the hospitals as they are deemed a relevant sample due to nature of the problem and research objective of the study. Medical staff was requested to fill the questionnaire during their working period and data was collected for the empirical analysis through SPSS 22, considering a likert scale from 1 to 5. A final sample of 112 respondents was collected from the medical staff (details are provided in the subsequent section). Although the collected sample is found to be very limited yet literature support is reasonably available for the limited sample size as observed in the research findings of (Chen, Yao, & Kotha, 2009; Krueger Jr, Reilly, & Carsrud, 2000; Ozdemir, Dabic, & Daim, 2019). Besides, respondent profile is examined through age, gender, working experience, and employment criteria too.

3. Theoretical discussion

The hospital is a health care institution that provides proper individual health care delivery through inpatient, outpatient, and emergency services (Permana, 2016). Implementation of health efforts needs to be conducted by responsible health workers with high ethics and morals, expertise, and an authority that requires improvement through continuous education and training, certification, registration, licensing, as well as guidance, supervision, and monitoring (Bastable, 2017; Brauer, 2016). This is needed to fulfill a sense of justice and humanity in accordance with the development of health science and technology (Permana, 2016). However, implementing health care services in the hospital is very complex considering the differences among the workers and the interaction of knowledge (Siswati, 2013). During the process of providing health services, there is a need to prioritize medical and non-discriminatory indications in the best interests of the patient and accordance with medical indications (Askitopoulou, Singler, Frühwald, & Weissendenberger-Leduc, 2018; Priestman et al., 2019). Moreover, health personnel need to meet the provisions of the code of ethics regulated by producer organizations, professional standards, the rights of users of health services, service standards, and standard operating procedures. Grammatically and juridically, there is a difference regarding the understanding of health workers according to the Kamus Besar Bahasa Indonesia. From the grammatical perspective, the term “workers” means people that work or do something while “health” relates these workers to the medical field. Therefore, health workers are grammatically workers or human resources in the medical field. From the legal perspective, Law Number 44 the Year 2009 concerning Hospitals defines health workers as part of the permanent human resources of hospitals and they include medical staff, consisting of medical doctors and certain medical personnel, medical support, nursing staff, pharmaceutical Workers, hospital management personnel, and non-health workers. However, this research focused on the roles of doctors, nurses, and pharmacists concerning the errors in administering medication in hospitals as main respondents.

The pharmaceutical service standards to assess a pharmacist’s negligence in providing drugs include that pharmacists must understand and be aware of medication errors in the service process (Horn, 2019; Rocha et al., 2019). Additionally, pharmacists need to identify, prevent and overcome drug-related economic, social, and pharmacy problems; and pharmacists are required to improve knowledge, skills, and behavior in conducting direct interactions such as the provision of drug information and counseling to patients in need. With specific attention to the provision of drugs, pharmaceutical service standards also known as clinical pharmacy services, are direct services provided by pharmacists to patients in rayat to improve therapeutic outcomes and minimize the risk of drug side effects and ascertain the patient’s quality of life is guaranteed (Drovandi et al., 2018; Forsyth et al., 2019; Penna, 1990). These services include:

1) Assessment and prescription
Prescription services start from receipt, checking availability, prescription review, preparation of pharmaceuticals, medical devices, and consumable medical materials including drug compounding, checking, and provision of information. Every stage of prescription service is required to prevent medication errors.

2) History of drug use
It is a process of obtaining information about all other pharmaceuticals/drugs that have been and are being used from interviews or medical record data of drug use from patients.
3) Drug Information Services (PIO). These are activities directed towards providing independent, accurate, current, and comprehensive information and recommendations by pharmacists to doctors, nurses, other health professionals, as well as patients and other parties outside the hospital.

4) Counseling
This is an activity involving the provision of advice or suggestions related to drug therapy by a pharmacist or counselor to patients or their families. Counseling for outpatients and inpatients is conducted based on a pharmacist’s or doctor’s referral or the patient’s or family’s wishes.

5) Monitoring drug therapy (PTO)
Drug therapy monitoring (PTO) includes activities to ensure safe, effective, and rational therapy for patients.

6) Monitoring of Drug Side Effects (MESO) is the activity of monitoring any response to unwanted drugs occurring at normal doses used in humans for prophylactic, diagnostic and therapeutic purposes.

