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ORGANIZATIONAL COMPETENCE OF NATO INFORMATION SECURITY POLICY

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Abstract. The science article is dedicated to the actual problem reinforcement and reformation the system of information security in counties that relate to the North Atlantic Treaty Organization. The main threatens to country’s information security has been defined, the analytical grouping of problems by level of complexity and prognostication calamity have been made. The process algorithm for ensuring eternal operation of the information security system under the pressure of information threaten was elaborated. The critical components of NATO information infrastructure was well-defined.

Keywords: NATO; the information system; the information infrastructure; the information security system; interstate conflicts; national security; international cooperation

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1. Introduction

In today’s conditions of distribution of political and military forces in the world, taking into account the construction of the information society, the actuality of organization the information security is raising - prevention and elimination by various means and methods of threats to the person, society, the state in the information sphere become more and more urgent. However, in today’s multifaceted and dynamic world, information security problems are taking new features, now they go far beyond preventing wars and armed conflict.

2. Literature Survey

Today, they have become their foundation, first source, main resource and primary weapon. A volume research on country’s information security policies and activity in the security aspect of the North Atlantic Alliance is presented in (Geers, 2011; Glyn, 2018; Kaija, Schilde 2014; Kempf, 2011; Shipan and Volden, 2008; Ključnikov, Mura, Sklenár, 2019).

Protecting their information interests, every state should take care of its information security. Also, it requires strengthening Ukrainian statehood. The balanced state information policy of Ukraine is formed as a part of its socio-economic policy, based on the priority of national interests and threats to the national security of the country. From a legal point of view, it is based on the foundation of constitutional state and is implemented
through the development and realizing national doctrines, strategies, concepts and programs (Drobyazko et.al. 2019a, 2019b).

Aim of the study: To identify the main characteristics, the nature and dynamic of international cooperation on information security and to spot the features of the major problems of international cooperation, subjects and prospects of partnership between the North Atlantic Alliance country’s.

3. Methods

Studying the issue of NATO’s information security policy in modern conditions, above all it is necessary to explore the essence of the information policy of this organization generally, and also the issues of ensuring information security and cybersecurity in the Alliance system.

Now the regulation of the information field in NATO countries is implemented in the following areas:

1) promotion of competition, the fight against monopolism and concentration of the media;
2) ensuring the right and technical capabilities for access to information and information resources of the whole population;
3) observation of freedom of speech;
4) protection of the interests of national minorities, national cultural legacy, language, opposition to the cultural expansion of other countries; youth protection in the information sphere;
5) protection of intellectual property, the fight against piracy;
6) resistance to cybercrime; introduction of electronic management;
7) legal regulation of the Internet;
8) ensuring information security, etc. (Background information on the Alliance, its policies, activities and structures).

4. Results

The NATO information policy system is derived from the implementation of the democratic concept of civilian control over the military-political area in conditions of public participation in the international military-political process. In relation to increase in public interest in the activities of the Alliance in the early 1990s, the main role in production of information activities is assigned to NATO’s own institutions. The main authority for the organization’s information policy is the Atlantic Council, which publishes its decisions and statements to the press and the general public. Besides the Atlantic Council, the NATO-member countries are also involved in public informing.

One of the leading roles in realization the Alliance’s information policy is played by the Information and Press Bureau. It is one of the structures of the Secretary General’s department (after the Prague Summit in 2002, it functions as the Department of Public Diplomacy, which provides information activities). Through the actualization of different programs and activities, the Information and Press Bureau helps partner nations and country-members to increase public awareness of the role and directions of NATO policies. The Bureau liaises with national information authorities and non-governmental organizations and arranges the events aimed at explaining public goals, missions and achievements of NATO (Background information on the Alliance, its policies, activities and structures).

NATO Information Security Issues

If we talk about ensuring the security of information, it should be noted that when NATO was created in 1949, the security systems of the member-countries differed considerably. The first NATO’s security system contained 8 levels of secrecy, was developed for documents in the form of “hard copies”, and also covered for creating two central security agencies and a certain number of subordinate structures in every country. In the
early 1990s, NATO began the political and military transformation of security structures, feeling not only positive (reducing exchange time, increasing carrier capacity, speed of search, classification, creating databases), but also negative (loss of confidentiality, integrity of information content or integrity systems, loss of access) consequences of informatization. The occurring of new threats in the information security sphere necessitated the modernization of attitude towards ensuring information security (Hughes, 2010).

The foundations of NATO’s security policy for so-called classified information are set out in CM (2002) 49 The Security in the Organization of the North Atlantic Treaty (Document CV (2002) 49: Security within the North Atlantic Treaty Organization (NATO). Classified information - a term used in the legislation of NATO member-countries regarding “sensitive” information, that is to say, information, which is sensitive to threats, that arise from unauthorized access to it, and therefore needs to be protected or at least limit access. NATO has 5 levels of information security with limited access: Cosmic TOP Secret (CTS), NATO Secret (NS), NATO Confidential (NC), NATO Restricted (NR), Unclassified but Sensitive (North Atlantic Treaty Organization. Defending against cyber attacks).

At the same time, no more than 3 classification levels for information with limited access are used in inner-state legislation, including information with a stamp, which accords with the RESTRICTED level and refers to official and utility secrets. Certain terminological and substantive differences in the definition and classification of information with limited access in the national legislation of NATO countries are compensated by the unification of strategy to such information in the basic areas of activity of member states: military, economic, law enforcement etc.

Document CM (2002) 49 sets the basic requirements for a system for ensuring physical, organizational, procedural and technical security, including information security. Following cooperation obligations, each NATO member country provides information with limited access, own assessment, and, depending on how other members fulfill their obligations, defines which information they need to make available to the Alliance. Consequently, any deviation of one or several Alliance’s members from the fulfillment their obligations may lead to a volume reduction and quality of information passed them.

The document declares 5 basic concepts of NATO security policy:

1) amplitude;
2) depth;
3) centralization;
4) access control;
5) personal control (North Atlantic Treaty Organization. Defending against cyber attacks).

The ground concept of information security in NATO system is that information must maintain its grade of protection continually the entire cycle of its circulation, starting from the source. Furthermore, control over the distribution and extension of information has to excide its leak.

Tasks, related to information security, are the responsibility of NATO Internal Security Committee (NSC). This Committee is the deliberative authority to the Council on issues related to NATO security.

Inside NATO, the national authorized body for information security execute the functions of guiding the creation of a governing body and regime departments, providing the security of NATO secret information in all institutions under its jurisdiction, both inside and outside of the country, ensuring the development of information protection plans in case of emergence to prevent loss of confidentiality of NATO information. Representatives of the national authority for information security take part in meetings of the NATO Security Committee, where security policies and instructions proceed. On the capacity of the authorized representative body functions affects the size and quantity of the country’s population, the geography of places where secret information is processed, and not least the distribution of powers between bodies in the sphere of national security. In some
NATO countries, the authorized body for information security is a part of the structure of the ministries of foreign affairs, defense and justice, in other countries it is headed by the Prime Minister or Minister of the Interior (NATO CCD CoE General Trends).

The country’s accession to the PfP (Partnership for Peace) program envisages for the ratification of the Security Agreement between NATO and the countries participating in the EAPC (Euro-Atlantic Partnership Council) and / or PfP. According to the statements of this Agreement, the parties agree to consult on political and security issues, to expand and intensify political and military cooperation in Europe, realizing that the potency of cooperation in these areas involves the exchange of participants with secret information or other information with limited access. The responsible authority for protecting the information exchanged between the parties in cooperation under the EAPC/PfP is NOS. Moreover, between NATO and the partner-country concludes an agreement about mutual ensuring the security information, exchanged between the parties, and assigns a liaison officer between NOS and the national information security authority. All data exchanged between the parties under the EAPC/PfP are limited information and intended only for government usage. Unlike the standards for the protection of information adopted by the NATO system, the minimum norm for the processing and protection of classified information exchanged by the parties under the EAPC/PfP programs do not have a level of “top secret”, because the amount of such information in the NATO system is utterly limited, and additional demands for ensuring the information security at this level of secrecy would unjustified tangle the mutual exchange procedure (NATO CCD CoE Mission and Vision).

This program uses the following information security support machinery:

- grants to establish and reinforce existing connection;
- creation of research centers;
- support for research projects.

The process of ensuring continuity of information security can be divided into six main phases (Fig. 1).

Analyzing Figure 1, we can see that all stages are interconnected within the government system ensuring the information security. The public policy of supporting the country’s information security defines the main directions of activity of authorities in this area. These directions are determined by the content of national interests, society and the individuals. In substance, that is true, as the task of information security measures is to minimize harm due to incompleteness, pastness or falsity of information or negative information impact due to the consequences of the functioning of information technologies, and also unauthorized extension of information. That is why information security assumes the presence of certain state institutions and the conditions of existence of its subjects, established by international and domestic legislation.

Review the basic building blocks (Figure 1)

Understanding the continual operation of information security system of the state. This phase is connected with the critical protection points (objects) identification. It is also about highlighting the main internal and external threats, that can become critical to the system.
Strategies for ensuring the continuity of the system. In this case, the task is focused on identifying and selecting alternative solutions on demand of the system in order to minimize threats.

The search for solutions balances between the cost of protection systems and their effectiveness.

Development and introduction. In this phase, efforts are focused on structuring and documenting the Government Continuity Program.

The development of the state’s information security culture provides for ensuring the process of development a state integrated information security system.

Execution, support and audit of the process of regulating the continuous functioning of the state’s information security system in divers crises and conflicts.

The management of the state’s information security program via the division of functions, provides for responsibility, insurance (guarantees) and management in the context of realization the general plan for the continual operation of the state’s information security system.

**Protection of the state information infrastructure**

If damage is caused as a result of imperfect information relations, the use of low-quality information, etc., then it demonstrates a decrease in information security (NATO Cyber defense). This allows us to think of unsolved problems of ensuring the information security of NATO countries:

– imperfection of the information policy and information security policy of the state;
– imperfection of the legal framework in the field of information relations and information security;
– deficiently development of the information infrastructure of the state;
– illegal activity of officials, various formations and groups in the field of information interests of citizens and the state;
– imperfection of the state system for ensuring information security;
– the possibility of unforeseen circumstances in systems and processes, based on the usage of information technology.

As a basic model of solving the information problem between two countries can be considered a pattern, which is based on the Richardson-Kasparov model (Madden, 2014). The pattern is based on the following conjectures:
– in the process of information attacks, each of the two countries tries to ensure the growth of the effectiveness of its information weapons proportionally to the level of the opponent;
– the economic potential of each country provides / limits the influence on the growth rate of the country’s information capacities;
– States trigger an increase of the level of information capacities, guided by their own intentions.

We inject the signs \( N_1(t), N_2(t) \) of the information power levels for each part of the conflict, where \( t \) - time. Then, the above conditions for the model operation can be formalized in the form of a system of two ordinary differential equations:

\[
\begin{align*}
\dot{N}_1 &= M_1(N_1 - N_1^*) x [1 - \exp (- p_1(k_1 N_2 - a_1 N_1 + g_1))] \\
\dot{N}_2 &= M_2(N_2 - N_2^*) x [1 - \exp (- p_2(k_2 N_1 - a_2 N_2 + g_2))],
\end{align*}
\]

where \( M_1, M_2, L_1, L_2, p_1, p_2, a_1, a_2, k_1, k_2 \) are positive coefficients, independent of time.

The parameters of model (1), by analogy with T. Saati, are defined as follows:
- \( k_1, k_2 \) - reaction indexes of information attacks;
- \( a_1, a_2 \) - costs indicators for the generation of information weapons;
- \( g_1, g_2 \) - pretence (aggressiveness) indexes if they are positive, or goodwill indexes if they are negative;
- \( M_1, M_2 \) - the cost of available information support;
- \( L_1, L_2 \) - limit values of information power levels;
- \( p_1, p_2 \) -indexes of importance of information costs.

Model (1) admits the existence of four special solutions, that determine the coordinates of the balanced positions:

1) \( N_1^p=N_1^*, N_2^p=N_2^* \), 2) \( N_1^p=N_1^*, N_2^p=L_2 \) 3) \( N_1^p=L_1^*, N_2^p=N_2^* \), 4) \( N_1^p=N_2^*, N_2^p=L_2 \) (2)

where \( N1^* \), \( N2^* \) is a solution to a system of linear algebraic equations.

The functions \( u_1 = r_1^0(x_1 - x_1^*) \) i \( u_2 = r_2^0(x_2 - x_2^*) \) characterize the policy of each country in the field of information opposition, where the variables \( x_1 = N_1 - N_1^* \); \( x_2 = N_2 - N_2^* \) have excursion from the equilibrium levels of information power. Here \( r_1^0, r_2^0 \) are stationary control parameters. Given the form of the function \( u_1, u_2 \) system (1) takes the form:

\[
\begin{align*}
\dot{x}_1 &= M_1 x (\delta_1 - x_1^*) x [1 - \exp (p_1(a_1 x_1 - k_1 x_2))] + r_1^0(x_1 - x_1^*) \\
\dot{x}_2 &= M_2 x (\delta_2 - x_2^*) x [1 - \exp (p_2(a_2 x_2 - k_2 x_1))] + r_2^0(x_2 - x_2^*)
\end{align*}
\]

The following conclusions can be made: each state, is a part of the global information space, must formulate a system of measures for its own steady information development in conditions of fierce competition, taking into account information security factors. To do this, you need to:

– understand the information attacks and how to oppose them.
– create the software to oppose the information attacks;
– analyse information threat indicators to improve decision-making mechanisms in public administration systems;
– assure the highest protection against exterior impacts;
– analyse and technical audit of all means of communication;
– consolidation of the activities of public authorities and Mass media in the field of political public awareness in order to neutralize the negative psychological effect in crises and conflicts (Kasapoglu, 2015).

One of the important task of NATO is to prevent acts of aggression in cyberspace, because cyber attacks become more frequent and more organized, and losing for government agencies, enterprises, objects of critical infrastructures, and also can reach a critical level that menaces to national and Euro-Atlantic prosperity, security and stability of the entire world community. Foreign military and intelligence services, organized criminal groups, terrorist and / or extremist groups can be the source of such attacks.

NATO Information Security Management

Despite the fact that NATO has been constantly protecting its information systems since its formation, at the Prague Summit in 2002, this issue was put into the political circle. Taking into account the technological progress achieved after the Prague Summit, the leaders of the Alliance countries at the Riga Summit in 2006 again assumed the need to ensure cyber security. At the same time, before the cyberattacks in Estonia in 2007, NATO’s activity in the cyber defense area focused mainly on protecting communications systems owned by the Alliance and were used by its members. The cyber attacks of 2007 forced NATO to think seriously about the problems of ensuring the cyberspace security, especially, to perceive the threats incoming from the Internet space as strategically important. NATO conducted a meticulous assessment of its approach to cyber defense and in October 2007 a report, based on that appraisal, was prepared to defense ministers of member-countries with recommendations on specific tasks of NATO, new sanctions to improve protection against cyber attacks. The official NATO Cyber Defense Policy was favoured by the defense ministers of the Member States and presented to the organization in April 2008 at the summit in Bucharest. The aim is “to provide opportunities to support allied countries, on demand, in resistance to cyber attack” (Nečas, Andrássy, 2018).

The number and complexity of cyber attacks increased quickly after the attacks on Estonia in 2007, and in the summer of 2008, the Russian war against Georgia had shown that cyber attacks became one of the main part of military operations using traditional weapons. Therefore, at the Lisbon Summit of NATO in 2010, was decided to develop a new organization’s policy of cyber defense, as well as a specific plan, which came into operation in June 2011. As part of their realizing, NATO uses defense planning processes to protect allies from cybercrime, and to optimize interaction, collaboration and information exchange. NATO works closely with the EU and the UN (Smaliukiene, 2018) on resistance to cyber threatens issues.

The future security of the NATO depends on the fast development and constant complication of cyberattacks, which The Strategic Concept and the Declaration of the Lisbon Summit have noted. The information attack is one of the most dangerous act of provocation and threat to the security and prosperity of the member states of the alliance. In the hierarchy of provocations, listed in this concept, dangers, that come from the information space, located immediately after the propagation of weapons of mass destruction and terrorism. Such attention, particularly, to the phenomenon of securitization due to which cybersecurity “has evolved from a technical discipline into a strategic concept”. Today, NATO is developing tools to prevent, detect, react and recover from attacks using the created Cyber Security Authority, the Common Center for Excellence in Cyber Threat Protection, and the Computer Emergency Response Force (National Cyber Security Strategy: Securing our Digital Future).

The Cyber Security Management Authority (OCHA) is responsible for agreement cyber protection activities inside of the organization. NATO CIDO is ran by the Cyber Defense Management Commission, which includes the leaders of NATO’s political, military, operational and technical authorities responsible for cyber defense issues.
It is the main consultative body of the North Atlantic Council on Cyber Defense and counsel some aspects of cyber defense to member countries. NATO CSTO is a part of the NATO Headquarters Security Challenge Office. The Center for Excellence in Cyber Defense (Tallinn), which received NATO accreditation in October 2008, is not given operational functions and acts as an instructional and training center where doctrinal and conceptual foundations of cybersecurity are elaborated. It is positioned as “the main source of expertise in the cyber defense field”, which “accumulates, creates and spreads knowledge on key cybersecurity issues within NATO, between the Alliance states and its partners” (Petrauskaitė, Rusko, 2018). The center carries out research and training on conducting information operations in the virtual space. With the support of the Civilian Communications Systems Planning Committee, the Center for Excellence in Combating Terrorism (Ankara), and the NATO “Science for Peace and Security” Program, the Center for Excellence in Cyber Defense conducts expert negotiations, seminars and exchanges of information with interested partners and international organizations (for example, with the EU and the OSCE). In 2015, the Center published a book on cyber war of Russia against Ukraine titled “Cyber War in Perspective: Russian Aggression against Ukraine”, which analyzes current acts in the field of information protection and the strategic and tactical aftermath of cyber war. On the pages of this issuance, experts, especially, note that the term “cyber attack” includes digital propaganda, DDoS campaigns, website defenses, leak of information due to attacks, and usage of malicious software for spying (Börzel and Risse, 2009). British experts reckon OCHA and the Tallinn Center as elements of a single organizational system, where the first is endowed with “wide facilities for real-time electronic monitoring” and functions at the operational-tactical level, while the Center, elaborating the long-term doctrine of NATO, constitutes an “intelligent platform” and is an element of a strategic level. Currently, the Center’s experts are finding the militarization of the Internet as one of the most dangerous trend in the global cyberspace (Glando, 2013).

As a result of the Warsaw Summit of Heads of State and Government participating in the meeting of the North Atlantic Council in July 2016, a released statement notes that cyber attacks are an obvious security challenge for the Alliance and can be not less destructive for modern societies than usual weapon attacks. Accordingly, cyber defense is one of NATO’s main mission - collective defense, and cyberspace is considered as a field of operations, where NATO defends itself as effectively as it does in the air, on land and at sea. This will increase NATO’s ability to defend and conduct operations in these areas, conserve freehand and decisions in different circumstances, and will promote NATO with provision of wide deterrence and defense capabilities.

NATO is cultivating cooperation with cyber defense in conformity with the Instructions on Cooperation with Cyber Defense with Partners and International Organizations 2008 and the Framework Document for Cooperation with Cyber Defense of NATO and Partner Countries in 2009, accepting the need to define united approaches for using modern information protection systems, in view of information security requirements. Information security in the case of creation common information and telecommunication systems, where information with limited access circulates, is achieved through the development of offers of the protection of confidential communications using NATO equipment, that is necessary to create information and communication systems in government, along with upgrading their specialists regarding the Information Security within PfP (Cornish, 2014).