The word “responsibility” means a condition where an individual or organization as accepted to be blamed, sued, and responsible for certain actions. It was further defined as a state of competence or ability to think effectively according to the law as well as the ability of a person or legal entity to bear the obligation or the burden thereof to everything or every deed. Fockema Andreae as quoted by Arifin P. Soeria defined responsibility as the obligation to assume responsibility and loss if prosecuted related to law and administration (Atmadja, 1983). In English, the term is defined in two ways, responsibility and liability. Responsibility is defined as being responsible for the action towards oneself while liability is interpreted as being responsible for actions towards others and translated as legal accountability in Indonesian language. According to Black’s Law Dictionary, liability has three meaning and they include:

a. Related obligation in law or justice to do something;
b. The condition of being liable for loss or actual damage;
c. Conditions to conduct duties to take immediate or future actions.

Liability is further explained as a situation where the error or negligence of an individual causes harm to others with the affected person having the right to claim compensation and the individual that caused taking responsibility for the consequence (Sudikno, 2005).

Moreover, liability can also be referred to as a legal obligation to bear the consequences of mistakes made by legal subjects while responsibility refers to political and moral liability. The legal liability has three parts and they include criminal law, administrative law, and civil law, which is often referred to as responsibility. Basically, civil law liability aims to ensure patients receive compensation, in addition to being preventive to avoid undesirable things.

Responsibility for Nursing Error in Hospitals. The provision of drugs or medication is an important element in efforts to cure disease and restore health. Nurses are responsible for ensuring the administration of the drug is safe for patients and also required to be equipped with nursing knowledge (Law No. 23 of 1992 article 32 paragraph (3). In administering safe drugs, attention is required to be paid on five rights which include the right patient, right drug, right dose, right time and right route and each of these requires special nursing knowledge, skills, and actions (NOGA, 1992). Moreover, (Damico et al., 2018; Gaikwad et al., 2018; Schwartz, Lima, Clark, & Miller, 2019) also revealed the rights that are also important in professional nursing practice to include the right assessment, right documentation, client’s right to get an education, right evaluation, and client’s right to refuse medication. The authors further highlighted various accuracies required by nurses together with proper documentation to achieve legal accountability. These are especially needed by inpatients treated in the hospital room and where the nurse is required to administer a variety of drugs to several different patients. Therefore, to avoid errors in drug administration, nurses need to apply the principle of “six right”.

Nursing care aims to improve the health conditions of patients (Strandås & Bondas, 2018). However, there are situations the opposite is observed where the patient’s condition worsens due to the activities of the nurses lead-
ing to disability, or, to the extreme, death. The provision of health care in the hospital is directly related to the patient and in certain cases other health professionals. This direct relationship means there is continuous direct interaction between the nurse and the patients and their families. From a legal perspective, there are two aspects of the nurse’s relationship with the patient. The first is the material and real aspect which involves nurses agreeing with patients on the nursing action plan to be conducted while the second is formal with the nurse operating as a hospital employee and the patient is entitled to receive nursing care (Strandås & Bondas, 2018).

According to Law No. 38 of 2014 concerning Nursing, nurses are given the authority to make health efforts in accordance with their expertise. They are expected to prioritize the interests of patients by providing services in accordance with professional standards, operational procedures standards, nursing care standards, regulations in the workplace, and the nursing code of ethics. Moreover, they need to be responsible for themselves, their profession, and society both through the nursing actions undertaken (responsibility) and accountability (liability). Responsibility means the willingness to accept the risk of unlawful acts and incur a criminal loss while liability means the willingness to compensate for damages arising from acts that violate civil law.

The responsibility for the occurrence of nursing errors needs to be linked to the nurse’s action category. According to Sofwan Dahlan, the actions of nurses working in hospitals are divided into caring, technical, and delegated medical activities (Dahlan, 2000). Caring activities encompass the legal responsibility of nurses including decisions made and the execution of those decisions. Technical activities involve the implementation of a doctor’s decision, based on verbal orders, fixed procedures (SOPs), and existing Standard Operating Procedures (SOPs) while delegated medical activities are part of the medical authority delegated to nurses. In this case, the nurse is not legally responsible, both regarding the decision and the implementation as stated in Article 32 paragraph (1) - (6) of Law No. 38 of 2014 concerning Nursing and revealed as follows:

1. Execution of tasks based on delegation of authority with reference to Article 29 paragraph (1) letter e can only be given in writing by medical personnel to nurses to conduct medical actions and evaluate their implementation.
2. Delegation of authority as referred to in paragraph (1) can be delegated or mandated.
3. Delegative delegation of authority to take medical action is given to nurses by medical personnel.
4. Delegative delegation of authority according to paragraph (3) can only be given to professional nurses or competent vocational nurses.
5. Mandated delegation of authority is given by medical personnel to nurses to conduct medical actions under supervision.
6. The responsibility for medical actions on the delegation of authority according to paragraph (5) is based on the authority grantor.

Doctor’s Liability. In law, there are three elements of a doctor’s liability in treating patients and they include: negligence to blame or culpability, losses or damages, and causal relationship. A doctor makes a mistake or considered negligent if the action conducted is careless, ignorant of the interests of others, and not in accordance with professional standards. This I, however, measured through the fulfillment of the previously mentioned three elements and the inability to fulfill one of them excuse the doctor from the blame and can be legally acquitted of all charges. It is also important to state that not every loss due to medical treatment is the doctor’s responsibility, some are attributed to the hospital as well as the patients.

The responsibilities of medical professional are categorized into ethical and legal. As previously stated, the legal responsibilities can further be divided into administrative, civil, and criminal laws. Civil liability usually arises due to the legal relationship between doctor and patient, through the therapeutic agreement. Basically, it is in the form of engagement, and the contract defaults if there is non-adherence to the content of the agreement and the doctors can be prosecuted for acts against the law due to violations of statutory provisions and sense of propriety, accuracy, and caution based on the legal obligations. Moreover, the most important thing to determine whether a doctor’s action is against the law or default is the optimal effort in conducting health services or medical treatment for patients. According to Article 1320, the third requirement cannot be fulfilled due to the
fact that the object of engagement between the patient’s doctor is in the effort of the doctor to heal the patient carefully despite the tension (nspanningverbintenis), therefore, this article cannot be applied in an agreement between a doctor and the patient.

Article 24 paragraph (1) of Law Number 36 Year 2009 concerning Health shows the determination of the effective conduct of doctor’s duties by stating that “health workers in conducting their duties must fulfill the provisions of the code of ethics, professional standards, rights health service users, service standards, and standard operating procedures”. Meanwhile, Article 44 paragraph (1) of Law number 29 of 2004 concerning Medical practice also states that doctors, in conducting medical practices, are required to follow medical service standards.

The legal responsibilities of doctors in criminal law arise when there are certain medical errors. The parameters to assess the alleged violation of criminal law according to Indriyanto Seno Adjio cited Oemar Seno Adji’s opinion include

1) The existence of zorgvuldigheid (accuracy) shows a doctor has the normal ability with a reasonable relationship to treat patients.

2) The existence of diagnosis and therapy shows these actions are conducted by the doctors depending on their knowledge, abilities, and experience. In a situation the diagnosis is influenced by the position, development, and state of medical science, the therapy is also affected by several factors such as psychological, psychosocial, and compilation conditions without prior calculation.

3) Professional standards, in the form of a) average ability, b) category and condition, c) fulfillment of the principle of proportionality and subsidiarity to conduct medical measures.

Therefore, if there is a failure or death of a patient due to medical services performed by a doctor, it can first be proven that there is a causal relationship or cause and effect between the doctor’s medical actions and the patient’s injury or death. It is, however, usually important to distinguish between cause in fact and proximate cause. The first problem is, the doctor’s actions cause harm, death/injury, to the patient while the second problem is that the limits of the doctors’ responsibility are related to the consequences of their actions. From the explanation of the criminal acts and liability, cases of errors which result in fatalities from doctors may be subjected to criminal prosecution based on several applicable laws and regulations either the general ones (lex generalis) like the Criminal Code or those contained in special laws (lex specialists) as in Law Number 36 Year 2009 concerning Health Principles and Law Number 29 Year 2004 on Medical Practice.