The terminological base, used at the EU level is reflected in the EU Council Directive “about European Critical Infrastructures and Measures for Their Protection”. The critical infrastructure in this document is presented as “tools, systems or a part of them, located in the EU countries, having importance for maintaining vital public functions, health, safety, defense, economic and social welfare of the people and the failure of which or even destruction will cause serious consequences for EU member states due to the above functions fail”. In the information sphere, civilian and military objects are bound up (Reynolds, 2007). Table 1 compares the Russian and American sight of critical state infrastructures.
Table 1. Critical Information Infrastructures of EU and US Countries

<table>
<thead>
<tr>
<th>EU countries</th>
<th>USA</th>
<th>Military / Civilian sphere of application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthcare</td>
<td>Public health</td>
<td>Civilian objects</td>
</tr>
<tr>
<td>-</td>
<td>First Responder Services</td>
<td>Civilian objects</td>
</tr>
<tr>
<td>-</td>
<td>National monument</td>
<td>Civilian objects</td>
</tr>
<tr>
<td>Agriculture</td>
<td>Feeding and Agriculture</td>
<td>Dual-use facilities</td>
</tr>
<tr>
<td>Water supply</td>
<td></td>
<td>Dual-use facilities</td>
</tr>
<tr>
<td>Public administration</td>
<td>Public administration</td>
<td>Dual-use facilities</td>
</tr>
<tr>
<td>Large scale Information systems</td>
<td>Information and telecommunication systems</td>
<td>Dual-use facilities</td>
</tr>
<tr>
<td>Energy industry</td>
<td>Energy industry</td>
<td>Dual-use facilities</td>
</tr>
<tr>
<td>District heating</td>
<td>-</td>
<td>Dual-use facilities</td>
</tr>
<tr>
<td>banking and financial systems</td>
<td>banking and financial systems</td>
<td>Dual-use facilities</td>
</tr>
<tr>
<td>Transport system</td>
<td>Land and maritime transport</td>
<td>Dual-use facilities</td>
</tr>
<tr>
<td>Industry</td>
<td>Critical production</td>
<td>Dual-use facilities</td>
</tr>
<tr>
<td>-</td>
<td>Post Service</td>
<td>Dual-use facilities</td>
</tr>
<tr>
<td>Municipal management</td>
<td>-</td>
<td>Dual-use facilities</td>
</tr>
<tr>
<td>Civil defense</td>
<td>-</td>
<td>Dual-use facilities</td>
</tr>
<tr>
<td>Defense</td>
<td>Military-industrial complex</td>
<td>Military aim</td>
</tr>
<tr>
<td></td>
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<td>Military aim</td>
</tr>
</tbody>
</table>

Source: Developed by the authors according to the source The World Factbook: Central Intelligence Agency

Currently, critical information and traditional infrastructures exist. However, subject to the formation of the “digital economics” there is observed a wide spread of information infrastructures, because they are more economical, efficient and ergonomic.

NATO also comprehends the need to strengthen monitoring of critical networks within the Alliance and preclude identified drawbacks. For that purpose, the Tallinn Center organizes tuition and assists member countries in improving cyber defense programs, and the allies expand their early prevention resources in the form of a common network of monitoring nodes and sensors. NATO uses the defense planning process to promote the development of cyber defense capabilities of allies, helping individual member countries and optimizing information exchange, cooperation and compatibility (Quackenbush, 2015).

5. Discussion

In relation to increased danger of cyber attacks, NATO sets the requirements for all countries, interested in maintaining the integrity, inviolability and confidentiality of their information space. Especially, the information structure of the Alliance member countries should be constantly improved, development rate of the recent information technologies and their extension should accelerate. The development of electronic certification systems, cryptography, proper training of personnel are also needed. The formation and implementation of a unique state policy in the context of ensuring the security of national interests from threats in the information field should be one of the priority areas for the development of every state. The industry development of information and telecommunication facilities, their distribution in the domestic media market, the modernization of telecasting and broadcasting systems, the updating of the technical base to ensure the protection of information are also important steps to assure information security.

As a result of attacks, directed against government and implemented through the Internet, NATO’s attention has pointed towards the issue of cyber defense of individual member countries. The Alliance does not exclude the need to respond quickly to cyber attacks by sending a team of experts to any member country that suffers
from cyber attacks, or to a country that feels the measure of invasion of its information space. Nevertheless, one of the main role in protection and security of their own communication systems signify the allies themselves. NATO requires a reliable and secure auxiliary infrastructure, therefore continue to work with the national authorities to develop concepts and criteria for ensuring a minimum level of cyber defense where national networks and NATO networks are interconnected (Linke & Zerfass, 2011).

In course of time, NATO plans to completely provide itself with an appropriate set of cyber defense tools, including passive and active elements. NATO also works closely with other organizations to overcome the security risks in cyberspace.

The issue of ensuring information security of NATO, besides the technical support and strategic planning issues, also has a political measuring. First of all, it involves the possibility of applying the Article 5 of the Washington Treaty in information attacks. The main protagonists of expanding the concept of collective liability in the field of ensuring information security in the NATO system are Estonia and the United States. Particularly, Professor J. Goldgeyer notes that, cyberattacks are not an “armed attack”, so, they are not refer to Art. 5, anyway, we can draw a conclusion that the Alliance “must unify to resist attacks, which menace the security of any member of NATO”.

Notably, the issues of countering threats to information security, including cybersecurity, belong to “soft security” field, while NATO’s main task is resistance to convention security challenges - provision “hard security”. Therefore, another topical factor that displays itself at the transatlantic level is the “division of labour” between NATO members hence some countries specialize in “soft security”, while others carry “solid” military missions. The consequence of this is a difference in resistance approaches: the USA, France, Great Britain and Germany compare the information security with military strategy, but Estonia, which does not have a powerful military potential, emphasizes the key role of civil society and the private sector.

Conclusions

Based on the analysis of the current legislation and practice of European countries, it is proposed to refuse the legislative fixing list of information security threats. Agreeably, it was offered to provide at the same time, firstly, information security from demolition, distortion, blocking, unauthorized leakage or infraction of the set routing procedure, and secondly, information security of the citizen and society. This requirement is dictated by the value of the information picture of the world, which is formed by the individual and social levels. A common tool of threats is the spread of the so-called N. Pathogenic texts aimed at deconstructing ideological, value, moral and ethical and other mental systems.

It is proved, that opposition information threats mechanisms from external sources should include:

a) the ensuring security purpose, concludes in maintain the integrity and security of the information sphere in the process of its functioning;

b) the level of security, that identifies the elements of the system that may face potential and real hazards;

c) security sector, that defines the functioning and development of the information sphere;

d) security parameters, that set the allowable limits of deviations in the information security system potential, the quantity of its elements, their quality, connection;

e) a list of threats, the consequences of their realization and prevention mechanisms.

The methods of resistance to information threats from external sources are provisionally divided into 2 groups:

1) preventive - are used to avoid the deployment of threats or to prevent the appearance of new risks on the entry-level of forthcoming such threats;

2) operational - are used directly in reply to the aggressive steps of external sources of information threats and related to their launching and realization.

The necessity of developing the functional duties of the subjects of ensuring information security of NATO countries in relation to the implementation of coordination and interaction is proved.
References

Background information on the Alliance, its policies, activities and structures. Available on the Internet: http://www.nato.int/cps/en/natohq/topics.htm


Short biographical note about the contributors at the end of the article:

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Towards Environmental Sustainability: A Case Study of Green Supply Chain Management Practice

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Abstract. The main objective of the study is to investigate the moderating effect of green Supply Chain Management Practices (GSCMP), Internal Environment Management (IEM), Internal Supply Chain Process (ISCP), Quality Information System (QIS), Green Knowledge Management Capability (GKMC), and Environment Performance (EP) of pharmaceutical industry of Thailand. For this purpose, data has been collected from the 500-supply chain and procurement managers which yield a 68% response rate. The SEM analysis has shown that ISCM has a positive and significant association with the EP, GKMC also has positive and significant association with the EP. In the same vein, it is also found that IEM and QIS have a positive and significant association with the EM of pharmaceutical industry of Thailand. On the other hand, indirect moderating also shows GSCMP has a significant moderation on the relation of ISCP, IEM, QIS and EP of pharmaceutical industry of Thailand. Whereas, GSCM did not significantly moderates on the relationship of GKMC and EP. These findings show that GSCMP is considered to be a significant moderator because it has moderating effect in most of exogenous and endogenous variable. Thus, based on this study contributed a body of knowledge in the form of empirical findings which could become a new area of research in future. The current study could provide some guidelines to supply chain and procurement department to know about the importance GSCMP to increase the EM. The research limitations and future directions are also discussed at the end of the study.

Keywords: green supply chain management practices; internal environment management; internal supply chain process; green knowledge management capability; environment performance, pharmaceutical, Thailand


JEL Classification: O53

1. Introduction

Wide arrow of environmental sustainability facets is in focus both of society and researchers in recent years (e.g. Sarma, Karnitis, Zuters, & Karnitis, 2019; Moumen, El Idrissi, Tvaronavičienė, & Lahrach, 2019. Fatoki, 2019; Lavrinenko, Ignatjeva, Ohotina, Rybalkin, & Lazdans, 2019).

Integration of sustainability concerns in the supply chain management practices has appeared to be a topic of interest among researchers (Chetathamrongchai & Jermsittiparsert, 2019; Jermsittiparsert, Namdej, & Sriyakul, 2019; Somjai & Jermsittiparsert, 2019). Public awareness is increasing and in presence of strict regulations regarding the environment and sustainability, green supply chain management practices have appeared to be a vital factor in the Thai organizations (Jermsittiparsert, Siriattakul, & Sangperm, 2019). The concern for the environment in the developed countries it is obvious from the strict regulations such as “WEEE and ROHS directives”. Thus, it made it impossible for the businesses to ignore their supply chain impact on the environ-
ment (Jermsittiparsert et al., 2019). Pharmaceutical manufacturers’ supply chain is directly influenced by the environmental guidelines especially in emerging countries. Firms have employed certain green practices in their supply chains, and they are striving hard for its improvement.

Therefore, it makes it important to study how the firms’ knowledge and environmental capabilities contributes in the sustainable supply chains and finally its influence on the environment. Employees employed across pharmaceutical industry is subsectors in Thailand (Kritchanchai, 2012). Organizations are working on environmental concerns due to their processes and in this regard, they have addressed the certain issues and adopting the environment friendly supply chain philosophy. Whereas at the other end, organizations are also striving hard to get their supply chain integration into business process which results in minimum cost and provide the customers with optimal services while also dealing with pressure to survive in competitive pressure (Ali & Haseeb, 2019). Competing in competitive environment and taking care of the environment calls for the attention towards the strategies which can make the supply chain strategies better and contribute towards the better environmental performance. Organizations compete on their resources and knowledge is one of the core resources organizations do have (Muhammad, Qazi Muhammad Adnan, & Aviral Kumar, 2013). It is regarded as the strategic resource which helps an organization to survive, being stable, grow and improve. Azapagic (2015) also further suggested that it is serves the basis to boost the performance of an organization. Further, it can also make sure the smooth sharing of information and support among employees which further translates into efficiency and creativity. Knowledge management helps an organization to develop approaches which do assist the acquisition of right knowledge at right time. Chan, He, Chan, and Wang (2012) further recommended that it is one of the main facets of an organization and also knowledge management is regarded as an important capabilities of firms which could make to an organization successful because these are regarded as asset which assists the integration between all supply chain partners. Moreover, Attia (2016) made an argument that scarce studies are available on the association between knowledge management and supply chain practices. Empirical evidence is present, which states that the green practices in supply chains assist an organization to outperform in fiscal and environmental performance. In this regard, Dubey, Gunasekaran, and Ali (2015) suggested that it is much needed to pinpoint the drivers require to employee the green supply chain management practices. Further it was also argued that even though these practices have gained much attention in recent two decades, still there is need to study the construct to get more insights in future studies (Kritchanchai, Somboonwiwat, & Chanpuypetch, 2015; Nakornsri & Lee, 2008). In addition, previous studies also have a main focus on the developed economies, whereas, there is a little attention on the developing economies especially on the pharmaceutical industry of Thailand. As, this industry in Thailand has a big contribution in the social and economic development, therefore, the industry could not be ignored.

As, customer awareness regarding the environment has increase as compared to previous decade, firms’ practices embed its image in mind of customers. So, to manage the sustained competent Thai Pharmaceutical industry it has become essential to create a good image of organizations. The main objective of the study is to investigate the moderating effect of green Supply chain management practices (GSCMP), Internal Environment Management (IEM) internal supply chain process (ISCP), quality information system (QIS), green knowledge management capability (GKMC), and environment performance (EP) of pharmaceutical industry of Thailand. Later sections of the study mention literature review, methods, results and potential areas for future studies.

2. Literature Review

Generally speaking, how do the firm’s actions impact the environment can be regarded as the environmental performance (EP) of that firm. The environmental performance can be positive or negative based on its impact on environment. Therefore, Rotova (2018) suggested that the EP denotes to the impact of activities of an organization on the environment. In order to get the better EP, it is necessary for an organization to point out the sources for the environmental problems such as logistics, procurement and production etc. From supply chain management practices (SCMP) perspective (Darroch, 2005; Nonaka & Takeuchi, 1995; Sohal, Ragsdell, Hislop, & Brown, 2018) explained that EP measures the organizations’ ability to lessen the emission of CO2,
SO2, NOx and other dangerous gases which results due to overall activities in a supply chain of an organization. It can be stated as a relationship between the firm and the environment which contains the outcomes of usage of resources, impact of organizational activities, goods and services on environment and meeting the legal requirements. According to Green, Inman, Sower, and Zelbst (2019) during the production process businesses often use bundle of resources which are already limited. Thus, they result in environmental problems by releasing the waste into water, air and cause the pollution. Green et al. (2019) further explored that actually EP assesses the capability of an organization to lessen the waste, pollution, prevention of hazardous chemicals and reduce its impact on the environment. Similarly, it was argued that the rising environmental concerns have made it necessary for the organizations to reconsider their impact on environment and address the concerns regarding the environmental performance (Yildiz Çankaya & Sezen, 2019).

**Green supply chain management practices**

The rising environmental issues such as global warming, resource depletion, change in biodiversity has put the sustainability at danger. Individuals from diverse areas such as professionals, scientists, academicians and scholars are working to recommend the possible ways to keep the environmental sustainability (Wilairatana, Ngamjarussrivichai, Takuma, & Konosu, 2018). In this regard it is explained that the unexpected and reckless industrial actions carry a possible danger to the sustainability. Which has resulted in an attempt to develop sustainable practices in every industry. It can be termed as “Green practices”. The word green implies that performing the actions by considering their impact on environment and ecology (Wilairatana et al., 2018). Therefore, the environmental concerns have triggered the move to redesign the supply chain to be sustainable (Jermsittiparsert et al., 2019). Being a significant component of operations management, supply chain has viable impact on the environment in form of emissions, pollutions etc. Jermsittiparsert et al. (2019) also explained that environment related concerns have become part of the organizations as an effort to lessen their environmental impression. Furthermore, Jermsittiparsert et al. (2019) suggested that the application of green concept (environment related concerns) in SCMP is termed as green supply chain management practices (GSCMP).

In addition, Attia and Salama (2018) also defined the GSCMPs as “integrating environmental thinking into supply-chain management, including product design, material sourcing and selection, manufacturing process, delivery of end-of-life management of the product after its useful life”.

Further, Fernando, Walters, Ismail, Seo, and Kaimasu (2018) also proposed GSCMP as “an integration of concerns regarding the environment into the internal practices of an organization which are linked with the sustainable supply chain”. GSCMP have been defined by different researchers differently. For instance, Wilairatana et al. (2018) also recommended that “it is the broad concept and there is no single clear definition to define it”. Regardless of definitions and different conceptualizations GSCMP are focused on the following aspects: environmental issues should be kept in mind while designing a product, what is the impact of organization on the environment, green procurement, production, distribution and also the green reverse logistics. It also focuses on the five practices such as reduction of waste, remanufacturing, recycling, and alternatives disposal which is primarily focused to reduce the waste generation inside the supply chain (Hou, Hsieh, & Lin, 2019; Yang & Yang, 2019). It also improves the operational performance of business and environmental performance of an organization (Yang & Yang, 2019).

**Internal supply chain process and Environment performance**

Internal supply chain process (ISCP) also recognized as rearrangement is referred to the application of go forward along with one and more than functions like production, sourcing, and convey to a considerable subsequently point in SCM (Ahmad, Bin Mohammad, & Nordin, 2019; Johnson & Davis, 1998; Van Hoek, Vos, & Commandeur, 1999). An author revealed that there is a necessary to develop rearrangement strategy like examining how more steps a company wants to delay and which step they will be postpone (Varsei & Polyakovskiy, 2017; Verma, 2014). Benefit of postponement for firm is that firm have extra time for making changes in needs of customers and moderation of the demand function (Waller et al., 2000). ISCP have being a positive impact on EP (Wijetunge, 2017). Based on the previous discussion, the following hypotheses is proposed for the current study:
H1: There is a significant association between the Internal supply chain process and Environment performance of Pharmaceutical industry of Thailand.

Green knowledge management capability and environment Performance

Recent, decade has seen an increasing research trend on how the knowledge management contributes towards the supply chain management (SCM). Considerable research has concluded that the knowledge management results in improved SCM (Yang & Yang, 2019). Further Green et al. (2019) also discussed that the knowledge management capability of the organizations helps them to improve their performance. Organizations through their knowledge management capabilities can exploit the new knowledge, gain the new knowledge which will contribute towards the competitiveness of organization. It is the organizational capability which addresses the firm’s ability to gain, create, and transfer, integration, sharing and application of resources regarding the knowledge and activities across the functional boundaries to produce new knowledge. Further the implementation of knowledge management in organizations provide them with the ability to cope with the ever-rising competition in the corporate world. Some researchers have regarded the knowledge management capability as set of knowledge process and include some aspects such as knowledge attainment, distribution and employment (Layachi, 2019; Myambo & Munyanyi, 2017), documenting, acquiring (Arfi, Hikkerova, & Sahut, 2018; Hassan & Al-Hakim, 2011) and documenting the knowledge, transfer and protect it. Based on the above conceptualizations and different perceptions of the researchers it is argued that “the green knowledge management capability denotes the firm’s ability to gain, create, and transfer, integration, sharing and application of resources regarding the knowledge and activities across the functional boundaries to produce new knowledge related to go green concept” (Albort-Morant, Leal-Rodriguez, & De Marchi, 2018; Arfi et al., 2018). Which is ultimately aimed for the betterment of the organizations’ performance in an environment.

Al-Ghwayeen and Abdallah (2018) further conducted a study by collection of responses from the companies they reported that KMC of an organization significantly impact the supply chain management practices. Previously it is argued that when knowledge is shared, integrated and applied between the supply chain members it leads towards the significant benefits for an organization which include the cost and cycle time reduction, improved quality and good customer services (Petljak, Zulauf, Štulec, Seuring, & Wagner, 2018). Therefore, the knowledge management between the supply chain members led towards the productive processes involved in supply chain (Jermsittiparsert et al., 2019). It ultimately increases the chances to survive in competitive environment. Similarly, conducted a study by Papa, Dezi, Gregori, Mueller, and Miglietta (2018) which conclude that supply chain knowledge management capabilities are dynamic capabilities which lead towards the productive decision making. Which ultimately improves the supply chain performance. There is insufficient empirical evidence available regarding the link between knowledge management capabilities and supply chain management practices (Gilal, Zhang, Gilal, & Gilal, 2018). Based on the previously mentioned literature review it is hypothesized that:

H2: There is significant relationship between the Green knowledge management capability and environment of pharmaceutical industry of Thailand.

Internal environment management and Environment performance

According to Feng et al. (2018) and Darnall, Jolley, and Handfield (2008) explained that internal environmental management refers to the firms’ policies to safeguard the environment and targets to ensure the environment safety. All the policies and targets are made by organizations. Internal environment management practices make sure the support from all managerial managers regarding the practices related to environment management. It also makes sure the cooperation between the different departments regarding the environmental improvements and building a system (Malimi, 2017).
number><dates><year>2017</year></dates><urls></urls></record></Cite></EndNote>. All the practices mentioned earlier falls under broad domain of internal environment management. Similar term such as green internal management has also been used to conceptualize this construct which denotes the practices of an organization which are employed with the primary aim to lessen the impact of an organization on the environment. These practices include the policies, internal awareness and regulatory compliance of an organization with the environment (Soner, Gul, & Yildirim, 2016).

GSCMP ask for greater coordination such as for developing a new product aligned with green concept requires collaboration with customers for the integration of their demands while product is in design process. Internal extensive environmental management ask for great deal of coordination. This can be attributed to the internal environment management (Foerstl, Azadegan, Leppelt, & Hartmann, 2015; Schmidt, Foerstl, & Schaltenbrand, 2017). TQM and JIT are the factors of internal environment. In this regard, Dubey et al. (2015) concluded that JIT and TQM both are significantly related with the GSCMP and both of them advances the green practices of an organization. Based on the literature it is hypothesized that:

**H3:** There is significant association between the Internal environment management and environment of the pharmaceutical industry of Thailand.