4. Research Findings and Discussion

This section covers the empirical findings and relevant discussion for the relationship between training facilities and its impact on Respondent’s details are provided under Table 1 and Table 2 through cross tabulation for the experience, age and gender factors. It shows that overall 78 male and 34 female members are covering the sample portion of this research, where 8 male members are in age range of 20-25, and 26-30 years with all type of working experience, 20 in age range of 31-35 years, 22 in range of 36-40 years, and 20 are above 40 years of age with maximum 11 members having working experience of 6-8 years respectively. In terms of female respondents, cross tabulation expresses that only 4 females are in age range of 20-25 years, 3 are in range of 26-30 years, 10 are in range of 31-35 years, 13 females are in age range of 36-40 years and only 4 female respondents are above 40 years of age. In terms of working experience, maximum 13 females have a working experience of 5-6 years in their relative field, followed by 10 females with the experience of 6-8 years respectively. Figure 2 below provides a good view for both the gender profiles as expressed through age and working experience.
Table 1. Respondent Profile Through Cross Tabulation of Experience, Age, and Gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>Experience</th>
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</thead>
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<tr>
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<td>3-4 years</td>
</tr>
<tr>
<td>Male</td>
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<tr>
<td>Age</td>
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<td></td>
<td>20-25 Years</td>
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<tr>
<td></td>
<td>26-30 Years</td>
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<tr>
<td></td>
<td>31-35 Years</td>
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</tr>
<tr>
<td></td>
<td>36-40 Years</td>
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<td></td>
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</tr>
<tr>
<td>Total</td>
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<td>10</td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>Age</td>
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<td></td>
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<tr>
<td></td>
<td>20-25 Years</td>
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<tr>
<td></td>
<td>26-30 Years</td>
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<tr>
<td></td>
<td>31-35 Years</td>
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<tr>
<td></td>
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<td></td>
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<td>Total</td>
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<tr>
<td>Total</td>
<td>7</td>
<td>14</td>
</tr>
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</table>

Figure 2. Demographic Details in Terms of Age, Working Experience and Gender

Table 2 considers the demographic details as expressed through employment criteria (full time, part time) with the age and working experience in years. It is found that respondents with full time working profile are 53 with the experience of all type of categories. In terms of part time, 59 respondents are observed, out of which 22 members having work experience of 5-6 years, 11 with 6-8 years, and 13 have a working experience of 9 years and above. Figure 2 describes the cross tabulation for experience, age and employment criteria.

Table 2. Respondent Profile Through Cross Tabulation of Experience, Age, and Employment Criteria

<table>
<thead>
<tr>
<th>Employment</th>
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<th>Total</th>
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</thead>
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<tr>
<td></td>
<td>1-2 years</td>
<td>3-4 years</td>
</tr>
<tr>
<td>Full Time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-25 Years</td>
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<td>1</td>
</tr>
<tr>
<td>26-30 Years</td>
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<td>3</td>
</tr>
<tr>
<td>31-35 Years</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>36-40 Years</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>above 40 Years</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Part Time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
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<td>4</td>
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<tr>
<td>31-35 Years</td>
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<td>36-40 Years</td>
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<td>0</td>
</tr>
<tr>
<td>above 40 Years</td>
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<tr>
<td>Total</td>
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<tr>
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</table>

Figure 3. Demographic Details in Terms of Age, Working Experience and Employment Criteria
After the demographic analysis, it was deemed necessary to further investigate the effect of EHP training items on various industries as related to public health and entrepreneurship potentials too. For this purpose, overall four industries under the title of education and social services (ESS), environmental services (Eserv), fitness and recreation (FitRec), and holistic health (HolHealth) accordingly. All these fields are extracted from the literature contribution of (Hernández et al., 2014), who focused on public health entrepreneurs. For EHP training, overall 12 items were extracted from the literature and adapted for the present study. It is observed that focusing training course in achieving individual objectives can positively and significantly influence on ESS, FitRec and HolHealth, significant at 5 percent. Whereas the 2nd item of EHP training is found to be insignificant for all four categories of industries related to public health having entrepreneurial potential, except for FitRec. This would imply that for more the understanding of the training course through participation, positive the influence on fitness and recreation sector of public health will be. Furthermore, provision of educational and learning environment to the respondents in health sector can increase the participation in ESS and FitRec accordingly. In addition, with the more potential pathway for implementing the health care services as observed through PHE training facilities, there is a significant and positive impact on ESS, and FitRec (i.e. coefficients are .150, and .103, significant at 5 percent). Meanwhile, TNF9 indicates a positive and highly significant impact on educational and social services. While the effect of PHE training programs in removing the errors for administering the drugs is positively significant for all four categories of Industries relevant to public health with entrepreneurial potential.