**Quality of information sharing and environment performance**

Quality of information sharing (QIS) contain timeliness, accuracy, credibility, adequacy, as final credibility of the information communicated (Moberg et al., 2002; Monczka et al., 1998). Furthermore, information sharing is historical, and significant of its effect on supply chain management (SCM) with that what, when, and with all information shared (Holmberg, 2000; Khalil, Khalil, & Khan, 2019). Consequently, business need to interpret their significant information as firm asset and confirm that information should be communicated with the minimum delay and distortion (Li et al., 2006). Empirically, a positive effect of the QIS on FP has been found in the study of (Li et al., 2006). For the current studies there are following hypotheses are proposed:

**H4:** There is significant association between the quality of information sharing and environment of the pharmaceutical industry of Thailand.

**GSCMP as a moderator among the exogenous and endogenous variable**

An organization’s performance in environment can be significantly improved by green supply chain management practices as it is focused to eradicate all kinds of environmental wastes. These practices also do decrease the ecological impact as these are focused for better environmental performance by decreasing the emissions and release of solid wastes in water (Dubey et al., 2015). Similarly, other study by Rotova (2018) conducted a study and collected data from the companies dealing in chemicals, automotive and electronics companies (Ali & Haseeb, 2019). The results reported a significant and positive connection between internal environment management and GSCMP. Regarding the green practices, it is argued that these lead towards the improved environmental performance by decreasing the wastes resulted due to the businesses. Conclusively the environment is positively influence by green supply chain practices. So, it is hypothesized that:

Previously various studies have reported a significant and positive link between the knowledge management capability and GSCMP (Dalpati, Rangnekar, & Birasnav, 2010; Desouza, Chattaraj, & Kraft, 2003; Green Jr, Zelbst, Meacham, & Bhadauria, 2012; Loke, Downe, Sambasivan, & Khalid, 2012). Which asserts that when the organization is successfully acquiring, sharing and implementing the knowledge related to green practices throughout the supply chain then it leads towards the green supply chain management practices. Similarly, when firms also do maintain their internal environmental it will also lead towards the green supply chain management performance. Which finally will improve the environmental performance of a firm. It has been supported by previous study which argued that manufacturing firms which do follow the JIT and TQM improves their green supply chain performance as JIT are focused to reduce the waste and TQM are focused at to provide
with optimal quality products and services. Thus, it ends up in improved environmental performance (Dubey et al., 2015). Green supply chain management practices are broad in context and are inclusive of every effort which is aimed to reduce the organizational adverse effect on the environment (Rotova, 2018). Based on the previously available empirical evidence it is hypothesized that:

**H5:** Green supply chain practices are significantly moderating between Internal supply chain process and environment performance of pharmaceutical industry of Thailand.

**H6:** Green supply chain practices are significantly moderating between green knowledge management capability and environment performance of pharmaceutical industry of Thailand.

**H7:** Green supply chain management practices are significantly moderating between internal environmental management and environment performance of pharmaceutical industry of Thailand.

**H8:** Green supply chain management practices are significantly moderating between quality of information system and environment performance of pharmaceutical industry of Thailand.

**Research Conceptual Framework** (see figure 1)

![Research Framework of the study](image)

**Figure 1.** Research Framework of the study

### 3. Research Methodology

The current study used cross sectional research design and quantitative research approach. In the current study, the model and hypothesis were tested in manufacturing industry of Thailand. The manufacturing sector of Thailand has been recognized as 2nd largest producer, which makes it an important sector to study. For the data collection, the 500 questionnaires were distributed among the supply chain and procurement mangers of the pharmaceutical industry of Thailand by using the purposive sampling technique. Among of the 500 questionnaires 340 questions were returned back which yield a 68% response rate. As, questionnaire was used for data collect and it was consisted of two sections which are as follows: First section consisted upon the demographic
information of the respondents. The second section consisted upon the questions regarding the variables under study. Following are the details of the measures adapted for the present study. To measure the green knowledge management capability of the organization 15 items scale was adapted (Dalpati et al., 2010; Ibrahim, Mukhtar, & Gani, 2017; Jermsittiparsert et al., 2019). Internal environmental management was measured by using 7 items scale, green supply chain management practices were measured by using 16 items scale and 6 items scale was used to measure the Environmental performance (Jermsittiparsert et al., 2019; Suy, Chhay, & Choun, 2018). In addition, for the quality of information system 4 items were adopted from the study of (Li, Ragu-Nathan, Ragu-Nathan, & Rao, 2006). Lastly, for the internal supply chain process three items was adopted from the study of Li et al. (2006).

Analysis and Discussions

The SEM-PLS, which in modern times is one of the robust techniques to analyses the data on social issues is used as the statistical tool in currents study. Recently many researchers such as Patidar and Din (2018) and Ahmed, Zin, and Majid (2016) has employed and argued that whenever we are dealing with some novelty in conceptual models or need an advance assessment of any existing phenomena, we prefer SEM-PLS over other technique such as multiple regression analysis. Patidar and Din (2018) and Ahmad et al. (2019) and Henseler, Ringle, and Sinkovics (2009) further argued that the PLS-SEM is a two-step equation, which is an advance form of multiple regression and accounts for two assessments namely the inner model assessment and the outer model assessment. The first step is estimation of the reliability and validity of the model. In Smart-PLS, after obtaining the results of reliability and validity for each construct, examining the structural model results is necessary in order to test the hypothesis. There are five steps of procedures in examining the structural model results; (1) examine the structural model for collinearity issues; (2) the significance of path coefficients; (3) followed by examining the level of $R^2$ values; (4) assessment of $f^2$ effect size; and last but not least, (5) examining the predictive relevance (Q$^2$) (Hair, Hollingsworth, Randolph, & Chong, 2017). The reason why the SEM-PLS is preferred the multiple regression is that the earlier handles the multiple equations simultaneously and can produces results with a simultaneous operation by producing a relationship with all direct and intervening phenomena. Reliability analysis is performed in order to find internal consistency of the items. Cronbach’s alpha is the most widely used in order to test the reliability level. Although there are many findings that founds that the value of composite reliability is always higher than Cronbach’s alpha.

An indicator declared as valid and significant if it has a loading factor over than 0.5 on the targeted construct (Hair et al., 2017a). Thus, this study analyzed the output of the loading factors which gained thru Smart-PLS. Before testing the hypothesis, data reliability and validity was scrutinized. These steps were taken through PLS 3. The factor loading of all the items in the current study are greater than 0.5 and Cronbach’s alpha value is greater than 0.70. Moreover, for the convergent validity average variance extracted (AVE) should be greater than 0.5 (Hair, Hollingsworth, Randolph, & Chong, 2017). All of the values are greater than 0.5. In additon, to measure the distriminant validity, cross loading, Fornell Lacker and HTMT are the three crieteria. In the discrimiant validitiy, the value of Fornel Lacker diagnoal values should be greater than from other values. In additon, the minmum values for the HTMT should be less than 0.90 (Henseler, Ringle, & Sarstedt, 2015). All of the values for the convergent and discriminant values are depicted in the Table 1, 2 and 3.

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**Green Supply Chain Management Practices**

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**Internal Environment Management**

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**Internal Supply Chain process**

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<tbody>
<tr>
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<td>0.76</td>
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<td>ISCP2</td>
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<tr>
<td>ISCP3</td>
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</table>

**Quality of information sharing**

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<td>0.77</td>
<td>0.833</td>
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<td>QIS2</td>
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<tr>
<td>QIS4</td>
<td></td>
<td>0.748</td>
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</table>

**Note:** is presenting the values for ‘factor loadings’, ‘composite reliability (CR)’ and ‘average variance extract (AVE)’. If factors loadings are greater than 0.50 it adds to the convergent validity of measurement. Table 1 and figure 2 is showing that all the factor loadings are in acceptable range. For convergent validity the values for CR and AVE should be greater than 0.8 and 0.5 respectively and all the values for CR and AVE are within acceptable range which established the convergent validity.
Table 2. Forner Lacker Discriminant Validity

<table>
<thead>
<tr>
<th></th>
<th>EP</th>
<th>GKMC</th>
<th>GSCMP</th>
<th>IEM</th>
<th>ISCP</th>
<th>QIS</th>
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<tbody>
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<td>EP</td>
<td>0.870</td>
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<tr>
<td>GKMC</td>
<td>0.334</td>
<td>0.750</td>
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<tr>
<td>GSCMP</td>
<td>0.168</td>
<td>0.500</td>
<td>0.879</td>
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<tr>
<td>IEM</td>
<td>0.449</td>
<td>0.340</td>
<td>0.600</td>
<td>0.780</td>
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<tr>
<td>ISCP</td>
<td>0.719</td>
<td>0.607</td>
<td>0.724</td>
<td>0.611</td>
<td>0.860</td>
<td></td>
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<tr>
<td>QIS</td>
<td>0.230</td>
<td>0.260</td>
<td>0.490</td>
<td>0.230</td>
<td>0.340</td>
<td>0.789</td>
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</tbody>
</table>


Table 3. HTMT Discriminant

<table>
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<th></th>
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<th></th>
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<th></th>
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<tbody>
<tr>
<td>EP</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>GKMC</td>
<td>0.334</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>GSCMP</td>
<td>0.168</td>
<td>0.724</td>
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</tr>
<tr>
<td>IEM</td>
<td>0.449</td>
<td>0.823</td>
<td>0.560</td>
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<tr>
<td>ISCP</td>
<td>0.719</td>
<td>0.607</td>
<td>0.600</td>
<td>0.611</td>
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<td></td>
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<tr>
<td>QIS</td>
<td>0.230</td>
<td>0.260</td>
<td>0.490</td>
<td>0.230</td>
<td>0.340</td>
<td></td>
</tr>
</tbody>
</table>


4. Structural Model

Direct Effect

The next steps in assessing the structural model are to examine the hypothesized relationships among constructs in the measurement model. The model explanatory power was resolute through inspecting how well the observed data fit the hypothesized relationship among the constructs. Following, Chin (1998), bootstrap the resampling approach has been hired to test all the significant of all each coefficient. As recommended by Hair et al. (2014), five thousand duplications through using the randomly selected subsamples which were performed to test all the hypothesized relationships. Table 4 depicts the beta coefficients and t-values for the first 4 direct hypotheses.

The SEM analysis has shown that internal supply chain management (ISCM) has a positive and significant association with the environment performance (EP). Similarly, green knowledge management capability (GKMC) also shown the positive and significant association with the EP. In the same vein, internal environmental management (IEM) also shown the positive and significant association with the EP. Likewise, quality of information sharing (QIS) also shown the positive and significant association with the EP. All of the four direct hypotheses of the study are supported. These findings indicate that pharmaceutical companies of Thailand have a greater emphasis on supply chain activities to enhance their environmental performance. All of the results are depicted in the following Table 4.
Table 4. Direct Effect of the Model

<table>
<thead>
<tr>
<th></th>
<th>Beta</th>
<th>SD</th>
<th>T Statistics</th>
<th>P Values</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISCP -&gt; EM</td>
<td>0.104</td>
<td>0.052</td>
<td>2.002</td>
<td>0.046</td>
<td>Supported</td>
</tr>
<tr>
<td>GKMC EM</td>
<td>0.548</td>
<td>0.057</td>
<td>9.626</td>
<td>0.000</td>
<td>Supported</td>
</tr>
<tr>
<td>IEM -&gt; EM</td>
<td>0.355</td>
<td>0.1</td>
<td>3.554</td>
<td>0.000</td>
<td>Supported</td>
</tr>
<tr>
<td>QIS -&gt; EM</td>
<td>0.693</td>
<td>0.044</td>
<td>15.736</td>
<td>0.000</td>
<td>Supported</td>
</tr>
</tbody>
</table>

Note: EP-Environmental Performance, GKMC- Green Knowledge Management Capability, GSCM- Green Supply Chain Management Practices, IEM- Internal Environment Management, ISCP- Internal Supply Chain process, QIS-quality information system, p<0.05

Indirect Effect

The research model hypothesized that green supply chain management practices (GSCMP) moderate in the relationship of three antecedents of exogenous and endogenous variable. The moderation test in the current study was to be employed through using the two-stage calculation approach. This approach was employed as per the suggestion of the Hair, Hult, Ringle, and Sarstedt (2017b), who suggested that when the study objective is whether is that moderating variable significantly moderates in the relationship of exogenous and endogenous variable. For this purpose, to test the moderation hypotheses, this study has used (Baron & Kenny, 1986) criteria to determine whether the moderation condition is exist.

The indirect effect of SEM analysis has shown that GSCMP is significantly moderates in the relationship of ISCP and EM and hypothesis (5) is supported, whereas, GSCMP has insignificant moderating effect in the relationship of GKMC and EM and hypothesis (6) is not supported. On the other hand, it found that GSCMP is sig-
nificantly and positively moderates in the relationship of IEM and EM and hence, hypothesis (7) is supported. In addition, GSCM also significantly moderates in the relationship of QIS and EM, therefore hypothesis (8) is supported. These findings show pharmaceutical companies of Thailand has greater emphasis on the GSCMP to enhance the SCM practices for the improvement of EP. The GSCMP is not significantly moderates on the relationship of GSCMP and EP. One of the possible reasons for this relationship is due to overlapping of other variables. All of the results are depicted in the following Table 5.

Table 5. Indirect effect of the structural model

<table>
<thead>
<tr>
<th></th>
<th>Beta</th>
<th>SD</th>
<th>T Statistics</th>
<th>P Values</th>
<th>Beta</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISCP* GSCMP -&gt; EM</td>
<td>0.196</td>
<td>0.207</td>
<td>0.067</td>
<td>2.906</td>
<td>0.004</td>
<td>supported</td>
</tr>
<tr>
<td>GKMC* GSCMP-&gt;EM</td>
<td>-0.059</td>
<td>-0.064</td>
<td>0.05</td>
<td>1.17</td>
<td>0.242</td>
<td>Not supported</td>
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<tr>
<td>IEM* GSCMP -&gt; EM</td>
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<td>0.484</td>
<td>0.078</td>
<td>6.16</td>
<td>0.000</td>
<td>supported</td>
</tr>
<tr>
<td>QIS* GSCMP -&gt; EM</td>
<td>0.941</td>
<td>0.941</td>
<td>0.006</td>
<td>14.926</td>
<td>0.000</td>
<td>supported</td>
</tr>
</tbody>
</table>

Note: EP-Environmental Performance, GKMC- Green Knowledge Management Capability, GSCM- Green Supply Chain Management Practices, IEM- Internal Environment Management, ISCP- Internal Supply Chain process, QIS-quality information system, p<0.05

Figure 1. Indirect effect
Conclusion

The main objective of the study is to investigate the moderating effect of green Supply chain management practices (GSCM), Internal Environment Management (IEM) internal supply chain process (ISCP), quality information system (QIS), green knowledge management capability (GKMC), and environment performance (EP) of pharmaceutical industry of Thailand. To achieve this objective, following hypothesis was formulated. The key findings of the study reported that direct effect of the study has shown that all the exogenous variables have a significant and positive association with the EP of the pharmaceutical industry of Thailand. In addition, indirect effect of the study also shows that GSCMP has a significant moderating effect in most of the exogenous variables and EP of pharmaceutical industry of Thailand. These findings show that GSCMP is considered to be significant moderating in the exogenous and EP of pharmaceutical industry of Thailand. The key findings also show that GSCMP is significantly moderates on the relationship of GKMC and EP. One of the possible reasons for this relationship is that there is overlapping of other variable between this relationship. On the other hand, one of the other reasons is might be a that respondents are given the importance of GSCMP for this relationship.

This study offers some valuable managerial implications for the managers in the pharmaceutical industry regarding how they can maintain and improve the green supply chain management practices and improve their overall environmental performance. This study has reported the role of managing knowledge to improve the supply chain and environmental performance. Furthermore, the managers will be able to utilize the findings for the more deeply integration of green concept in the supply chain. It will also help the managers to reduce their organizations’ impact on the environment. While the study has successfully accomplished its objectives though there are some limitations as well which must be taken under consideration while results interpretation. Firstly, this study only considered the pharmaceutical industry, so it serves as an opportunity for the future studies to segregate the study sample regarding their nature of business such as trading, manufacturing and supporting accessories of the electronics industry. It will provide a comparative view regarding the perceptions of managers/owners in the same industry with different nature of business regarding the green supply chain management practices. Further it is suggested that the data should be collected from more respondents (like employees) in similar industry or other industry. Moreover, collection of data from different supply chain partners will provide more valuable insights regarding the green supply chain management practices. In addition, the study was consisting of cross-sectional research design, therefore a future research could be established that should be longitudinal in nature.

References


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Sustainable Development Facets: Factors Affecting Quality of Education

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Abstract. Education is an inevitable aspect for any country and without it; no country can flourish and grow effectively. Therefore, the quality of education must not be compromised. As the impact of human development, public spending on education and trained teachers’ availability is being studied in context of quality of education, a whole study and research plan has been prepared by the author. Data collection process involves the gathering of data from Asian countries for 25 years from reliable data bases. After data collection, several tests and approaches were used for the analysis of data. LLC unit root test was applied for order of integration and stationarity of data, Kao cointegration test was applied to find out cointegrated and long run relationships between the variables and finally DOLS estimation approach was used to measure the relationship between the variables. According to the results of these tests, it has been found that the variables that have significant impact on quality of education include human development, public spending on education, trained teachers’ availability and literacy rate. In the last, several theoretical, practical and policy making implications have been discussed by the author. Different limitations have also been identified and future research recommendations have also been given for the assistance of other researchers.

Keywords: quality of education; human development; public spending on education; trained teachers’ availability; Asia


JEL Classifications: P46

1. Introduction

There unanimous agreement among development economists that education is closely linked with sustainable development (Baltgailis, 2019; Humbatova, Gadim-Oglu Hajiyev, 2019). Education is considered as a main driver of human capital, as it assists in enhancing the productivity of labour, increasing efficiency and increasing the output of economy (Jermsittiparsert & Sawasdee, 2012; Ahmed, Arshad, Mahmood, & Akhtar, 2017; Rungsrisawat & Jermsittiparsert, 2019). According to Akareem and Hossain (2016), education is a key driving force behind economic development of any country.

In almost all of Asian countries, it is believed that education results bringing economic prosperity and growth. Due to this reason, it is important to design effective education policy and the key focus must be on teachers, investments and public expenditures (Zeichner & Bier, 2017). Ansell (2015) stated that nowadays, both public as well as government give much importance to spending on education. People have started giving importance to getting education and there is a high pressure on management of educational institutions to keep the quality
of education high (Zeichner & Bier, 2017).

In most of Asian countries, the quality of education is not that much high and there is a need of identifying those factors due to which quality of education gets reduced. The human resource plays a key role in education sector, so this study focuses on analysing the impact of human development and trained teachers on quality of education (Zein, 2016). In addition to this, another key factor which must be studied as a determinant of quality of education is public spending on education (Biersteker, Dawes, Hendricks, & Tredoux, 2016). It is not always possible to provide quality education to students through having highly skilled and talented teachers, but along with this, there is also a need of high spending from public on education. In order to get high quality education, it is the responsibility of general public to spend considerable amount of money on education of their children. When parents of students make payments and do some expenditure on their children’s education, then this helps in enhancing overall quality of education. When public spends on education, then the financial resources provided by them can be used to enhance the overall education system (Birchler & Michaelowa, 2016; Jabarullah and Hussain, 2019). Previously, there has been no study conducted to examine the combine effect on human development, trained teachers and public spending on quality of education in Asian context. Hence, the current study has been carried out to fill this gap through specifically focusing on Asian context. The study is focused on achieving following objectives;

- To analyze the key influence of human development on quality of education.
- To study the effect of availability of trained teachers on quality of education.
- To examine the key impact of public spending on education on quality of education.

In order to ensure significant contribution towards economic growth, it is important for the government and management of educational institutions to provide high quality education to students. So, this research study is quite beneficial for Asian educational institutions in getting an understanding that how quality of education can be enhanced through giving importance to trained teachers and human capital. Along with this, general public can also understand that how they can get high quality education through giving importance to spending on education. As, no study has been carried out to analyse the relationship between effect of trained teachers’ availability, human development as well as public spending on education on quality of education. So, the present research has significant academic implications, in terms of adding value to the literature. The present research project has been divided in to five main chapters; introduction, literature review, methodology, results and analysis and conclusion.

2. Literature Review

2.1 Availability of Trained Teachers and Quality Of Education

In an education sector, poor quality is resulted because of the presence of untrained as well as uncertified teachers. In Asian countries, there are less number of trained and qualified teachers, particularly in rural areas due to which students are not provided with quality education (Boccanfuso, Larouche, & Trandafir, 2015). Due to lack of availability of skilled and trained teachers, they do not become able to provide quality education to students. Besides this, untrained teachers also have low motivation level, and they do not fulfill their job responsibilities effectively and efficiently (Zaman, 2015). It is not possible to bring improvement in learning outcomes of students, without giving importance to inadequacies faced by teachers regarding their talent and skills. The training of teachers on regular basis is considered to be highly important, because it helps in enhancing skills and competencies of teachers. In the academic field, there is a need of learning new concepts and things on regular basis, which is not possible without trainings. Hence, trained teachers play an important in ensuring quality of education (Bui & Nguyen, 2016). It has been argued by (Dutta & Sahney, 2016) that it is not possible to achieve learning for all children without having professional and talented teachers. The teaching style is also linked highly with talents of teachers. Some teachers do not engage their students during the class and this most commonly results in low learning level of students (You & Morris, 2016). The successful learning environment requires trained teachers and for ensuring high quality of education, it is important to equip teachers with content knowledge as well as knowledge of learning-promoting teaching methods (Hanushek, 2016). It is important
to revise teaching methods and make teachers completely trained. Being trained teachers, it is important for them to use innovative methods for enhancing overall quality of education (Tandon & Fukao, 2015). The success of education depends highly on teachers who are involved in providing education to students. Hence, it is important to have skilled and talented teachers, in order to provide quality education to students (Ganimian & Murnane, 2016). The skills and competencies of teachers depend on having opportunity of getting trainings on regular basis. The human development is crucial for successful provision of education to students. It is important to analyze the important role played by teachers in enhancing quality of education. It is not possible for an educational institution to provide quality education to teachers, if the teachers engaged in providing education to students are not properly trained. The training of teachers is considered to be highly important for ensuring success of educational institutions. The trained teachers play a key role in providing high quality education to students and they have the capability of making students capable of getting excel in their academic career and this in turn also makes them capable of excelling in professional career (Hakooma & Seshamani, 2017).

According to the research of Ifa and Guetat (2018), it has been found that teachers are an important facilitator of quality education in all educational institutions. As a result of expanding both primary and secondary level education, it has become highly important to attract and train highly talented teachers. The quality of education gets negatively influenced due to shortage of skilled and competent teachers, particularly in science and mathematics. Ip et al. (2016) claimed that one of the key challenges is that many teachers do not have required knowledge as well as professional environment for performing effectively and efficiently. The professionalism of teachers gets influenced through lack of teaching competencies as well as lack of availability of learning materials. Moreover, Kapur and Perry (2015) found that even if teachers have an ambition of teaching well, then they usually experience different personal limitations, like poor living conditions, due to which their performance at school gets reduced.

**H1**: There is a significant impact of availability of trained teachers on quality of education in Asia.

**Human Development and Quality of Education.** In the field of education, the human development is considered to be highly important. It is not possible for teachers to give their maximum input in enhancing quality of education, without giving importance to human development (Landry et al., 2017). Logli (2016) argued that when teachers are not provided with the chance of getting developed, then they most probably prefer to leave the profession. The development of teachers is considered to be highly important for ensuring increased learning of students. The human development of teachers gets affected through providing them training opportunities. According to Sulisworo, Nasir, and Maryani (2017), when teachers get training, then their capability gets enhanced and they prefer to continue this profession for longer time period. With the help of getting training and development opportunities, the skills and competencies of teachers get enhanced and they provide quality education to students. According to Masino and Niño-Zarazúa (2016) training of teachers is highly important in current environment, for coping with the changing demands of profession. Trained teachers get better position of educating the students. The knowledge of a teacher can be improved with the help of training. There can be no underestimation of development and growth of teachers. Training and development is highly important for development of students and this in turn has a positive effect on quality of education (Smith & Joshi, 2016). It is not possible to improve the quality of education system, without focusing on human development. It has been argued by (Mukminin, Rohayati, Putra, Habibi, & Aina, 2017) that teachers play an important role within the education system, that without teachers, it is not possible to successfully formulate and implement policies. Human development is important for ensuring high quality of education system. Moreover, (Mundle, 2017) claimed that training of teachers is highly important for those teachers who recently initiate their teaching profession. With the help of human development, the students’ learning gets significant enhanced. Students get the most benefit through the human development in the field of education. When teachers are not provided with training, then their skills and competencies level’ do not get enhanced and they do not become capable of bringing improvement in students’ educational performance (Shimeles & Verdier-Chouchane, 2016).

**H2**: There is a significant impact of human development on quality of education in Asia.
2.2 Public Spending on Education and Quality of Education

Public spending is something which is considered to be highly important for bringing improvement within the education sector. When general public spends money on education, then that money can be used within the education sector for the purpose of development (Nowak & Dahal, 2016). Even though, spending from government is also important, but along with this, there is also a responsibility of public to make financial contribution in order to enhance overall quality of education (Ogundari & Awokuse, 2018). In addition to this, Phan and Coxhead (2015) argued that public spending on education is important in order to increase the availability of resources. Financial support from general public is important because it can make the resources available, which are required for providing quality education to students.

**H3**: There is a significant impact of public spending on quality of education.

3. Methodology

3.1 Data

Being an important step in a research process, data has been collected by the author in a very careful manner. This data has been collected in context of Asian countries such as Japan, China, Indonesia, Vietnam, Hong Kong, Thailand, Singapore and Malaysia. The period for which data has been collected is 25 years. Reliable and authentic databases such as World Bank and Global Economy have been used by the author to ensure quality of data and its results. The variables for which data has been collected include quality of education, human development, public spending on education and trained teachers’ availability. Other than these variables, two control variables have also been used in this study i.e. literacy rate and population.

3.2 Model Specification

After the collection of data, the next step is to define the units of all the variables that have been involved in the study by the author. In the current study, we are investigating the impact of human development, public spending on education and trained teachers’ availability on the quality of education in Asian countries in the presence of two control variables i.e. literacy rate and population. The measurement units and notations of all the above-mentioned variables are given here. The quality of education (EDU) will be measured by the satisfaction level of students. Human development HD will be measured in terms of an index, called as human development index. Public spending on education PSE will be measured in terms of the percentage of spending by people. In the same way, the measurement units of trained teachers’ availability TTA are the percentage of total teachers. The first control variable, literacy rate LIT will be measured as the percentage of literate people in the country and finally the measurement units of population POP will be millions. In this way all the variables will be measured and by using them a regression equation has been developed by the author that is given below:

\[
EDU_{it} = \alpha + \beta_1 HD_{it} + \beta_2 PSE_{it} + \beta_3 TTA_{it} + \beta_4 LIT_{it} + \beta_5 POP_{it} + \varepsilon_{it}
\]

In this equation, EDU represents quality of education, HD shows the term of human development, PSE represents public spending on education, TTA shows trained teachers availability, LIT is the literacy rate, POP denotes population while \(\varepsilon_{it}\) is the term that represents error.

3.3 Estimation Procedure

3.3.1 Panel Unit Root Test

In the estimation procedure, the first step is to recognize the order of integration of variables as well as the stationary and non-stationary state of the variables. Unit root tests are used for this purpose. The most commonly used unit root tests include ADF, DF, LLC, IPS etc. The importance of these tests is that they provide better and accurate results as compared to the traditional unit root tests (Levin, Lin, & Chu, 2002). They also overcome the
size and power related issues of the traditional tests and provide normal and standard distribution of the collected data as well. It must be noted here that unit root tests are based upon the existence of two kinds of hypotheses. The null hypothesis suggests that unit root exists while the data is nonstationary. On the contrary, alternate hypothesis suggests that unit root does not exist while the data is stationary. The results of these tests are evaluated on the basis of acceptance and rejection of these hypotheses. The most important tests in this regard are Levis Lin Chu LLC and Im Pesaran Shin IPS tests. The basic difference among these tests is that LLC shows homogeneous autoregressive process while IPS shows heterogeneous autoregressive system. Based on the type of data collected, the author has employed LLC unit root test in this study, the equation of which is presented below:

\[ \Delta y_{i,t} = a_i + \rho y_{i,t} - 1 + \sum_{j=1}^{p_i} a_j \Delta y_{i,t-j} + \epsilon_{i,t} \]

Here is the difference that \( \Delta y_{i,t} \) shows for \( i \)th country for the specific time period of \( t \).

### 3.3.2 Panel Cointegration Test

After the order of integration and stationarity of the variables has been identified, the author will then apply cointegration tests to the collected data. The basic aim of this test is to find out any cointegrating as well as long run relationship between the variables. Kao and Pedroni are the two most commonly used tests of cointegration. These cointegration tests are further divided into two approaches called as within dimension approach and between dimension approach (Im, Pesaran, & Shin, 2003). The within dimension approach involves four types of test statistics i.e. \( v \)-statistic, rho-statistic, PP-statistic and ADF-statistic. In the very same fashion, between approach also involves three types of statistics i.e. rho-statistic, PP-statistic and ADF-statistic. It must be noted here that PP statistic is nonparametric while ADF statistic is parametric. Just like unit root tests, cointegration tests are also based on null and alternate hypothesis. The null hypothesis in this regard shows no cointegration while the alternate hypothesis shows the presence of cointegration. Based on the acceptance and rejection of these hypotheses, the long run equilibrium relationships can be identified and investigated. As the authors has selected Kao cointegration test to be used in this study, its equation is given as follows:

\[ y_{i,t} = \alpha_i + \delta_{i,t} + \beta_1 x_{1,t} + \beta_2 x_{2,t} + \ldots + \beta_n x_{n,t} + \epsilon_{i,t} \]

### 3.3.3 Coefficient Estimation Test

Once the order of integration and cointegration has been investigated in the variables, the author will then use the coefficient estimation techniques to measure the relationship between the variables. For this purpose, ordinary least square approach is usually used but OLS shows some issues such as serial correlation and existence of endogenous variable (Pedroni, 2001). These issues can be resolved by altering OLS and generating two forms from it i.e. dynamic OLS and fully modified OLS (DOLS and FMOLS). The results of these tests have certain coefficients of variables that represent the magnitude of the relationships existing between them. There are two specific conditions, which when fulfilled make these tests provide more accurate and authentic results. The first condition is that there must be only one cointegrating vector present among the variables of first order integration. The other condition in this regard is the there must be no cointegrating vector present among the explanatory variables. As the author has employed DOLS coefficient estimation test, its equation can be presented as follows:

\[ \hat{\beta}_{FM} \left( \sum_{i=1}^{N} \sum_{t=1}^{T} (x_{Lt} - x_{i})^2 \right)^{-1} \sum_{i=1}^{N} \sum_{t=1}^{T} (x_{Lt} - x_{i}) \hat{E}D \hat{U}_{Lt} - T \hat{E}U \]

In this equation, \( \hat{E}D \hat{U}_{Lt} \) is the transformed variable of quality of education due to endogeneity correction while \( \hat{E}U \) represents the serial correlation correction by FMOLS.
4. Empirical Analysis

4.1 Results of Panel Unit Root Test

As discussed in the earlier portion of this study, the first step is to find out the order of integration of the variables of the study. The author had applied LLC unit root test for this purpose and its results are presented in table 1 below. This table shows that there are two different sections for which the test has been applied separately. These sections include level and first difference. The level series shows that all the variables have accepted the null hypothesis but public spending on education as well as population has rejected the null hypothesis. This acceptance of null hypothesis by more variables indicated that in level series the data is nonstationary because the unit root is present. When the variables were first differenced, it can be seen in the table that all the variables have rejected the null hypothesis. This rejection of null hypothesis by all the variables indicates that the data in first difference series is stationary. This shifting from non-stationary to stationary data is based on the concept of first difference. The results got from this test can be concluded by stating that the data is nonstationary in level series while it becomes stationary in the first difference series (see table 1).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Level</th>
<th>1st Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDU</td>
<td>-2.8363</td>
<td>-5.5231***</td>
</tr>
<tr>
<td></td>
<td>(0.334)</td>
<td>(0.002)</td>
</tr>
<tr>
<td>HD</td>
<td>-3.2846</td>
<td>-7.2468**</td>
</tr>
<tr>
<td></td>
<td>(0.826)</td>
<td>(0.013)</td>
</tr>
<tr>
<td>PSE</td>
<td>-4.2864**</td>
<td>-12.423***</td>
</tr>
<tr>
<td></td>
<td>(0.042)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>TTA</td>
<td>-2.0421</td>
<td>-11.421***</td>
</tr>
<tr>
<td></td>
<td>(0.536)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>LIT</td>
<td>-5.6342</td>
<td>-13.634**</td>
</tr>
<tr>
<td></td>
<td>(0.532)</td>
<td>(0.004)</td>
</tr>
<tr>
<td>POP</td>
<td>-4.7424**</td>
<td>-14.874***</td>
</tr>
<tr>
<td></td>
<td>(0.032)</td>
<td>(0.000)</td>
</tr>
</tbody>
</table>

In this table, * represents that the rejection is one percent significant, ** shows that rejection is five percent significant, *** shows that rejection is ten percent significant.

4.2 Results of Panel Cointegration Test

After finding out the stationary and non-stationary state of the collected data, the author then applied Kao cointegration test to find out the cointegrating and long run relationship between the variables in the study. The results of Kao Cointegration test have been presented in the table 2. The results of tests in both within dimension and between dimension approach have been given in the table. It can be seen that in within approach, three out of four statistics have rejected the null hypothesis of no cointegration. In the same way, the between dimension approach shows that two out of three statistics have rejected the null hypothesis of no cointegration. When these results are compiled, it comes out that total of five statistics out of seven have rejected the null hypothesis. As the null hypothesis suggested the absence of cointegrated relationships between the variables, so from the results it can be concluded that cointegrated relationship is present among the variables that have been under study in this research. In addition to cointegrated relationship, the long run equilibrium relationship has also found to be present between these variables. An important point that must be noted here is that ADF (parametric) and PP (non-parametric) statistics have more significance in this context which further affirms the presence of significant relationship between the variables.
Table 2. The KAO Panel Cointegration Test

<table>
<thead>
<tr>
<th>Alternative hypothesis: common AR coefs. (within-dimension)</th>
<th>Weighted</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Statistic</td>
</tr>
<tr>
<td>Panel v-Statistic</td>
<td>-2.283472</td>
</tr>
<tr>
<td>Panel rho-Statistic</td>
<td>4.913768**</td>
</tr>
<tr>
<td>Panel PP-Statistic</td>
<td>-12.13879*</td>
</tr>
<tr>
<td>Panel ADF-Statistic</td>
<td>-4.183691*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Alternative hypothesis: individual AR coefs. (between-dimension)</th>
<th>Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group rho-Statistic</td>
<td>6.286489*</td>
<td>0.0000</td>
</tr>
<tr>
<td>Group PP-Statistic</td>
<td>-21.13689</td>
<td>0.0000</td>
</tr>
<tr>
<td>Group ADF-Statistic</td>
<td>-2.813691**</td>
<td>0.0431</td>
</tr>
</tbody>
</table>

In this table, * represents that the rejection is one percent significant, ** shows that rejection is five percent significant

4.3 Results of Coefficient Estimation Test

Once the order of integration and the long run relationships have been found out, the next step is to measure the relationship that is present among the variable. The author has used DOLS coefficient estimation technique for this purpose. The results of DOLS technique have been given in the table 3 of the study. It can be seen in the table that the impact of human development is significant on quality of education by 5 percent significance level. In other words, quality of education will rise by 22.9% with increase in one percent of human development. In the same way, the impact of public spending on education has also been found significant is supposed to increase the quality of education by 28.4% with one-unit increase. The third variable, trained teachers’ availability has also significant impact on quality of education and will raise it by 13.6% with one percent increase. Apart from these variables, the impact of control variable, literacy rate has also been found as significant. From these results, it can be concluded that human development, public spending on education, trained teachers’ availability and literacy rate have significant impacts on quality of education.

Table 3. DOLS Regression

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>HD</td>
<td>0.227942**</td>
<td>0.2444</td>
<td>3.284689</td>
<td>0.0000</td>
</tr>
<tr>
<td>PSE</td>
<td>0.284797*</td>
<td>0.5634</td>
<td>4.283694</td>
<td>0.0004</td>
</tr>
<tr>
<td>TTA</td>
<td>0.136104**</td>
<td>0.1334</td>
<td>4.297247</td>
<td>0.0003</td>
</tr>
<tr>
<td>LIT</td>
<td>0.284697*</td>
<td>0.0032</td>
<td>1.497359</td>
<td>0.2774</td>
</tr>
<tr>
<td>POP</td>
<td>0.834968</td>
<td>0.3532</td>
<td>2.358799</td>
<td>0.0001</td>
</tr>
<tr>
<td>Constant</td>
<td>0.482319</td>
<td>0.6534</td>
<td>3.539739</td>
<td>0.0002</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.284694</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.137684</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F-statistic</td>
<td>32.28369</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prob(F-statistic)</td>
<td>0.000000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Durbin-Watson stat</td>
<td>2.247924</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In this table, * represents one percent significance level, ** shows five percent significance level
5. Discussion and Conclusion

5.1 Discussion

The basic aim behind this study was to find out the impact of human development, public spending on education and trained teachers’ availability on quality of education in Asian countries. To achieve this aim, several hypotheses were developed and tested. The first hypothesis was that the human development has significant impact on quality of education. This hypothesis has been accepted by the results and is in accordance with the past study (Havighurst, 1953). The next hypothesis was that public spending on education has significant impact on quality of education. This hypothesis has also been accepted and this result is same as shown by the past study (Ablo & Reinikka, 1998). The last hypothesis was that the trained teachers’ availability has significant impact on quality of education. This final hypothesis has also been accepted by the author on the basis of the results of data analysis. This result is in concordance with a past study (Sindelar, Daunic, & Rennells, 2004). In the last, the impact of a control variable, literacy rate has also been found as significant in context of quality of education. This same result has been seen in a previous study (Kickbusch, 2001).

5.2 Conclusion

Being an important factor of the economic growth of a country, the importance of education has been increasing day by day. In the current study, the impact of human development, public spending on education and trained teachers’ ability is being studied on the quality of education of Asian countries. For this purpose, a research was designed, and data was collected from different Asian countries for 25 years. This data was subjected to different tests such as LLC unit root, Kao cointegration and DOLS estimation test. The results of these tests showed that the impact of human development, public spending on education and trained teachers' availability is significant on quality of education. Similarly, the impact of control variable, literacy rate has also been found as significant. There are many theoretical, practical and policy making implications of this study.

5.3 Implications

Several theoretical, practical and policy making implications and benefits of this study have been identified. Firstly, it will provide enough literature and information about human development, public spending patterns on education and trained teachers’ ratio along with the quality of education. This will help them in their researches and studies. Apart from this, it will also provide guidance to the education department of the country to take certain actions to improve the quality of education in country, which is the need of the hour for almost every country in the world. Finally, it will also provide assistance to the policy making department of the government in order to devise policies that are favorable for education in the country. This will increase the quality of education in the country that will have an ultimate impact on the growth of the country.

5.4 Limitations and Future Research Indications

Several limitations associated with this study have been discussed here. In addition, some future research indications and recommendations have also been given for the guidance of the future researchers. First of all, the sample size in this study is very small and it can be increased effectively by other researchers. The data has been collected from Asian countries. Other researchers may consider other countries or regions for data collection purpose. Moreover, the variables that are involved in this study are fixed which may be changed by the other researchers in their studies. The last point is that the future researchers may also apply tests other than those that have been used in this study. In this way, other and future researchers may improve the quality of their researches.
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Abstract. The article is devoted to the study of cybersecurity as a component of the national security of the state. It has been established that the development of information and telecommunication technologies testifies to the progress of society but also determines the security risks of their use. In particular, this refers to a cyberattack and other cyberthreats. It has been determined that cybersecurity should be understood as the protection of the vital interests of a person and citizen, society and the state when using cyberspace. An important role in ensuring such a security is played by the cyberthreat protection mechanism, which provides for the development and adoption of a cybersecurity strategy, the creation of a national cybersecurity system, strengthening of the security and defense sector’s capabilities to effectively combat military cyberthreats, cyberterrorism, and ensuring cyberprotection of state electronic information resources and information infrastructure. The existence of the Cybersecurity Strategy of Ukraine and other acts as the legal basis for countering cyberthreats has been noted. In turn, the national cybersecurity system provides for the activities of the Ministry of Defense of Ukraine, the State Service for Special Communications and Information Protection of Ukraine, the Security Service of Ukraine, the National Police of Ukraine, the National Bank of Ukraine, and intelligence agencies. In turn, in France, Finland, Germany, the central place in the cybersecurity system belongs to the National Cybersecurity Agency, the National Cybersecurity Center, and the Cyberdefense Center, respectively. Despite Ukraine’s significant steps towards increasing cybersecurity in the state, there is no public-private cooperation in this area. Due to this, authorized entities should establish cooperation with the non-state sector and establish effective institutional and legal instruments for such cooperation. At the same time, the issue of public-private cooperation in the field of cybersecurity is relevant for all states of the world in view of the global nature of existing cyberthreats.