Table 3. EHP Training and Its Influence on selected industries relevant to public health with entrepreneurial potential

<table>
<thead>
<tr>
<th>EHP Training Items</th>
<th>DV: ESS Beta</th>
<th>Sig.</th>
<th>DV: Eserv Beta</th>
<th>Sig.</th>
<th>DV: FitRec Beta</th>
<th>Sig.</th>
<th>DV: HolHealth Beta</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>.152</td>
<td>.905</td>
<td>.629</td>
<td>.352</td>
<td>.367</td>
<td>.426</td>
<td>.968</td>
<td>.093</td>
</tr>
<tr>
<td>TNF1: Training Course can help me to achieve my individual objectives</td>
<td>.120***</td>
<td>0.000</td>
<td>.143</td>
<td>.255</td>
<td>.210**</td>
<td>.001</td>
<td>.257**</td>
<td>.032</td>
</tr>
<tr>
<td>TNF2: I can acquire a deeper understanding of the Training Course subject by participating therein</td>
<td>-.188</td>
<td>.035</td>
<td>.067</td>
<td>.560</td>
<td>.144***</td>
<td>.000</td>
<td>-.091</td>
<td>.406</td>
</tr>
<tr>
<td>TNF3: My performance level will rise as a result of my attendance to the training course as professional health entrepreneur</td>
<td>.124</td>
<td>.158</td>
<td>-.027</td>
<td>.808</td>
<td>-.147</td>
<td>.108</td>
<td>.030</td>
<td>.778</td>
</tr>
<tr>
<td>TNF4: Training course can Create an appropriate educational and learning environment for me</td>
<td>.028***</td>
<td>0.002</td>
<td>.113</td>
<td>.230</td>
<td>.019***</td>
<td>.003</td>
<td>.110</td>
<td>.242</td>
</tr>
<tr>
<td>TNF5: Training program can increase my learning for the self-administration of the medicines</td>
<td>.018</td>
<td>.832</td>
<td>.005</td>
<td>.964</td>
<td>.084</td>
<td>.349</td>
<td>.001</td>
<td>.994</td>
</tr>
<tr>
<td>TNF6: Training program can provide Adequate information about each drug needs to be well understood</td>
<td>-.002</td>
<td>.983</td>
<td>.180</td>
<td>.067</td>
<td>.036</td>
<td>.666</td>
<td>-.052</td>
<td>.595</td>
</tr>
<tr>
<td>TNF7: Public health entrepreneurship (PHE) training provides a potential pathway for implementing health care services.</td>
<td>.150***</td>
<td>0.000</td>
<td>.098</td>
<td>.120</td>
<td>.103**</td>
<td>.018</td>
<td>.070</td>
<td>.571</td>
</tr>
<tr>
<td>TNF8: PHE training requires a unique skillset to advance public health.</td>
<td>.214</td>
<td>.011</td>
<td>.036</td>
<td>.706</td>
<td>.059</td>
<td>.492</td>
<td>-.102</td>
<td>.320</td>
</tr>
<tr>
<td>TNF9: PHE training presents an opportunity for inter-professional collaboration.</td>
<td>.275***</td>
<td>0.005</td>
<td>.016</td>
<td>.916</td>
<td>.123</td>
<td>.225</td>
<td>.147</td>
<td>.222</td>
</tr>
<tr>
<td>TNF10: For proper learning of permanent human resources of hospitals, PHE training is compulsory.</td>
<td>.045</td>
<td>.646</td>
<td>.150***</td>
<td>.006</td>
<td>.037</td>
<td>.713</td>
<td>.018***</td>
<td>.000</td>
</tr>
<tr>
<td>TNF11: PHE training can help in lowering the Nursing Error in Hospitals</td>
<td>.098</td>
<td>.314</td>
<td>.040</td>
<td>.767</td>
<td>.319</td>
<td>.002</td>
<td>.252</td>
<td>.039</td>
</tr>
<tr>
<td>TNF12: Errors in administering drugs can also be eliminated through PHE training programs.</td>
<td>.492***</td>
<td>0.000</td>
<td>.430***</td>
<td>.004</td>
<td>.382***</td>
<td>.000</td>
<td>.273**</td>
<td>.021</td>
</tr>
</tbody>
</table>

After the direct influence of EHP training items on selected industries of public health with entrepreneurial potential, Table 4 exemplifies the interaction effect of gender between TNF and selected industries. It shows that interaction of gender with TNF2 is positively and significantly impacting on ESS, Eserv, FitRec, and HolHealth of the patients. This effect would further express that gender presence as a moderator between acquiring a deeper understanding of the Training Course subject by participating therein or TNF2 and all four industries, positive influence is observed. Additionally, the interaction effect of TNF8 with gender is found to be positively
significant for ESS, FitRec, and HolHealth with their relative coefficients of .389, .022, and .263 respectively. Lastly, the moderating effect of gender between TNF11-ESS, TNF11-FitRec, TNF11-HolHealth, and between TNF12-ESS is highly significant and positive, implying that more the gender influence on the training programs, productive the relationship between these training items and some industries with entrepreneurial potential in public health.

Table 4. Moderating effect of Gender on EHP Training and Selected Industries Relevant to Public Health with Entrepreneurial Potential

<table>
<thead>
<tr>
<th>EHP Training items and Gender Interaction</th>
<th>DV: ESS</th>
<th>DV: Eserv</th>
<th>DV: FitRec</th>
<th>DV: HolHealth</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>0.697</td>
<td>.000</td>
<td>3.300</td>
<td>.000</td>
</tr>
<tr>
<td>TNF1*Gender</td>
<td>-.077</td>
<td>.603</td>
<td>.029</td>
<td>.863</td>
</tr>
<tr>
<td>TNF2*Gender</td>
<td>.283***</td>
<td>.043</td>
<td>.114*</td>
<td>.065</td>
</tr>
<tr>
<td>TNF3*Gender</td>
<td>.106</td>
<td>.467</td>
<td>.086</td>
<td>.601</td>
</tr>
<tr>
<td>TNF4*Gender</td>
<td>.047</td>
<td>.713</td>
<td>.204</td>
<td>.156</td>
</tr>
<tr>
<td>TNF5*Gender</td>
<td>.063</td>
<td>.661</td>
<td>.088</td>
<td>.584</td>
</tr>
<tr>
<td>TNF6*Gender</td>
<td>.115</td>
<td>.362</td>
<td>.170</td>
<td>.230</td>
</tr>
<tr>
<td>TNF7*Gender</td>
<td>.255*</td>
<td>.089</td>
<td>.054</td>
<td>.745</td>
</tr>
<tr>
<td>TNF8*Gender</td>
<td>.389***</td>
<td>.008</td>
<td>.023</td>
<td>.886</td>
</tr>
<tr>
<td>TNF9*Gender</td>
<td>.221</td>
<td>.283</td>
<td>.159</td>
<td>.492</td>
</tr>
<tr>
<td>TNF10*Gender</td>
<td>.023</td>
<td>.916</td>
<td>.064</td>
<td>.796</td>
</tr>
<tr>
<td>TNF11*Gender</td>
<td>.589**</td>
<td>.032</td>
<td>.109</td>
<td>.622</td>
</tr>
<tr>
<td>TNF12*Gender</td>
<td>.471***</td>
<td>.009</td>
<td>.236</td>
<td>.238</td>
</tr>
</tbody>
</table>