Keywords: national security; cybersecurity; cyberdefense; cyberthreats; cyberattack; information; information infrastructure

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JEL Classifications: F35; F42

1. Introduction

The development of information and telecommunication technologies leads to a number of security risks for their use. So, more than half of the world’s population uses the Internet. By the end of 2018, 51.2% of the world’s population, which is equivalent to 3.9 billion people, uses the Internet. This is an important step towards a more global information society, but it also demonstrates the need for enhanced cyberdefense. According to data provided by ITU Connect, by 2023, 70% of the global population will be free to use the Internet, which once again demonstrates the need for more cybersecurity.
At the same time, the significant threats to the safe use of the Internet for searching, storing, and disseminating information, conducting banking transactions and other transactions, software of work of enterprises, institutions, organizations are cyberthreats, including cyber-attacks. In particular, not so long ago, Ukraine faced another cyberattack, possibly the most serious in its history. The virus designated as «Petya», «Petya.A», «PetrWrap», «GoldenEye», «Diskcoder.C» quickly spread among Ukrainian systems, temporarily disabling government agencies, airports, media companies, delivery services, and even radiation monitoring systems at the former Chernobyl nuclear power plant. At the same time, the damage was caused to a number of companies in the USA, the Russian Federation, Great Britain, France, and Australia (Nekrasov V., Polyakova A., 2017). Such a situation testifies, firstly, to the current dependence of a number of processes on computer technologies, and, secondly, to their insecurity in Ukraine from cyberattacks. This is confirmed by the fact that, according to official data, the National Cybersecurity Index in the state as of 2018 is 58.44%. That is, Ukraine is only 50% ready to prevent fundamental cyberthreats and combat cybercrime, develop a national cyberdefense policy, and provide electronic identification and signature services (National Cybersecurity Index, 2018).

The study of the issue of cybersecurity as a component of the national security of the state is no a coincidence, since today the cyberattack designated as Petya, Petya.A, PetrWrap, GoldenEye, Diskcoder.C have clearly demonstrated the existing gaps in ensuring cybersecurity not only in Ukraine but also in other countries of the world. So, due to the globalization of cyberspace, all states without exception are interested in safe cyberspace.

2. Literature Survey

Zine Homburger points out that the cybersecurity capacity development is a way to empower people, communities and governments’ capabilities to achieve their development goals by reducing the digital security risks associated with accessing and using information and communication technologies. This definition emphasizes not only the development of the state’s potential to achieve the desired level of cybersecurity but also minimizes the negative consequences of the use of information and computer technologies (Homburger, 2019).

However, despite the fact that the perception of cybersecurity as one of the priority areas of national security is widespread among both developed and transitional states in the modern globalized world, today there is no single definition of the term «cybersecurity» in scientific doctrine (Drobyzko et. al., 2019a, 2019b). Thus, G.V. Foros and K.S. Kondrasheva note that cybersecurity is the security of information and information infrastructure in the digital environment, and information security allows achieving such goals as confidentiality of information; the integrity of information and related processes; availability of information; monitoring of all such processes” (Foros G.V., Kondrasheva K.S., 2016). In turn, Miguel Ferreira Da Silva notes that in France cybersecurity is considered as the desirable state of information systems, in which they may be confronted with external factors that could threaten the availability, integrity or confidentiality of stored, processed or transmitted data, as well as the related services the systems provide (Da Silva, 2016).

Rossouw von Solms and Johan van Niekerk focus on the fact that cybersecurity is the protection of cyberspace, electronic information, information and computer technologies that support cyberspace, as well as a person as a user of cyberspace. The given understanding of the concept of “cybersecurity” automatically separates it from the essence of another similar definition “information security”. According to scientists, vivid examples of existing threats that relate exclusively to cybersecurity, and not information security, include: (a) cyberbullying, which has become a major issue in modern society, as modern technology is increasingly used for bullying, provoking violence and causing psychological harm; (b) smart home that became possible due to the emergence of new technologies that allow controlling the home on a remote basis, which is convenient enough, at the same time this advantage is posed by a significant threat that an unauthorized person will gain unauthorized access to the home by breaking the security system of the technologies use (Sitdikova & Starodumova, 2019); (c) digital media, according to the data, it is the entertainment industry that announces more losses annually because of the possibility of unauthorized distribution of films, songs, gaming applications, directly damages the copyright holders; (d) cyberterrorism, most often encroaching on critical infrastructure objects, protection of which is an important component of cybersecurity policy (Rossouw von Solms, Johan van Niekerk, 2013). All this indicates that cybersecurity covers a wider range
of issues than information security. In turn, information security, for example, may consist of unlawful access, disclosure, and destruction of information that is recognized as bank secrecy, which occurs among employees of banks and banking institutions (Klochko, A.N., Kulish, A.N., Reznik, O.N., 2016).

Complementing the rather comprehensive classification proposed by scientists, Sharikov Pavel A. emphasizes at least three elements that each, without exception, cyberthreat contains: (1) sources; (2) goals and (3) means of implementation of cyberattacks. In doing so, all components of cyberthreats must be taken into account when developing a robust cybersecurity strategy (Sharikov, Pavel A., 2019).

In order to create the necessary conditions for the safe functioning of cyberspace and for its use in the interests of the individual, society, and the state, it is necessary not only to develop a cybersecurity strategy but also as it is emphasized by Tomas Plėta, Sergii Karasov, Tadas Jakštas: (a) to create a national cybersecurity system which N. Tkachuk considers as the totality of all entities ensuring state cybersecurity, the mechanism of their interaction and coordination, a set of measures to protect against cyberthreats, counter cyberterrorism, and cyberintelligence, as well as the legal framework governing the field of cybersecurity (N. Tkachuk, 2018); (b) to strengthen the capabilities of the security and defense sectors to ensure the effective fight against military cyberthreats, cyberespionage, cyberterrorism and cybercrime, and to deepen international cooperation in this field; (c) to ensure cyberprotection of state electronic information resources, necessary information, as well as information infrastructure.

3. Methods

Ensuring the cybersecurity of the state is a complex process, in which more than one authorized entity must participate using more than one method. Among such methods, it is necessary to single out, first of all, the legal method, which allows correctly determining the theoretical foundations of protecting cyberspace and creating a legal framework for the activities of entities of the national cyberdefense system. The activities of the relevant public and private entities are the result of the use of the organizational method, which allows, based solely on the current state of cyberspace of the state, determining the need for new entities, creating them and providing all conditions for their effective functioning. One should not forget about technological methods because without software and technologies it will be impossible to counteract cyberthreats.

Thus, the protection of the state’s cyberspace is a systematic activity of the state, which is based on such legal, organizational, and technological methods.

4. Results

The Law of Ukraine «On Basic Principles of Ensuring Cybersecurity of Ukraine» dated 5 October 2017 defines cybersecurity as the protection of the vital interests of a person and citizen, society and the state when using cyberspace, which ensures the sustainable development of the information society and digital communication environment, timely identification, prevention and neutralization of real and potential threats to the national security of Ukraine in cyberspace. In turn, the legislator of Ukraine relates the following points to the cybersecurity objects: (1) constitutional rights and freedoms of man and citizen; (2) society, sustainable development of the information society and digital communication environment; (3) the state, its constitutional system, sovereignty, territorial integrity, and inviolability; (4) national interests in all spheres of life of an individual, society and state; (5) critical infrastructure facilities (Law on the Fundamentals of Cybersecurity of Ukraine, 2017).

Thus, article 17 of the Constitution of Ukraine stipulated that protecting the sovereignty and territorial integrity of Ukraine, ensuring its economic and information security are the most important functions of the state, the business of the entire Ukrainian nation (Constitution of Ukraine, 1996). At the same time, although cybersecurity is not explicitly mentioned in this constitutional norm, even though only the most important areas of protection are taken into account, it can be concluded that cybersecurity is an integral part of information security.

The Law of Ukraine «On Information» provides that the main directions of state policy in the information sphere include, in particular: (a) assurance of access to information for everyone; (b) ensuring equal
opportunities regarding the creation, collection, receipt, storage, use, distribution, security, protection of information; (e) creation of conditions for the formation of an information society in Ukraine; (d) assurance of the openness and transparency of the activities of entities of power; (e) creation of information systems and information networks, the development of electronic management; (f) continuous updating, enrichment, and storage of national information resources; (g) assurance of information security of Ukraine; (h) the promotion of international cooperation in the information sphere and the entry of Ukraine into the global information space. However, it is obvious that, in this normative legal act, the legislator focuses exclusively on the concept of “information security” (Law of Ukraine on Information, 1992). Therefore, it is advisable to pay attention to other normative legal acts and provisions of the scientific doctrine, which pay attention to the existing cyberspace threats, as well as a list of measures that should be implemented to minimize them.

In particular, the National Security Strategy of Ukraine approved by the Decree of the President of Ukraine «On the decision of the National Security and Defense Council of Ukraine dated 6 May 2015, «On the National Security Strategy of Ukraine» dated 26 May 2015, identifies among the main threats to cybersecurity and the security of information resources: (1) vulnerability of critical infrastructure facilities, state information resources in cyberattacks, (2) the physical and moral obsolescence of the state secret protection system and other types of information with the restricted information (National Security Strategy of Ukraine, 2015).

Mykola Syomych, Iryna Markina, Dmytro Diachkov highlight, in accordance with the National Cybersecurity Index, the following cyberprotection weaknesses in Ukraine: (a) lack of protection of digital services (lack of responsibility of providers for digital services), cybersecurity standards for the public sector and the competent cybersecurity oversight body) (b) lack of cybercrisis management practices at the national level, indifference to international activities in the field of cybercrisis management, lack of operational support for volunteers during the cybercrisis; (c) lack of military cyberoperations (lack of units to implement military cyberoperations, indifference to international initiatives, lack of experience in conducting military cyberoperations) (Mykola Syomych, Iryna Markina, Dmytro Diachkov, 2018).

![Figure 1. System of entities of the national cybersecurity system of the country according to the Cybersecurity Strategy of Ukraine 2016](image-url)
Although the main directions of achieving the necessary operational and other capabilities of the components of the country’s security and defense sector as a whole have been emphasized in the decision of the Council of National Security and Defense of Ukraine dated 4 March 2016 «On the Concept for the Development of the Security and Defense Sector of Ukraine», it is worth highlighting among them also those related specifically to cybersecurity, in particular: improving public administration and management of the security and defense sector, including: (a) information and cybersecurity systems; (b) information protection and information resource security systems; (c) intensification of the fight against military cyberthreats; (d) cyberespionage; (e) cyberterrorism; (f) cybercrime; (g) deepening international cooperation in this area (Concept for the development of the security and defense sector of Ukraine, 2016).

In addition to the general National Security Strategy of Ukraine, the Cybersecurity Strategy of Ukraine was also approved, which in particular defines the entities of the state’s national cybersecurity system (Figure 1).

Thus, the Ministry of Defense of Ukraine, in accordance with the provision approved by the resolution of the Cabinet of Ministers of Ukraine dated 26 November 2014, is the main body in the system of central executive bodies, which ensures the formation and implementation of state policy regarding the national security in the military sphere, the defense and military construction spheres during peacetime and special period. It is worth noting that only in 2019 its competence was supplemented with powers to take measures to ensure information security, cybersecurity, and cyberdefense, as well as prepare the state to repel military aggression in cyberspace (cyberdefense) (Regulation on the Ministry of Defense of Ukraine, 2014).

The structure of the Ministry of Defense of Ukraine provides for the activities of the Office of Information Technology, the purpose of which is to ensure, during peacetime and a special period, the implementation of the state policy regarding the information security, cybersecurity, and informatization in the system of the ministry, to organize and coordinate measures for the implementation of the latest information technologies, the formation of a single information infrastructure of the ministry. At the same time, the Office of Information Technologies of the Ministry of Defense of Ukraine is also involved in monitoring the information environment, identifying potential and real information and cyberthreats to the national security of Ukraine in the field of defense and assessing the level of military threat to the national security of Ukraine, conducting information and analytical activities and forecasting the development of events related to the implementation of potential and real information and cyberthreats.

The next entity of the national cybersecurity system is the State Service for Special Communications and Information Protection of Ukraine, which works today exclusively with cybersecurity issues. The main activities of the service include interaction with the UA administrative domain; protection of state information resources; interaction with public authorities and international cooperation in the field of protection of information resources; assurance of the functioning of a unified anti-virus protection system; determination of the level of protection of information systems and telecommunications.

N. Tkachuk emphasizes that the state’s cybersecurity system should be developed in accordance with existing cyberthreats, which it must counter. According to the scientist, the greatest danger to the state today is the unlawful cybernetic influence of special services of foreign states and terrorist organizations on the critical infrastructure of the state. Therefore, special attention should be paid to the status of the Security Service of Ukraine as a special-purpose law enforcement agency and its competence to prevent external and internal threats to state security, intelligence, terrorism and other illegal attacks by special services of foreign states, organizations, individual groups, and individuals on the vital interests of Ukraine, and also countering special information operations against Ukraine in cyberspace. The status of special services indicates its key role in the National Cybersecurity System of Ukraine, which is to provide counterintelligence protection of state interests in the field of cybersecurity through: (1) countering cyberespionage and cyberterrorism; (2) the detection and disclosure of cybercrime (Tkachuk, 2017; Korauš, et. al., 2019).

Along with the Security Service of Ukraine, another law enforcement agency operates - the National Police of
Ukraine as an entity of the National Cybersecurity System of Ukraine. In the structure of the police bodies, the Cyberpolice Department of the National Police of Ukraine was created. At the same time, Bereza V. suggests under the authority of the Cyberpolice Department of the National Police of Ukraine to consider the established system of legal rights (measures of possible behavior) and legal duties (measures of necessary behavior) that the Cyberpolice Department of Ukraine has in order to exercise law enforcement functions (Bereza, V. 2018). And according to information on the official website of the said body, its tasks include: (a) implementation of state policy in the field of combating cybercrime; (b) timely informing the population about the emergence of new cybercriminals; (c) the introduction of software to systematize cyberincidents; (d) responding to requests from foreign partners.

So, in 2018, the Cyberpolice Department of Ukraine conducted an investigation of criminal offenses in the field of cybersecurity - 2688, in the field of illegal content - 1139, in the field of electronic commerce – 3607, and in the field of payment systems - 3697 (Ostrovoy A.V., 2018).

With that, the practice of the activities of the relevant cyberunits in the structure of the police is not new to foreign countries. In particular, the Cybercrime Department was created in the structure of the Central Criminal Police Directorate of the Ministry of Internal Affairs of Georgia in December 2012 by the Decree of the Minister of Internal Affairs. Currently, the department has 15 investigative detectives investigating cybercrime offenses, as well as providing advice and other assistance in investigating cybercrime and handling electronic evidence by the police units throughout Georgia.

It is worth noting that the powers of the National Police of Ukraine and the Security Service of Ukraine as entities of a cybersecurity system are similar, however, the distribution of their functions is related to the sphere of responsibility of the police and special services. Thus, the National Police bodies give key attention to protecting the rights of people, companies, institutions, organizations, and the interests of the state and society against illegal actions. In turn, the activities of the Security Service of Ukraine focus on protecting only the state, its constitutional order, state security, as well as conducting counter-intelligence activities.

Taking into account such powers of the police and special services of Ukraine in the field of cyberspace protection, an important role belongs to the interaction between these entities, which A. I. Bespalova conditionally divides into internal (within the framework of police bodies and units) and external. Depending on the directions of their activity, the scientist proposes to distinguish the following types of interaction between these entities: (1) interaction regarding the counteraction to the offenses in the field of telecommunications; (2) interaction regarding the counteraction to the offenses in the field of electronic commerce; (3) interaction regarding the counteraction to the offenses in the field of fraud and legalization (laundering) of proceeds of crime, etc. (Bespalova O.I., 2017).

As to the National Bank of Ukraine in the system of entities of the cybersecurity system of Ukraine, it is worth noting that it has limited competence in the field of ensuring cyberspace since its authority in this area relates only to cybersecurity in the activities of banks. So, according to the Law of Ukraine «On the National Bank of Ukraine» dated 20 May 1999, the National Bank of Ukraine is authorized to determine the procedure, requirements, and measures to ensure cyberprotection and information security in the banking system of Ukraine and for the entities transferring funds, to monitor their implementation, and also to create the cyberprotection center of the National Bank of Ukraine, and to ensure the functioning of the cyberprotection system in the banking system of Ukraine (Law of Ukraine on the National Bank of Ukraine, 1999).

After the Petya virus blocked the work of banks, the National Bank of Ukraine adopted the Decree No. 95 “On approval of the Regulation on the organization of measures to ensure information security in the banking system of Ukraine”, which obliged banks to take measures during 2018 to strengthen their cybersecurity. In accordance with the said act, each bank must create a collective body on the implementation and operation of the information security management system («ISMS») and appoint a person responsible for information security, as well as update the information security system in accordance with international standards. Thus,
banks were required to present their updated cybersecurity systems. However, this act of the National Bank of Ukraine did not provide for special sanctions for violation of established requirements (Pavlovskaya, A., Khalimon, Z., 2018).

It is worth noting that in France, the National Cybersecurity Agency (ANSSI), whose activities are controlled by the Prime Minister, belongs to the cybersecurity and cyberdefense authorities. ANSSI recognizes that the French economy cannot develop without modern technologies and therefore directs its activities to promote safe cyberspace while maintaining user privacy in order to preserve a competitive state economy (Robert S. Dewar, 2018).

In Finland, the National Cybersecurity Center (NCSC-FI) was established in 2014 as a national body for information security, which supports government agencies, the business community, and other entities in supporting cybersecurity. The center was created by combining the functions of CERT-FI and GOV-CERT with the National Communications Security Authority FICORA (NCSA-FI). Today, the National Cybersecurity Center of Finland: (1) provides information on the real state of cybersecurity in the state; (2) detects and analyzes existing cyberthreats; (3) provides available resources and means to support authorities; (4) establishes cooperation regarding the cyberspace security issues at the national, interstate, and international levels. The Centre’s responsibilities also include responsibility for the security of the transmission and processing of classified information by electronic means (Robert S. Dewar, 2018).

The Cyberdefense Center (Cyber-AZ) also operates in Germany, which is subordinate to the Federal Office for Information Security (BSI). Within its competence, Cyber-AZ collaborates with the Federal Office for Civil Protection and Disaster Management and the Federal Office for Protection of Constitution. In addition, the activities of Cyber-AZ are comprehensively supported by the Federal Criminal Police Directorate, the Federal Police Directorate, the Federal Intelligence Service, and the military bodies. Thanks to such an extensive network of entities and cooperation between them, Cyber-AZ is an important center for the exchange of information and best practice. Accordingly, Cyber-AZ evaluates cyberattacks, identifies channels for their implementation, persons who are responsible for their perpetration, and provides relevant information with recommendations to the National Cybersecurity Council (Robert S. Dewar, 2018).

5. Discussion

In their opinion of Boes, S., Leukfeldt, E.R. the law enforcement agencies play an important role in the fight against cybercrime and it is difficult to disagree with this. However, one of the strategies to combat this type of crime is to form partnerships with private institutions themselves - formalized cooperation between government bodies and stakeholders (Boes, S., Leukfeldt, E.R., 2017).

In particular, Streltsov, Lev notes that the system of entities that have the task of ensuring the cybersecurity of Ukraine can be divided into four main groups: defense and (counter) intelligence structures, law enforcement agencies, technical protection regulators, private sector, and coordinator - the National Cybersecurity Coordination Center. Moreover, the higher the level of threat to the cybersecurity of the state, the higher the likelihood that various entities should work together. Although during the latest incident related to the spread of the Petya virus, various structures were cooperating, the meaning of such cooperation is not freely accessible to the public, and therefore it cannot be evaluated by them. Another important point is the role of the private sector in ensuring cybersecurity. In Ukraine, the sphere of public-private partnerships is only at an early stage of its foundation: the legal framework for such a cooperation is not fully developed. In addition, Ukraine still lacks specialized research institutions that can contribute to cybersecurity. At the same time, it is worth noting that these problems are not significant only for Ukraine, the issue of the functioning of public-private partnerships is discussed even in states that have an improved legal system (Streltsov, Lev, 2017).

D. Dubov, V. Boiko, S. Hnatyuk, T. Isakova, M. Ozhevan, A. Pokrovskala also note that in Ukraine today there is no public-private cooperation in the field of cybersecurity. In the context of the unsatisfactory state of cyberspace protection, this issue is becoming increasingly important. Accordingly, the priority task of the competent
authorities is to establish communication/cooperation with the non-governmental sector and effective institutional and legal tools for this type of communication/cooperation. Another problem that is relevant is the closed nature of the Ukrainian cybersecurity sector since the available information does not provide an objective picture of its status and prospects (D. Dubov, V. Boiko, S. Hnatyuk, T. Isakova, M. Ozhevan, A. Pokrovska, 2018).

At the same time, Tkachuk Nataliya draws attention not only to the problem of public-private cooperation in the field of cybersecurity but also to the fact that despite the ratification by Ukraine of the Cybercrime Convention of the Council of Europe in 2005 as an important tool of international cooperation in the fight against cybercrime, Ukraine still has an urgent need to optimize existing mechanisms for the exchange of information between entities, including a mutual legal assistance treaty to ensure a quick and adequate response to cyberthreats and investigation of cybercrimes at national and international levels (Tkachuk, Nataliya, 2018).

Conclusions

Thus, one of the significant threats to the safe use of the Internet for searching, storing, disseminating information, conducting banking transactions and other transactions, the software of enterprises, institutions, organizations is cyberthreats, including cyberattacks. Each country’s cyber-security mechanism provides for the development and adoption of a cybersecurity strategy, the establishment of a national cybersecurity system, the strengthening of the security and defense capabilities to effectively combat cyberthreats, cyberterrorism, etc., the provision of cybersecurity for state electronic information resources and information infrastructure.

In Ukraine, in addition to the Cybersecurity Strategy of Ukraine, the legal basis for counteracting and combating cyberthreats consists of the Constitution of Ukraine, the Law of Ukraine «On Basic Principles of Cybersecurity of Ukraine», the Law of Ukraine «On Information», the National Security Strategy of Ukraine, the Concept of Development of the Security and Defense Sector of Ukraine, etc. In turn, the national cybersecurity system envisages the activities of such authorized entities as the Ministry of Defense of Ukraine, the State Service for Special Communications and Information Protection of Ukraine, the Security Service of Ukraine, the National Police of Ukraine, the National Bank of Ukraine, and intelligence agencies. A special place among these entities belongs to the Cyberpolice Department of Ukraine. In turn, in France, Finland, Germany, in contrast to Ukraine, the central place in the cybersecurity system is occupied by the National Cybersecurity Agency, the National Cybersecurity Center, and the Cybersecurity Center respectively.

Despite a number of significant steps by Ukraine towards increasing the level of protection of the state’s interests against cyberthreats in the country, there is no public-private cooperation in the field of cybersecurity. The primary focus of the state’s activity in this direction should be establishing communication/cooperation with the non-state sector and establishing effective institutional and legal instruments for this communication/cooperation. At the same time, the issue of public-private cooperation in the field of cybersecurity is urgent for all, without exception, countries of the world, given the global nature of existing cyberthreats.

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SMART CITIES: IMPACT OF RENEWABLE ENERGY CONSUMPTION, INFORMATION AND COMMUNICATION TECHNOLOGIES AND E-GOVERNANCE ON CO2 EMISSION

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Abstract. Renewable energy is not only cost effective but also plays vital role in decreasing the pollution. Most of the developing countries struggle with the energy supply for the cities. The introduction of renewable energy resources will not only meet the increased city demand of energy but also helps in making the smart city. Information and communication technologies help in efficient communication and work using different soft wares. The better the Information and communication technologies services in the country the better will be the chance of generating the smart cities in Asia. Emission of CO2 contributes to the pollution and thus, the global warming. If the government, make better policies and communicate it with e-governance with the people of the country then there will be the chances of making the smart cities in the Asia. The aim of this study was to assess the impact of three dependent variables including state legitimacy, democracy and public services on the independent variables on the quality of the education. The data was collected from ten different Asian countries including are incudes Pakistan, India, China, Bangladesh, Nepal, Afghanistan, Iran, Turkey, Maldives, Indonesia, Saudi Arab, Kazakhstan, Syria, Qatar and Iraq. The timeline of the study is 26 years from 2019 and the data was collected from The Economic Form, The World Bank reports as well as the Transparency International. The analysis was performed by using IBM-SPSS and various statistical tests were applied including LLC, cointegration test diagnostic checks, correlation matrix and PCSE estimation test and sys-GMM. The results of our study showed positive association of dependent variables on the formation of smart cities in Asia. The results of our study have social, political and economic implications.

Keywords: Renewable Energy Consumption; Information and Communication Technologies; E-Governance, Co2 Emission, Asia

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JEL Classification: O3

1. Introduction

A greenhouse gas is identified as any such compound that is enough able to absorb and emit infrared radiation, therefore permitting less heat to get escaped back to space and then making a trap of it in some lower environment. Ozon, Nitrous oxide, methane, carbon dioxide (CO2) and water vapors are the major greenhouse gases present in the environment of Earth (Adapa, 2018). The emissions of CO2 is done through burning the fossil fuels for different uses (Agbali, Trillo, Ibrahim, Arayici, & Fernando, 2019; Haseeb, Wattanapongphasuk, & Jermsittiparsert, 2019). In accordance with Alonso-Gonzalez, Chacon, and Peris-Ortiz (2018), the electricity is mainly produced through burning fossil fuels, that mainly come through natural gas and coal. The emissions of greenhouse through industry mainly come through burning of fossil fuels for the purpose to acquire energy. It is also used for various other processes of industry (see figure 1).
Buildings: 9.4%
Transport: 20.9%
Power Industry: 38.5%
Non-combustion: 10.0%
Other industrial combustion: 21.2%

Figure 1. CO2 Emissions by Sector

For instance, it is used for transportation purposes. Fossil fuels are burnt for planes, trains, ships, trucks and cars. Different chemical reactions are considered important to develop products from raw items, like non-energy usage of fuels, use of dolomite and limestone. Greenhouse gas emission through homes and businesses arise mainly because of fossil fuels that is burnt for the purpose to get heat. Excluded burning of biomass of short-cycle (like burning of agricultural waste), burning of biomass of larger scale (like forest fires) and removals/emissions of carbon of land-usage are also the causes why CO2 is emitted. In accordance with (Andrés, 2019), in year 2016, there were 35,753,305,000 tons of emission of CO2. The emissions of CO2 got incremented by around 0.34 percent over the past year, depicting an increment in year 2015 of around 122,227,000 tons within Asian countries (Balogun et al., 2019). In figure 1, the trends of CO2 emission are provided.

In an attempt to overcome the climate change and energy crisis, the government present around the world and particularly within Asia are targeting on renewable energy resource. Natural resources are used for deriving renewable energy like hydro, geothermal, wind and solar energy, and some types of biomass that get replenished at much faster rate as compared to their consumption. The renewable sources of energy can provide developing countries of Asia an opportunity to accept electrification of rural regions and low pathway of carbon through off-grid solutions of renewable energy (Bhatt & Jani, 2019). Information and Communication technology mainly refers to the technology that is mainly used for the purpose to handle network-based control, transmission and processing system, broadcast media, telecommunication and intelligent building management systems. However, ICT is often identified as the synonym for IT, but still it has broader scope. Currently, within Asian countries, ICT has been used mainly to define the convergence of various technologies and using the lines of transmission carrying a diverse type of data and different formats and types of communication (Efthymiopoulos, 2016). In accordance with Gassmann, Böhm, and Palmié (2019), governance quality can be helpful for long-term development. However, there is still lesser literature on governance directions to emissions of CO2 within Asian countries. In the past, no research has been done to analyse the influence of renewable energy consumption, information communication and technology and e-governance on Co2 emissions of Asian countries. Therefore, the current research has been done to fill the gap present in literature. The research is dependent over given key objectives:

- To analyze the influence of renewable energy consumption on Co2 emissions in Asian countries
- To study the impact of information communication and technology on Co2 emission in Asian countries
- To analyze the influence of e-governance on Co2 emission in Asian countries

The outcomes of this study are beneficial for authorities of government and also for the reduction of Co2 emission in Asian countries. It will help in making the countries to get good and pollution free environment.

The division of this dissertation has been done into five major chapters. The first one is Introduction, then Literature Survey, Methodology, Analysis, Findings and Conclusion.

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2. Literature Review

Impact of Energy Consumption on Co2 emission

In accordance with Gupta, Chauhan, and Jaiswal (2019), there are difference factors that affect the alterations in the energy level linked with Co2 emissions. It has been identified that CO2 emissions within the industrial region is now a decrementing trend because of the improved fuel switching and energy efficiency. However, the intensity of energy varied a broader range and had more influence over the emissions of CO2 as compared to the coefficient of pollution. Some of the important changes that are made in the structure of renewable energy results into emissions of CO2. In the research of Hayat (2016), the intensity of energy and effect of carbon index were negatively linked. Within Iran, a one-way causal link was found in between Co2 emission and consumption of renewable energy like gas consumption and other petroleum items. However, there was no such proof that consumption of fossil fuels, petroleum products and CO2 emission resulted into economic development. Within South Africa, there is a positive influence of Co2 emission over the consumption of energy. Same like this, Khatavkar, Naik, and Kadam (2017) also depicted a positive link in between emissions of CO2 and energy consumption in eight of the Asian countries. Despite the fact that the usage of CO2 emissions per capita and within developing countries, the energy efficiency is lower as compared to that of developed ones. It is because of the reason that energy per unit is higher as compared to that in developed countries. In accordance with (Kim, 2018), in the long race, there is a positive influence of energy consumption over emissions of CO2. China is most leading one in the field of renewable energy in the entire region. Out of the entire consumption of total energy of 94,799 petajoule, the attainment of 11,282 petajoule is done through renewable energy. This implies that around 11 percent of the requirements of energy are fulfilled through renewable resources of energy. In accordance with Kim (2019), different other countries like Indonesia, Pakistan, Philippines and Sri Lanka are also fulfilling the requirements of energy through renewable energy.

H1: There is a significant impact of energy consumption on CO2 emission in Asian countries.

Impact of Communication and Technologies on CO2 emission

To classify and consolidate different applications of ICT with Green House Gases benefits in Asian countries, a tiered system is suggested (T. V. Kumar, 2017). In accordance with A. Kumar (2017) tier 1 does the differentiation between the different categories (dependent on the region in which deployment of ICT is done). These areas can be knowledge and behavior, energy supply systems, production, commerce and services, communication and transportation and smart building. The applications of ICT involve ICT services, ICT components and ICT products. This permits structural analysis that can occur within the society, like transition through economy of products to some service economy (Kumar, 2020). For instance, a company of car can do introduction of new vehicle device that assists drivers to adopt such styles of driving that decreases emissions of CO2 and does collection of data on behavioral alterations and acquire reduction in CO2 emission. The reduction in CO2 emission caused by the new system can be involved in category of transportation (Yigitcanlar et al., 2018). As different other system can also result into changes in the driving conduct and emission reduction of CO2, like intelligent systems of transport that are seen dependent over the centralized system for traffic management. The insight acquired through analyzing the influence of in-vehicle systems (referring to emissions done per kilometer driven) can help in defining appropriate parameters for integrating and assessing the intelligent solutions of transport systems (Mboup & Oyelaran-Oyeyinka, 2019). Different applications of ICT affect CO2 emission with the help of various channels, and it influence various variables. For instance an application of ICT that make improvement in building strategies can decrease the materials’ volume used through the industry of building or the composition of this (Yigitcanlar, 2016). On the other hand, deploying smarter controls within buildings can make a decrement in the operational hours of some equipment and the linked emissions (Menkhoff, Kan, Evers, & Chay, 2017; Vlasov, Grigoriev, Krivoshein, Shakhnov, Filin, Migalin, 2019; Sarma, Karnitis, Zuters, Karnitis, 2019; Vlasov, Shakhnov, Filin, Krivoshein, 2019).

H2: There is a significant impact of Information Communication and Technology on Co2 emission in Asian countries
Impact of E-governance on Co2 Emission

Different approaches of governance can impose both indirect and direct influences over the extent of emissions of CO2. One such direction of governance is the law rule. Where the law rule exists, a decrement can be made in the influences of failure of market (Prahraj & Han, 2019). Particularly, Pozdniakova (2017) identified that institutions’ quality can support more cooperation among the players of market. Ryser (2016) has stated that good institutions are the ones that protect and secure various property rights. When business get more entitlement for legal protection with the help of registration, property rights generate more of the incentives for making use of resources for the purpose of efficient development. Sánchez-Corcuera et al. (2019) has identified that institution can be weak because of lesser number of rules. Within Asia, the useful rules are enforced poorly, and it then becomes counterproductive in case when there are higher costs of enforcement and monitoring. Within Asia, the law rules become most important to comply with when referring to CO2 emissions. Where there are rules, CO2 control processes are imposed easily, and organizations do not hesitate to comply with rules. The other aspect for e-governance mainly linked with the law rule that can be significant in terms of emissions of CO2 within Asian countries is the absence of some legal procedure for enforcing the contracts of business. In accordance with Sharifi (2019), if there are no such plans of enforcement, then organizations may not comply with contract provision. Thus, it can be hypothesized that contracts’ enforcement can assist to cause more compliance-oriented organizations and such organizations that mainly comply with contracts of business tend to comply with the national policies of environment. The quality of regulatory can also influence the environmental results. In accordance with Smith, Pathak, and Agrawal (2019), heavy entry regulations for organizations in markets is linked with government having less democracy, larger unofficial economies and more corruption. Heavier regulation of activities of organization can manifested in different forms like in the form of superfluous statutes, arbitrary taxation, hidden fees for licenses and permits (Hussain et al., 2019). Asian countries developing clear guidelines in accordance with the issuance of taxation, fees charged, and permits can expect organizations to follow regulatory framework in terms of industrial management and production of industry through by-products. North Asia has argued countries present in the third world are mainly poor due to different constraints on institutions that does not motivate the activity of production (Tomor, Meijer, Michels, & Geertman, 2019). Along with it, Sureshchandra, Bhavsar, and Pitroda (2016) has stated that institution development is the major issue that is faced while doing transition and development of economies at current time. Good governance of activities of market can support the decrement of CO2 emission.

H3: There is a significant impact of e-governance on Co2 emission in Asian countries

3. Methodology

Data

The data in the present study was collected from 15 Asian countries to assess the impact of renewable energy consumption, information and communication technologies and E-governance on CO2 Emission. These Asian countries incudes Pakistan, India, China, Bangladesh, Nepal, Afghanistan, Iran, Turkey, Maldives, Indonesia, Saudi Arab, Kazakhstan, Syria, Qatar and Iraq. The data regarding dependent variables are taken from different international forums like Transparency International, The World Bank and The Global Economy. These are very reliable and authentic sources from which data has been collected. The data was collected of 26 years ending at 2019. After collection of data, the measurement units of each of the variables included in this study were determined.

Model Used

The basic motive behind this study is to investigate and check the impact that renewable energy consumption, information and communication technologies and E-governance on CO2 emission to make Asia a smart country. First of all, the variables must be classified among dependent, independent and control variables. Different approaches are used to like LLC test, diagnostic checks, correlation matrix and PCSE estimation. The
units of measurements are also included in the study. The measurement of renewable energy consumption was taken as the percentage of using the solar energy, hydroelectrically energy, geothermal energy, wind energy and energy from the biomass. The measurement for information and communication technology was taken on the basis of the number of different software’s that are used in different departments of the country. Also, the internet system like 3G, 4G and 5G technologies used in the country as well. The third dependent variable was E-Governance on Co2 Emission and it was measured on the basis of the technologies and policies used to decrease the CO₂ emission. Three controls were used in the study to compare the results of our study. First is the GDP and it was measured in terms of the annual domestic growth of the country taken in US dollars. The second control taken was population growth. It is measured in terms of number of the population increase per year of the country. The third control variable was the amount of CO₂ in the country. It is measured in the parts per millions. In this study has made a regression equation involving all the above-mentioned variables and is given as:

\[
\ln Y = \beta_0 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \beta_5 \ln X_5 + \epsilon
\]

In the above given equation, SC shows the term ready for smart city, REC shows renewable energy consumption, ICT shows information and communication technologies, EG shows E-governance on CO₂ Emission, GDP shows population, PG shows literacy rate, PCI shows per capita income and is used to represent error. The series is converted to the to the per capita and the model after the log form can be written as,

**Estimation Procedure**

To analyze the collected data, the author has used several techniques and approaches such as LLC test, diagnostic checks, correlation matrix and PCSE estimation test and sys-GMM for various purposes. The details of each of these tests are given below:

**LLC unit root**

The first test that is used in this study in order to analyze and scrutinize the collected data is unit root test. This test has been designed in order to find out the order of integration and stationarity of the variables involved in the study. Im Pesaran Shin IPS and Levin Lin Chu LLC are the most basic and important tests that are used for the above-mentioned purpose. The preference to use these tests over the old and conventional tests is based on the fact that they resolve certain issues regarding size and power of the collected data (Levin, Lin, & Chu, 2002). In addition, these tests provide normal standard distribution unlike of the old tests. In this particular study the author has employed LLC unit root test. Another important point that must be noted here is that LLC provides homogeneous autoregressive process while IPS provides heterogeneous autoregressive process. There are two types of hypotheses that are involved in these tests i.e. null and alternate hypothesis. The null hypothesis is characterized by the presence of unit root resulting in non-stationarity of data while the alternate hypothesis is characterized by the absence of unit root resulting in the stationarity of the collected data. The author has applied the following equation in order to use the LLC unit root test:

Here is the difference that shows for \( i^{th} \) country for the specific time period of \( t \).

**Diagnostic checks**

For the assessment of the data different diagnostic test are applied that are shown below:

**Heteroskedasticity**

If different number of variables are present in the population under study, then this condition is recognized as the heteroskedasticity. The absence of homoskedasticity in any data may be can be quantified by using the variance. This is important to check before applying the regression analysis and ANOVA so that the significance values of these test cannot be invalidated. The heteroskedasticity is when the random and the vector of random variable changes with time.
Autocorrelation

Autocorrelation is seen between the two-value including the function of two times and the time lag. For this autocorrelation if Pearson correlation is taken from the real or the complex data.

In this equation, E shows the expected value.

Multicollinearity

Multicollinearity is used in the regression analysis of the data. In multicollinearity the data is assessed for the presence of the variable that can act as the predictor for the other variables. By predicting linearity of that variable other variables can also be assessed.

Correlation Matrix

The correlation matrix showed the association between the two variables. This can be seen in the scattered plot as the linear line among the two variables. For this analysis two things are compared one is the interval variable and other is the ratio of the variable. In the table the value 1 will be considered as the presence of linear relationship among the variables and the 0 shows the absence of linear relationships of the variables. The number between 1 and 0 showed the strength of the model.

PCSE and Sys-GMM estimation

The panel corrected standard error is used in the time series and also in the cross-sectional data. Sys-GMM estimation is the statistical approach integrating measured economic data with population-time information to obtain estimates of uncertain economic model parameters. The Sys-GMM model corrects both the hetero and serial correlation where ad the PCSE only corrects the hetero one. In some studies Sys-GMM estimation is preferred over PCSE. These models are used to check the static and dynamic estimation of the data.

4. Results and Analysis

In our study a heterogeneous panel data approach is used for the analysis of the regression model.

LLC unit root

The results of LLC unit roots are given in the table 1. This test was applied in order to investigate the order of integration and to check the stationary properties of the variables. Whereas, in LLC test all variables except our control variables like GDP, PG and CO2 have accepted the null hypothesis this means that majority of acceptance by our dependent variables shows that in level series, unit root exists, and the data is non-stationary. But after applying the log the data became stationary by all the control and dependent variables as shown by the first differentiation series in LLC test.