Note. TNF*Gender shows interaction Term,

4. Conclusion

Errors in administering drugs by health workers are contained in three legal aspects including civil, criminal, and administrative laws. However, fatal errors may lead to criminal prosecution based on several applicable laws and regulations either the general ones (lex generalis) or special laws (lex specialists) as in Law Number 36 the Year 2009 and Law Number 29 the Year 2004. Meanwhile, the nurse’s responsibility is associated with nurses’ actions in the hospital as well as delegation according to Article 32 paragraph (1) - (6) of the Nursing Act. This study has theoretically discussed the context of medical responsibilities of the prescription of the drugs and its effect on the patents. For this purpose, significant discussion is made regarding who are the health workers, what are their prime obligations, and who are the key parties under the title of medical workers. Additionally, various standards for the pharmaceutical services in administering the medicine with the legal liability of the staff and responsibility for the nursing errors in the hospitals along with doctor’s liability are reasonably discussed under present research. In the second part of the research, empirical findings are presented covering the title of training factors and their influence on the Industries relevant to public health with entrepreneurial potential. For the respondent’s profile, demographic factors are also discussed through cross tabulation method, covering the title of age, gender, working experience, and employment profile too. Additionally, regression findings show that there is a significant and positive influence of selected items of training facilities on various industries of public health having entrepreneurial potentials. Furthermore, moderating effect of gender between training and public health industries with entrepreneurial potentials is also tested and presented. Findings explains that gender factor is significantly moderating the relationship of TNF2, TNF8, TNF11, and TNF12 with selected industries. Based on the study theoretical discussion and empirical contribution, this research has untapped the discipline of entrepreneurship in the field of medical sciences under the shadow of training needs and their relationship with public health industries too. As literature context is widely providing the support for the entrepreneurial context for the business students, however, significant gap is yet to be covered in other fields like medical law and public health sectors as well. In this way, this research is a novel contribution both
theoretically and practically to explore the relationship of training facilities and relevant industries of public health having entrepreneurial potentials. The results of this research have provided a good evidence for the significance of training need for the medical workers, working in hospitals which may increase their learning and understanding of the drugs too.

References


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CONTENTS

VOLUME 9 NUMBER 2 DECEMBER 2019

Jānis Teivāns-Treinovskis, Margarita Nesterova, Sergey B. Shechepanskiy, Marina Proshina.
IMPACT OF LEGAL REGULATION OF WEAPON TURNOVER ON PUBLIC AND NATIONAL SECURITY 367

Tadas Limba, Andrius Stankevičius, Antanas Andrulevičius.
TOWARDS SUSTAINABLE CRYPTOCURRENCY: RISK MITIGATIONS FROM A PERSPECTIVE OF NATIONAL SECURITY 375

Somdech Rungsrisawat, Kittisak Jermsittiparsert, Sattapas Thanetpaksapong.
DO THE CRIME AND THE SOCIOECONOMIC STRAIN AFFECT THE ECONOMIC GROWTH? A CASE OF AN EMERGING ASEAN ECONOMY 391

Zenona Ona Atkociūnienė, Olga Miroshnychenko.
TOWARDS SUSTAINABLE DEVELOPMENT: THE ROLE OF R&D SPILLOVERS IN INNOVATION DEVELOPMENT 409

Perizat Beisekova.
CLUSTER FUNCTIONING AS A DIRECTION OF SUSTAINABLE TERRITORIAL - INDUSTRIAL PARTNERSHIP 421

Marina Widiyanti, Ernie Hendrawaty, Djawoto.
ANTECEDENTS OF ECONOMIC CONVERGENCE IN ASEAN COUNTRIES: FOREIGN DIRECT INVESTMENT, TRADE, GOVERNMENT SIZE, POPULATION AND ECONOMIC CONVERGENCE 431

Yelena Petrenko, Elena Vechkinzova, Lyussiya Togalbayeva.
DEVELOPMENT OF CREATIVE CLUSTERS OF A POLICULTURAL REGION: CHALLENGES FOR GOVERNANCE 447

Liubov Lehoux, Hermann Duck, Ravil Akhmadeev, Tatiana Morozova, Olga Bykanova.
SUSTAINABLE DEVELOPMENT FACETS: TAXATION SOLUTIONS FOR THE ENERGY INDUSTRY 457

Isfenti Sadalia, Nisrul Irawati, Masyhuri Hamidi, Girati, Saadah Yuliana.
HOW THE FINANCIAL OPENNESS ACCELERATES THE ECONOMIC GROWTH OF LEADING ASEAN ECONOMIES 473

DOES THE ELECTRICITY CONSUMPTION DETERMINE THE ECONOMIC GROWTH AND ENERGY PRICES IN ASEAN COUNTRIES? 489

Radomir Ščurek, Věra Holubová.
THE PHYSICAL SECURITY OF BUILDINGS OF PUBLIC UNIVERSITIES 505