Table 1. Table of LLC unit root

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Level</th>
<th>1st difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>REC</td>
<td>-1.239</td>
<td>-5.299**</td>
</tr>
<tr>
<td>ICT</td>
<td>-2.483</td>
<td>-6.299***</td>
</tr>
<tr>
<td>EG</td>
<td>-1.209</td>
<td>-9.395***</td>
</tr>
<tr>
<td>GDP</td>
<td>-8.309*</td>
<td>-10.864***</td>
</tr>
<tr>
<td>PG</td>
<td>-5.395*</td>
<td>-9.395***</td>
</tr>
<tr>
<td>CO2</td>
<td>-3.984*</td>
<td>-8.338**</td>
</tr>
</tbody>
</table>
Diagnostic checks

To check the presence of heteroskedasticity the tests applied were MW. Breusch-Pagan/Cook-Weisberg in the data. Wooldridge test was used to check the autocorrelation, Pesaran test was used to check the CD dependence and VIF test to check the multicollinearity of the variables in our data. The results of the study showed that the presence of heteroskedasticity in our data as the chi-square value was 4.74 for the MW. Breusch-Pagan test and 3.85 for the Cook-Weisberg test. Autocorrelation was also present in the data as the results of F-statistics showed the value of 5.38. The CD dependence was also present in our data. The test statistics results showed the significant value of 2.833. in our data there was no multicollinearity was present as the mean VIF values after the test came out to be 1.64. See table 2.

<table>
<thead>
<tr>
<th>Variables</th>
<th>REC</th>
<th>ICT</th>
<th>EG</th>
<th>GDP</th>
<th>PG</th>
<th>CO2</th>
</tr>
</thead>
<tbody>
<tr>
<td>REC</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICT</td>
<td>.454</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EG</td>
<td>.354</td>
<td>.584</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GDP</td>
<td>.474</td>
<td>.354</td>
<td>.354</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PG</td>
<td>.354</td>
<td>.463</td>
<td>.456</td>
<td>.454</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO2</td>
<td>.355</td>
<td>.543</td>
<td>.345</td>
<td>.455</td>
<td>.582</td>
<td>1</td>
</tr>
</tbody>
</table>

Correlation Metrix

To check the correlation matrix the Wooldridge test was applied. The results of the correlation matrix showed that renewable energy consumption is related will all the other dependent variables (information and communication technologies and E-governance on CO2 Emission) and controls (population growth, CO2 and GDP). Whereas, ICT was correlated with the E-governance on CO2 Emission and controls variables (population growth, CO2 and GDP). And the E-governance on CO2 Emission was correlated with only the controls. See table 3.

<table>
<thead>
<tr>
<th>Variables</th>
<th>REC</th>
<th>ICT</th>
<th>EG</th>
<th>GDP</th>
<th>PG</th>
<th>CO2</th>
</tr>
</thead>
<tbody>
<tr>
<td>REC</td>
<td></td>
<td></td>
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<td>ICT</td>
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<tr>
<td>GDP</td>
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<td>PG</td>
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<tr>
<td>CO2</td>
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</tbody>
</table>

PCSE estimation and Sys-GMM estimation

The results of our study showed that our use to renewable resources have significant impact on the independent variable contributing 19.4% by PCSE estimation and 18.3 in sys-GMM estimation. The information and communication technologies was significant in PCSE model give rise up to 18.3% for making Asian countries the smart cities whereas, Sys-GMM estimation showed no significance. The E-governance on CO2 Emission (EG) contributes in the smart city by 18.3% according to the PCSE estimation and 16.9% in sym-GMM estimation. GDP of the country showed no correlation in both models whereas, population growth showed 20.3% and 19.4% by PCSE and sys-GMM estimation respectively. Overall the impact of our three dependent variables is 59.3% increase on the independent variables. See table 4.
Table 4. Results from PCSE estimation and Sys-GMM estimation

<table>
<thead>
<tr>
<th>Dependent Variable = CO2</th>
<th>PCSE estimation</th>
<th>Sys-GMM estimation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>REC</td>
<td>0.194**</td>
<td>0.183**</td>
</tr>
<tr>
<td></td>
<td>(0.538)</td>
<td>(0.493)</td>
</tr>
<tr>
<td>ICT</td>
<td>0.183**</td>
<td>0.173</td>
</tr>
<tr>
<td></td>
<td>(0.548)</td>
<td>(0.593)</td>
</tr>
<tr>
<td>EG</td>
<td>0.183**</td>
<td>0.169**</td>
</tr>
<tr>
<td></td>
<td>(0.719)</td>
<td>(0.582)</td>
</tr>
<tr>
<td>GDP</td>
<td>0.101</td>
<td>0.091</td>
</tr>
<tr>
<td></td>
<td>(0.931)</td>
<td>(0.840)</td>
</tr>
<tr>
<td>PG</td>
<td>0.203**</td>
<td>0.194**</td>
</tr>
<tr>
<td></td>
<td>(0.393)</td>
<td>(0.503)</td>
</tr>
<tr>
<td>Constant</td>
<td>3.284**</td>
<td>2.848**</td>
</tr>
<tr>
<td></td>
<td>(1.020)</td>
<td>(1.002)</td>
</tr>
<tr>
<td>(R^2)</td>
<td>0.593**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.895)</td>
<td></td>
</tr>
</tbody>
</table>

| No. of Observations      | 252            |                    |
| No. of Instruments       | -              | 250                |
| No. of Observations      | -              | 250                |
| Arellano-Bond test for AR (1) (Pr W z) | - | 0.838 |
| Arellano-Bond test for AR (2) (Pr W z) | - | 0.391 |
| Hansen test of overid restrictions | - | 0.103 |

5. Discussion and Conclusion

Discussion

As the study was conducted in order to investigate and explore the impact of renewable energy consumption, information and communication technologies and E-governance on CO2 emission on the making of smart cities in Asia in presence of three control variables i.e. population growth and GDP and amount of CO2. Some hypotheses were generated for this purpose, the first hypothesis was that the use of renewable energy plays a significant role in making the smart cities in Asia. Our results prove this hypothesis and are in accordance with the (Karnouskos & De Holanda, 2009; Pieroni, Scarpato, Di Nunzio, Fallucchi, & Raso, 2018; Rehmani, Reisslein, Rachedi, Erol-Kantarci, & Radenkovic, 2018). These studies highly suggest that the use of renewable resources increases the chances of making smart cities. Our second hypothesis was that the use of information and communication technologies in the countries have significant role in the making of smart cities. Our results are in accordance with the (Battarra, Gargiulo, Pappalardo, Boiano, & Oliva, 2016; Khatoun & Zeadally, 2016) that also suggests that the use of information and technology in the country influences the formation of smart cities. Our third hypothesis was that the E-governance on CO2 Emission have significant impact on the formation of the smart cities. Our results showed association of E-governance on CO2 Emission and formation of smart cities which is in accordance with the other studies by (Ibrahim, Al-Nasrawi, El-Zaart, & Adams, 2015; Kar, Mustafa, Gupta, Ilavarasan, & Dwivedi, 2017).

Renewable Energy Consumption plays a vital role on the cost-effective energy generation. This not only decreases in the pollution of the country, global warming but also generate energy for the country. The availability of the energy that is easily available and cost effective have increase chances in the formation of the smart cities. Information and technologies play a huge role in the communication and software’s that better works and saves time of the individuals. This effective and efficient work help in the progress of the country thereby generating more smart cities. E-Governance on CO2 emission reduces the emission of the CO2 by the industries and other sources. If government, make polices and effectively communicate it to the people in the country then there will be more chances in generating smart cities in the Asian countries.
Conclusion

Our study was conducted in the data collected from the fifteen Asian countries to assess the role of renewable energy consumption, information and communication technologies and E-governance on CO2 Emission with the formation of the smart cities in Asia. Different tools were used to analyze the data including LLC, diagnostic checks, correlation matrix and PCSE and sys-GMM estimation test. The results of our study conclude that all the dependent variables have positive influence on the making the smart cities in Asia. Also, GDP have no impact on generating the smart cities whereas, population growth was significantly related to the generation of smart city. Overall, the effect of all the three dependent variables was 59.3% on the formation of the smart cities.

Limitation and implication

This study has some implications as well as some limitations. This study has provided with the literature about the impact of the three variables renewable energy consumption, information and communication technologies and E-governance on CO2 Emission on the formation of smart cities this can be considered as theoretical implication. The practical implication of the study is that the developing countries of Asia who have been struggling with renewable energy consumption, information and communication technologies and E-governance on CO2 emission should pay more heed to resolving them as this will not only make smart cities but also bring prosperity in the country. This study has also provided assistance and guidance to the policy making departments of government to make such policies and regulations that increase the implementation of these variables to enhance the formation of smart cities in these countries.

The limitation of this study includes the sample size is small and is only limited to fifteen countries of the Asia. A larger prospective study including larger sample size and more countries from different continents of the world should be included. Also, more efficient models for analysis can be used like fixed and random effect modeling.

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STATE ENVIRONMENTAL SECURITY IN NATIONAL AND GLOBALIZATION ASPECTS

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Abstract. The article is devoted to the study of the state environmental security in national and globalization aspects. It has been established that the environmental security of the state is a status of every person’s security, society, state and nature from excessive danger to the environment, i.e. the preservation and protection of vital activity, individual’s interests and his environment from negative anthropogenic and natural consequences, which is an important component of the state security. It is established that together with the concept of “environmental security” there is a concept of “environmental modernization” as overcoming of negative impacts on environment from the industrial society by transformation of the latter with help of the latest technologies. The existing threats to Ukraine’s environmental security, identified in the National Security Strategy of Ukraine in 2015 have been determined. The need for additional attention to the armed conflict in eastern Ukraine was emphasized as one of the threats to the states’s economic security, which is in line with the provisions of the United Nations Resolution “Environmental Protection in Areas Affected by Armed Conflict”. It is noted that the Ministry of Ecology and Natural Resources only formally fulfills the task of assessing the environmental status, unlike Finland and Sweden. The issue of public participation of Ukraine in environmental management is still debatable, as defined by the Law of Ukraine “On Environmental Protection”, it remains only formal, although, for example, the public is actively involved in the management of this field in China. Accordingly, it was proposed not only completing tasks by the Ministry of Ecology and Natural Resources to develop a single list of indicators at EU level for assessing the environment status, but also to involve the public in full participation in environmental management.

Keywords: suburban environment; ecology; security; environmental security; environmental monitoring


JEL Classifications: F35, F42

1. Introduction

Significant deterioration of human health, constant climate change raised the issue of ensuring the state’s environmental security in national and globalization aspects for all countries of the world without exception.

The deterioration of the environment eventually leads to the destruction of the normal order of production and life and causes serious economic losses. Thus, according to the European Environment Agency, 400,000 premature deaths occurred due to air pollution in Europe in 2016. Thus, environmental security has become an urgent social need, and environmental security studies have become widespread in the world in the face of changing in economic globalization, scientific advances, and aggravation of military threats.
According to the Green Country Rankings of 2018 ranked annually by the Center for Environmental Policy and Law of the Yale University, measuring the current efficiency in terms of natural resources management and environmental status, Ukraine takes the 109th place from 180 countries between Turkey and Guatemala, the highest developed countries took 12 positions higher than Ukraine in 2018. Although Ukraine is a leader among the post-Soviet states.

It is obvious that not all European countries have a high level of ecology, and it demonstrates the importance of the environmental security issue not only for Ukraine, but for almost all countries of the world.

2. Literature Survey

Perga T.Y pays attention that rethinking of human-nature relations has begun since the 1960s, as the environmental consequences of intensive economic development became noticeable. Accordingly, the environmental activist J. Huber firstly proposed the concept of «environmental modernization» in 1980 as the overcoming of negative environmental impacts from industrial society by transforming the latter with help of new technologies. The scientist was supported by some environmentalists from Germany and the Netherlands. J. Huber, and together with another scientist found that environmental modernization is replacing of existing industrial technologies on resource conservation technologies, which are less damaging to the nature, human health and environment (Perga, 2017).

In turn, Z. J. Li, Q. Tian and L. L. Song note that the concept of «environmental security» was firstly introduced by the International Institute for Applied Systems Analysis (IIASA) in 1989. The category of environmental security was firstly included to concept of national security in the report on the implementation of the United States National Security Strategy in 1991. According to scientists, environmental security is not limited to ecosystem security, since it affects the overall national security status, which consists of political, economic and military security (Z. J. Li, Q. Tian, L. L. Song, 2018).

Cornel Zwierlein reveals the meaning of «environmental security» through an analysis of the essence of such concepts as «security» and «environment». Thus, according to the scientist, the environment in its deep and broad sense is an environmental system in its adaptive coexistence with the (industrial) human society. Environmental security is understood by the author as protecting the state and society from direct or indirect threats to the environment (Cornel Zwierlein, 2018). According to Matt McDonald, environmental security is resilience of the ecosystem to the new demands of time (Matt McDonald, 2018).

Zurlini Giovanni and Müller Felix emphasize that environmental security is a complex, adaptive system consisting of two major components – a social one characterized by a human factor and an environmental one which has historically interacted. Accordingly, environmental security is a status of protection of vital interests of people, society, environment from dangers arising from anthropogenic and natural impact on the environment (Zurlini, Giovanni, Müller, & Felix, 2008). The same opinion is supported by Wen T., Wang J., Ma Z., Bi J., whose view is the global environmental security depends on maintaining a dynamic equilibrium between human and nature, impeded by rapid industrialization and urbanization, planet growth, economic development, and growing demand for natural resources over the last 30 years (Wen, T., Wang, J., Ma, Z., Bi, J., 2017).

Peter Hough also points out that understanding of environmental issues through the «security» category is quite debatable. First, one group of scientists supports the view that environmental issues should not be equated with the security traditionally used for military issues. And secondly, some scholars are convinced that the promotion of the concept of «environmental security» will inevitably lead to militarization of this field and the issues covered (Hough P., 2017).
3. Methods

Taking into account the existing threats to the state’s environmental security and trends for emergence of new threats, it can be concluded that protection of the state’s environmental security is carried out through methods of monitoring, analysis, generalization of environmental management, as well as legal methods.

In this case the role of legal methods is to create a legal framework for the activities of authorized entities and, accordingly, their implementation of the state policy in the field of environmental protection by methods of environmental management, as well as monitoring, analysis and generalization. Monitoring, analysis and generalization methods are key to determining the actual status of the environment through the collection and processing of information on the status of water pollution, air, soil, establishment of the list of endangered animals and plants. Analysis and generalization methods, in turn, allow this information to be analyzed and presented in a report format.

4. Results

Environmental security research is a recent phenomenon. The «International Environmental Security Resolution» adopted by the United Nations General Assembly in 1987 in response to the Chornobyl disaster is considered as a referential document. From a scientific point of view, the accepted symbiosis of ecology and security is a sectoral approach to security. The reference object in the environmental sector is environment. Thus, environmental security is a status of every person’s security, state and nature from excessive danger to the environment, i.e. preservation and vital activity protection, individual’s interests and his environment from negative anthropogenic and natural consequences, which is accordingly an important component of the state security (Sitdikova & Starodumova, 2019).

The Charter of the United Nations and the principles of international law recognize the sovereign right for each State to independently define and implement environmental and development policies and they are responsible for ensuring that activities within their jurisdiction or control do not harm the environment of other States or areas outside of national jurisdiction (Cherchyk et. al., 2019). The Declaration enshrined a number of other important environmental security provisions, in particular: (1) environmental issues are addressed in the most effective manner with the participation of all concerned citizens at the appropriate level; (2) States adopts effective environmental legislation; (3) States should develop national laws on liability and compensation for victims of pollution and other environmental damage; (4) States immediately notify other States of natural disasters or other emergencies that may lead to unforeseen adverse effects on the environment in those States (Rio Declaration on Environment and Development, 1992).

Accordingly, the states paying full attention to environmental issues today are Finland, Iceland, Sweden, Denmark, Slovenia, Spain, Portugal, Estonia, Malta, France and other countries whose environmental indicator is quite high (Fig. 1).
Considering that the environmental security of the state is a component of the state national security, it should be noted that the Law of Ukraine “On National Security” defines national security as the protection of state sovereignty, territorial integrity, democratic constitutional order and other national interests of Ukraine from the real and potential threats (National Security Law, 2018). Directly the mentioned regulatory act does not contain a list of threats to the state’s environmental security, however, they are enshrined in the National Security Strategy of Ukraine in 2015, the main threats of the state’s environmental security are: (a) excessive anthropogenic impact and high level of technogenic load on the area of Ukraine; (b) the negative environmental consequences of the Chernobyl disaster; (c) a significant amount of production and consumption waste and an inadequate level of recycling, processing and disposal; (d) unsatisfactory state of the unified state system and civil protection forces, environmental monitoring system (National Security Strategy of Ukraine, 2015).

Unfortunately the acting National Security Strategy of Ukraine does not highlight such threat to the state’s environmental security as the armed conflict in eastern Ukraine. However, the international community also pays attention to it. For example, the United Nations adopted a resolution «Protecting the Environment in Areas Affected by the Armed Conflict» in May 2016. The resolution called on all Member States to continue supporting the development and implementation of programs, projects and policies aimed at preventing or reducing the impact of armed conflict on the environment. The International Criminal Court also recognized the need to resolve this aspect of the conflict, saying that priority would be given to the prosecution of crimes under the Rome Statute, its committing and consequences of such actions are related to the environmental degradation, illegal exploitation of natural resources or illegal land disposal. Donbass has historically been a center of the industrial sector for Ukraine. Before the start of the conflict in 2014, there were more than 1,160 enterprises of mining, metallurgical, chemical, petroleum, and energy industries operating in the region. In addition, there are 1,230 kilometers of oil, gas and ammonia pipelines in the region (Korauš et. al., 2019).

Brendan Duprey and Olena Bondarenko paid attention, that it is not surprisingly, before the conflict the region was one of the most polluted in Ukraine. At the same time, the armed conflict began in 2014 had both a positive and a negative impact on the environment in the region. Because of the situation in the region, many of the enterprises have ceased their activities, which has had a positive impact on the environment. On the other hand, maintenance of these facilities has also ceased, leading to an increased risk of catastrophic failure, and continuous shelling poses serious threats to these facilities (Brendan Duprey, Olena Bondarenko, 2019).
Yevhenii Yakovliev and Sergiy Chumachenko emphasized on complication of the environmental situation in the Donbass as a potential threat to the state’s environmental security. According to scientists, the following measures by the state are extremely important today: (a) activation of environmental monitoring of the anti-terrorist operation zone, including by means of remote sensing methods; (b) study and assessment of new factors related to environmental threats in the Donbas, namely: the effects of uncontrolled flooding of cities and villages and associated hazardous surface and ground water pollution processes; subsidence and dangerous deformation of residential and industrial buildings, other structures; establishment of potential routes for pollutants migration beyond the region and even beyond Ukraine due to the rapid contamination of the Seversky Donets River due to the destruction of dams and other hydraulic constriction; (d) additional research of radiation threat to assess the hazard level; (c) taking measures to restore critical infrastructure for water supply, sewage and industrial waste treatment (Yakovliev & Chumachenko, 2017).

At the same time, as experts say, the dangerous environmental situation taking place today in the occupied territory becomes critical, which can subsequently lead to a real disaster, its consequences will affect not only the entire area of Ukraine, but also many of our neighboring countries, including the Russian Federation, Poland, Moldova, Belarus, Georgia, Turkey and other countries (National Security & Defense. Razumkov Center, 2019).

It should be agreed with Zoran Mačak, Milan Kankaraš and Dejan R. who believe that there are good reasons to be interested in environmental security in the defense structures, especially the ministries responsible for defense and the Armed Forces of Ukraine. The high level of industrial pollution and practice of incorrect disposal of existing, even nuclear waste, was recorded in the activities of the military in the so-called «transition countries». The military aims often do not meet environmental goals. Peace in the world is unlikely to be achieved without armed conflict. At the same time, during the preparation for military activities, facilities for military accommodation are constructed, training courses are held for the military, their weapons are provided, and military equipment is supplied, manufactured according to the needs of the state. The need to produce complex and multi-purpose military installations poses a number of environmental risks. From an environmental point of view, enterprises engaged in the production and testing of weapons and military equipment using a number of complex chemical, technological and engineering processes are significant pollutants of the environment. These are also munitions and explosive plants in most countries, and only nuclear, biological or chemical weapons plants in some countries. Environmental risk of contamination at manufacturing facilities may be present during the technological process and disposal of production residues (waste). Of course, the military is not the largest environmental pollutant in the world, but they do significant damage to the environment not only during the armed conflict but also in the process of preparing for it (Zoran Mačak, Milan Kankaraš, Dejan R., 2018).