Muhadjir Anwar, Effed Darta, Marlina Widiyanti, Hendri Soekotjo
HOW THE CURRENCY CRISIS EFFECTS THE RELATIONSHIP BETWEEN FINANCIAL INFLOWS AND ECONOMIC GROWTH IN ASEAN COUNTRY 517

Sakapas Saengchai, Chanathat Boonrattanakittibhumi, Buppachart Urairak.
INSIGHTS INTO THE EXTERNAL DEBT, CORRUPTION AND ECONOMIC GROWTH NEXUS: A CASE STUDY 533

Svetlana Drobyazko, Iryna Alieksieienko, Maryna Kobets, Elena Kiselyova, Mykola Lohvenko.
TRANSNATIONALIZATION AND SEGMENT SECURITY OF THE INTERNATIONAL LABOR MARKET 547

Aleksy Kwikinski, Volodymyr Tkachenko, Aleksandra Kuzior.
TRANSPARENT COGNITIVE TECHNOLOGIES TO ENSURE SUSTAINABLE SOCIETY DEVELOPMENT 561

Kittisak Jermsittiparsert, Sakapas Saengchai, Chanathat Boonrattanakittibhumi, Thitinan Chankoson.
THE IMPACT OF GOVERNMENT EXPENDITURES, GROSS CAPITAL FORMATION, TRADE, AND PORTFOLIO INVESTMENT ON THE ECONOMIC GROWTH OF ASEAN ECONOMIES 571

Alona I. Boiarchuk, Vera N. Fomishyna, Ruslan P. Ohorodynyk.
REDICTING PLAUSIBLE THREATS: IMPACT OF GLOBALIZATION PATTERNS ON NATIONAL ECONOMIES 585

Marcin Jurgilewicz, Krystyna Kmiotek, Robert Dankiewicz, Andrzej Misuik.
MEDIATION IN CIVIL MATTERS AS AN EXAMPLE OF THE METHOD USED IN LEGAL SECURITY MANAGEMENT AND OPTIMIZATION OF COSTS OF PROCEEDINGS 595

Marko Roško, Marijana Musladin, Rastislav Kazanský.
COUNTER-TERORISM IN THE UNITED KINGDOM: SUSTAINABLE MEASURE OR VIOLATION OF HUMAN RIGHTS 603

Piotr Siemiątkowski, Patryk Tomaszewski Oktawia Jurgilewicz.
ASSESSMENT OF BASIC ELEMENTS OF THE SECURITY SYSTEM OF LOCAL COMMUNITIES 617

Artém Krasnov, Bakyt Beknazarov, Dinara Jarikbayeva, Dinara Veshpanova, Alma Karshalova.
SECURITY OF THE EURASIAN ECONOMIC UNION MEMBER STATES: SOCIOECONOMIC AND FINANCIAL ASPECTS 637

Tran Thi Bich Ngoc, Galina Anzelmovna Barysheva, Tran Duc Trung.
INDUSTRIAL ZONE DEVELOPMENT AND INTERNAL MIGRATION ISSUE IN VIETNAM: EVIDENCE FROM BINH DUONG PROVINCE 649

Sudawan Somjai, Saroea Vasunich, Akarapittta Meechaiwong, Watcharin Joemsittiparsert.
Sustainable Development Facets: Does Sovereign Debt Accelerate the Economic Growth? A Case Study in Latvian Municipalities 663

Phatthanan Hiranrithikorn, Chayongkan Pamornmast.
DOES TRANSPORT INFRASTRUCTURE FOSTERS THE ECONOMIC GROWTH: AN ASEAN PERSPECTIVE 689

Somdech Rungsrisawat, Chayongkan Pamornmast.
DOES THE EDUCATION, HEALTH AND EMPLOYMENT DETERMINE THE ECONOMIC GROWTH: A CASE STUDY 701

Sutarno.
PRECONDITIONS OF SOCIETY SAFETY THOUGH ENHANCEMENT OF MEDICAL RESPONSIBILITIES: A CASE STUDY 715

Sudawan Somjai, Saroea Vasunich, Akarapittta Meechaiwong, Watcharin Joemsittiparsert.
Sustainable Development Facets: Does Sovereign Debt Accelerate the Economic Growth? A Case Study in Latvian Municipalities 663