At the same time, UNEP notes that there are not virtually well-established mechanisms for protecting natural resources during armed conflicts, and there are no permanent international powers to control violations and resolve environmental liability and redress in such situations. UNEP recommends that the Permanent Arbitration Tribunal, on the basis of «Optional Rules for the Reconciliation of Disputes Concerning the Environment and / or Natural Resources», resolves disputes related to environmental damage during armed conflicts and produces a consolidated report on the environmental situation of consequences of armed conflicts, which is presented annually to the General Assembly of the United Nations (Drobyazko, 2019a, 2019b).

It is worth noting that today the mechanism of environmental protection in general only is being formed, in particular the relevant state bodies and authorities are being established. Thus, the Interpol created the Committee on the Compliance with Environmental Legislation and three working groups: on crimes against wildlife; on pollution-related crimes; on crimes in fisheries in 2012. Also the Interpol established a radiological and nuclear terrorism prevention unit to expand its ongoing counterterrorism activities to address chemical, biological, radiological and overt threats (Elizabeth Florescu, Jerome C. Glenn, 2015).

In turn, the issues of formation and implementation the state policy in the field of environmental protection are
within the competence of the Ministry of Ecology and Natural Resources at the national level. In accordance with the resolution of the Cabinet of Ministers of Ukraine «On Approval of the Regulation on the Ministry of Ecology and Natural Resources of Ukraine» adopted in 2015. The Ministry provides legal regulation, namely, develops draft regulatory acts, issues regulatory acts within the powers provided by law in the field of environmental security, waste management, in particular radioactive, hazardous chemicals, pesticides and agrochemicals, environmental impact assessments, and overcoming the effects of the Chernobyl disaster on the issues of: (1) licensing conditions for conducting business activities in the field of hazardous waste management, production of particularly hazardous chemicals, the list of them is determined by the Cabinet of Ministers of Ukraine; (2) keeping records of waste disposal sites and objects generation, processing and disposal facilities; (3) control of transboundary movements of hazardous wastes and their disposal; (4) waste certification; (5) environmental security during the transport of dangerous goods and elimination of the accidents consequences occurring during their transportation; (6) the list of hazardous waste properties; (7) the list of pesticides and agrochemicals permitted in Ukraine; (8) determining the conformity of pesticides and agrochemicals with quality certificates, determining the residues of pesticides and agrochemicals; (9) carrying out an environmental impact assessment (Regulation on the Ministry of Ecology and Natural Resources, 2015).

It is worth noting that one of the tasks of the Ministry of Ecology and Natural Resources of Ukraine is to assess the impact of human activity on the environment. At the same time, the lack of technology for environmental security assessment is a significant shortage not only of Ukraine, but the whole international community, which encourages domestic and foreign researchers to develop and improve methods and approaches for assessing the integrated indicator of environmental security at the level of the country and its regions. The best calculation methodology, according to Kharlamova, G. and Nesterenko V., is a concept developed by Yale University (USA) objectively describing and assessing the environmental status of the country and the world on the whole. According to this methodology, Ukraine belongs to the group of countries with weak environmental protection emphasizing the need for research on this topic. Unfortunately, a comprehensive environmental security assessment is not carried out and there is no single environmental monitoring system in Ukraine. The first priority for ensuring environmental security in Ukraine should become the development of the scientifically justified and unified methodology for calculating the integrated indicator of environmental security (Kharlamova, G., Nesterenko, V., 2014).

Assessment of human activity impact on the environment also takes place in Finland and Sweden. In particular, Sweden has been undertaking national environmental impact assessments every year since 2007, and the Swedish National Agency for Civil Situations also conducts the environmental impact assessing of each industry. Sectoral impacts are directly integrated into the human activity assessment impact on the climate, which contains a detailed analysis of considering the impact of different future scenarios on the environmental situation in Finland (Emma Hakala, Ville Lähde, Antti Majava, Tero Toivanen, Tere Vadén, Paavo Järvensivu, Jussi T. Eronen, 2019).

Thus the impact assessing of industrial activity on environmental security in the country is a normal practice in developed countries. Therefore, granting such power to the Ministry of Ecology and Natural Resources of Ukraine is quite reasonable and justified. Although there are no other legal grounds for its implementation today. In particular, as of 2018, the priority task of the State Environmental Inspectorate of Ukraine was development, as well as coordinating with the interested central executive bodies and submission to the Ministry of Ecology and Natural Resources for consideration a draft regulatory act on improvement of organization environmental monitoring by the Cabinet of Ministers of Ukraine.

But improving the organization of environmental monitoring requires the determination of indicators of the environmental status assessment. In particular, Hongqi Zhang and Erqi Xu propose to highlight the following indicators: (1) water security: an indicator of the amount of water resources per capita; water resource utilization rate; share of water resources by types; (2) soil safety: soil erosion; desertification of land; salt-alkaline soil index; soil contamination with heavy metals; (3) atmospheric safety: air pollution by nitrogen; carbon dioxide emissions; pH of acid rain; (4) biodiversity security: the number and species of endangered plants; the number of endangered animals per 100 km2 (Zhang, Xu, 2017).
At the same time, the implementation of only formal regulation of public relations in environmental management by the state is not always sufficient in practice, where the mechanisms of citizen participation in environmental protection must actually be implemented.

5. Discussion

As part of the debate on citizen participation in the environmental security mechanism, it is worth drawing attention to the China’s experience, where the government decided to informally regulate the sphere of environmental management affected by the public, largely complementing the formal regulation promoted by the government in the field of environmental management. Public participation in environmental policy plays a crucial role in environmental protection, not only in China but also in Europe and the world in general. According to the “China Environmental Annual”, a number of public complaints and petitions of environmental protection said to the public authorities through letters, official hotlines and the Internet has grown steadily with the environmental awareness of the Chinese public from 1995 to 2014. Almost 90% of Chinese surveyed citizens expressed their willingness to pay for reducing air pollution. In addition, the recently revised Law on Environmental Protection of China firstly introduced the «Information Disclosure and Public Participation» section aimed at promoting public participation in environmental protection through information disclosure (Xinlei Yang, Xiucheng Dong, Qingzhe Jiang, 2019; Pechancová, Hrbáčková, Dvorský, Chromjaková, Stojanovic, 2019).

As for Ukraine, firstly it should be emphasized that existence of public environmental management is caused, first of all, by the need to implement the citizens’ rights to participate in the management of public affairs, as proclaimed in Art. 38 of the Constitution of Ukraine, and ensuring protection against the authorities arbitrariness, neglect and disrespect of the environmental and related rights of the population from their side (Constitution of Ukraine, 1996). Conservation of natural resources and environmental protection have only recently become integrated into social systems, with attention to environmental issues, increasing public awareness and responsibility (Moumen, Z., El Idrissi, N.E.A., Tvaronavičienė, M., Lahrach, A., 2019).

The Ukraine’s legislation also provides opportunities of conducting environmental management functions by citizens and their associations. In many cases, it regulates public participation in the environmental management process much more widely than it is required by international standards. Art. 9 of the Law of Ukraine “On Environmental Protection” enshrines the environmental rights of Ukrainian citizens. There is Art. 21 “Powers of public associations in the field of environmental protection” in Section IV of “Powers of Environmental Management Authorities” establishing the rights of public environmental associations. Based on the analysis of the legislation provisions on participation in the process of citizens and their associations’ environmental management, opportunities for participation in the environmental management processes can be divided into groups: (1) influence on environmental policy-making at different levels and participation in the environmentally significant decisions; (2) public environmental monitoring; (3) initiating and conducting environmental review; (4) implementation of public environmental control (Law of Ukraine on Environmental Protection).

Despite the existence of the above mentioned legal act, most of its important provisions have remained declarative since 1991. In particular, it is evidenced by the content of the Concept for the Implementation of the State Policies in the Field of Industrial Pollution, adopted in May 2019, which primarily focuses on the problem addressed by this document. The issue of ensuring openness and transparency of data on actual volumes of industrial pollution in accordance with international standards are indicated in this document, since such effective tools for timely and complete informing of the public on the compliance of economic entities with permits in the field of environmental protection, are absent, as well as access to actual pollution data and reporting of the entity are limited. It can be characterized as unsatisfactory the level of state control over compliance with permit conditions in the field of environmental protection and the mechanism of ensuring compliance with the requirements of environmental legislation which does not encourage economic entities to increase investments in environmental measures (Concept of implementation the state policy in the field of industrial pollution, 2019).
Conclusions

Thus, contemporary there is no common understanding of the concept of “environmental security of the state”, but significant deterioration of the environmental situation in both Ukraine and countries of the world requires the development not only of theoretical principles of environmental security, but also the introduction of effective mechanisms of environmental protection. It is worth noting that environmental security in the general understanding is the protection of the environment from rapid industrialization and urbanization, the growth of the planet’s population, economic development, and the growing human demand for natural resources.

Today, environmental security is an important component of the national security of the state as financial, military and so on. Each state, in accordance with international documents, has the sovereign right to independently determine and implement environmental and development policies and it is responsible for ensuring that activities within their jurisdiction or control do not cause damage to the environment of other states or areas outside its jurisdiction. In view of this, the National Security Strategy of Ukraine in 2015 identified threats to Ukraine’s environmental security. However, the armed conflict in eastern Ukraine has been neglected. Considering that the United Nations in the Resolution “Environmental Protection in Areas Affected by the Armed Conflict” still calls on states to support the development and implementation of programs, projects and policies aimed at preventing or reducing the impact of the armed conflict on the environment. We believe that the conflict in eastern Ukraine should be included in the list of threats to the state’s environmental security in the National Security Strategy of Ukraine 2015.

An important omission of a number of countries in the world is lack of a single agreed list of indicators of environmental safety assessment in each country. This is important given the commitment of each state to take measures to protect the environment that eliminate the possibility of harming the environment of other states. Accordingly, availability of the same indicators for all states will allow to control the status of environment in the state by other stakeholders, as well as to ensure the actual responsibility of the state for the unsatisfactory status of the environment. Accordingly, the relevant environmental institutions at the international level should pay attention to it and involve representatives of the states and competent experts in the development, harmonization and implementation of common indicators for assessing the status of the environment in the country.

Another point that deserves attention at the national and international levels is public management of the environmental protection. In particular, today most of the legislation provisions of Ukraine enshrining the rights of public environmental associations, in particular to influence the formation of environmental policy, to participate in making environmentally significant decisions, to conduct public environmental monitoring, to initiate and conduct environmental expertise; to conduct public environmental control are more formal than implemented in practice. That is why the highest authorities of Ukraine should pay attention to the implementation of real instruments of implementation of the above rights.

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THE COMBINED EFFECT OF RISK PERCEPTION AND RISK TOLERANCE ON THE INVESTMENT DECISION MAKING

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Abstract. The increase in the investment complications in the current environment has increase the need of the good quality financial advices services. Based on this, the aim of the study is being to investigate the join effect of risk tolerance (RT) and risk perception (RP) on the individual risky asset allocation decision along with the other essential variable in the context of financial advice which is consist of financial literacy and trust. For this purpose, data was collected from the 210 financial advisors of the banking sectors by using a convenient sampling technique which yield a 70% response rate. For analysis, Structural Equation Modeling (SEM) technique was employed. The SEM analysis has shown that trust has positive and significant association with the RP and FL, and FL also has a positive and significant association with the risk tolerance and while insignificant with the RP. In addition, RP and RT also have a positive and significant association with the asset allocation in the banking sector of Indonesia. Based on the findings, current study added a body of literature in the empirical findings which could become a new of area of research in future. The research limitations and future directions are also discussed at the end of the study.

Keywords: asset allocation, trust; risk tolerance; financial literacy; risk perception; banking sector; Indonesia

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JEL Classification: G1

1. Introduction

In the contemporary environment, with increasing individual wealth within the middle-and upper level earnings, it is necessary for the new investors to make a proper and significant decisions about the investment. For instance, there are maximum investments decisions which are connected along with some of the risk stages, therefore it is very essential that investments could remain compatible in the risk profiles. The reason is that the risk describing is a complex and also time-consuming, therefore for enhancing the number of the investors are turn-off to financial advisors on the behalf of assistance. Therefore, Angelini, Radivoyevitch, McCrae, and Khorana (2019) contended that recent risk assessments (RM) procedures were employed through the financial advisors for measuring the client attitude and also for risk which could remain informal as well as their validity is still arguable. Furthermore, in practice, there are various evidence is suggesting that, the advisers just pay a lot of attention on financial risk tolerance (FRT). Consequently, they are to be a probably is overlook the clients risk perception (CRP) (Wang, Keller, & Siegrist, 2011; Nasr, Alaei, Bakhshi, Rasoulyan, Tayaran, Farahi, 2019). Therefore, the unexperienced investors have been find observe a risk contrary from the financial advisers in the organizations (Costa Jr, McCrae, & Löckenhoff, 2019; Diacon, Theron, Schuurmans, Van de Wal, & Bolliger, 2004). So, this discrepancy among the risk perception of the financial advisers and also their clients could obtain a failure result in the RM process of the organizations.
Grable (2008) described that FRT is considered to be an extreme quantity of uncertainty when someone is willing towards acceptance when financial decision is make. Additionally, in the personal and customer finance this definition has been used on extensively basis in the extant literature. According to this research, FRP is defined in the way of the investors “beliefs, judgments, attitudes and approaches” for risk attributes in the investment product which is adapted from then study of that is based on the conceptualization of risk perception (RP). However, prior research is generally used on the separate influence of individual risk that is make on the decision-making without any combining effect. Nguyen, Gallery, and Newton (2016) also investigated the impact of the risk tolerance (RT) on each decision-making of the investment in the context of financial advice. While their study existing in the same context but they just pay attention on the association within the investment decisions and RT without any examining the significant character of the RP.

In the recent time, there are many evidences which are signifying an important association within the RP and RT after the “Global Financial Crisis” (GFC) in the world (Gibson, Michayluk, & Van de Venter, 2013). These studies pay more attention on the influence of the GFC on perception as well as investor’s RT in their place of clarifying in what way they operated and influenced on the risky decisions. Moved through a significant way but still there is an under-researched association among RP, RT, and investor management Nguyen et al.’s (2016) in the developing economies especially on the banking sector of Indonesia. As, this sector has a major social and economic development contribution in the Indonesia. Thus seeking this gap, the aim of the study is to examine, how could FRP affected the association among each investment decision-making and risk tolerance in the context of financial advice?

The current study was divided into the subsequent sections, “introduction, literature review, research methodology, analysis and discussions, conclusion, limitation and future direction of the study”.

2. Literature review and hypothesis development

2.1 Financial risk perception (FRP)

It is indicated that early stage of research had found theory of decision making variables like probabilities (results (gain or loss outcomes), and volatilities (volatility of returns) are the basic factor that influence on the financial risk perception (FR) (de Goeij, Van Campenhout, & Subotic, 2018; Koonce, McAnally, & Mercer, 2015; Mellers & Chang, 1994). On the other hand, as research advanced, studies are activated to searching evidence of the behavioral effects and, consequently, argued this type variable of decision-theory alone are not entirely explaining how the individuals FRP are perceive (Sachse, Jungermann, & Belting, 2012). By delivering more affluent theories, current studies engaged both kinds of the variables as of these dual theoretical perception in risk perception studies (Huber, Palan, & Zeisberger, 2019; Sachse et al., 2012; Wang et al., 2011; Yin, Chen, & Xiao, 2019). In addition Koonce et al. (2015) also found that mixture of two kinds of risk variables are well explained FRP. Table 1 remain summarizes the decision-theory FRP and also behavioral variables.

2.2 The relationship risk tolerance, risk perception and asset allocation

The current study is extending the framework of Nguyen et al. (2016) through introducing of risk perception (RP) by the way of an intervening within risk tolerance (RT) and asset allocation. Framework of dual effects of the RT, RP as well as asset allocation clarified in the following Figure one. Previous studies in the social networks context has establish the supporting proof for the positive and significant influence of strong-tied and the trusting association on affective acquisition of knowledge in the organizations (Bollen & Posavac, 2018; Levin & Cross, 2004; McCarthy & Levin, 2019). In addition, the inter-relationships within the trust and financial literacy (FL) in the framework is confirmed by the following study of (Tsai & Hsu, 2019; Tsai, 2000) and (Erdemlioglu & Joliet, 2019; Levin & Cross, 2004). In the spite of being research conducted in various contexts, these both studies are found very important positive relation among the relational as well as structural features of knowledge transfer and association, advocat-
ing that association features among parties that could support to promote the knowledge transfer (Ahmad, 2019). According to our investigation, adapted from the study of Dyer and Chu (2000) who explained the relationship and the structural features that could refers the extent of time that consumer is used in service of the financial advice. Trust in place of the relational structures that mentions towards willingness of the party which are vulnerable to the activities of a new party based on the hope that other party may perform a specific activity which is significant for the trustee, regardless for the other party capabilities of monitoring and controlling are required party (Akrout, Raies, & Woodside, 2019). Analysis of the related literature displays varies across the various contexts that construct of the trustee backgrounds (Baeckstrom, Marsh, & Silvester, 2019; Georgarakos & Inderst, 2011). The current study is conducted along with the financial advice framework, it takes over-all perspective of the client trust and also contains client trust in namely, “(1) financial adviser, (2) adviser’s institution (3) and financial adviser” (Nguyen et al., 2016). Therefore, there was remained a different conceptualizations in the FL which is consistent with the previous studies (Bollen & Posavac, 2018; Gallery, Newton, & Palm, 2011; Koh, Mitchell, & Rohwedder, 2018). Consequently we accept the broadly used definition of the Kojo Oseifuah (2010) and capability to create the informed judgments as well as also take the significant decisions about the management and use of the money.

On the other hand, when one party is trust on the other party, it is similarly that they can acquire and understand helpful information from the other (Evans, Frissen, & Choo, 2018; Hanson & Kalthoff, 2018; Levin & Cross, 2004; Levin, Whitener, & Cross, 2006). Certainly, previous studies have revealed a positive association among the knowledge transfer and trust at together the individual as well as in different context of firms’ level (Stoel & Muhanna, 2012). Moreover, trust, make sure to consistent evidence that the people are probably to gain additional knowledge from the long-term association (Lee & Moss, 2018; Mäkelä & Brewster, 2009; Nguyen, Gallery, & Newton, 2019) . Therefore, it is also hypothesized that the client trusts in service of the financial advice, and association with service that will have significant and positive association with the client FL (H1)

**H1:** In the financial advice client trust has significant relationship with the client FL of the banking industry of Indonesia

A positive and significant association between the risk tolerance (RT) and trust has been found in the extant previous studies and these studies further recommended that longer-term association to be the trusting tend (Toften & Hammervoll, 2013). The possible clarification for this association is that the trustor can gain more and better information about trustee, therefore is similarly to further trust them (Alcock & Andrlíková, 2018; Dyer & Chu, 2000; Shenkman & Shenkman, 2019; Udomkit, Ensslin, & Meinhold, 2019). In line with this, extent of the time that an individual has knowledgeable risks that remain to influence on RT of the organization (Buratti & Allwood, 2019). Accordingly, based on the previous studies the positive and significant association between RT and financial literacy (FL) has been constantly supported by (Ferreira & Dickason-Koekemoer, 2019; Gibson et al., 2013; Caplinska, Ohotina, 2019).

As, Beal and Delpachitra (2003) also stated that their study on the FL of the Australian students’ and establish that members’ who took minimum risk adverse has more skills and financial knowledge. Frijns, Koeßen, and Lehnert (2008) and Nguyen et al. (2019) also observed the effects of the self-assessed in financial skills on the choice of portfolio. Based on the previous discussion, the hypothesis (H2) is suggested:

**H2:** Client FL has significant association with the client RT in the bank sector of Indonesia.

Rahman (2019) and Olsen (2008) was reviewed the literature on the trust and reported the significant result that more trust is associated to lesser risk perception (RP) in the financial market. In the context of financial, Diacon et al. (2004) also found that trust of investor in the financial products towards key measurement of RP of individual investor in the market. In this framework, due to difficult nature in the process of investment the greatest unsophisticated investors comprehensively depend on financial advisors’ approvals in making their investment decisions (Bucciol & Miniaci, 2018; Nguyen et al., 2019; Yazdipour & Constand, 2010). Consequently, follow-
ing hypothesized (H3) is suggested that:

**H3:** The client trust in service of the financial advice has a significant association with the client RP in the banking sector of Indonesia.

In addition, evidence in extant literature recommended that the investors who have a greater knowledge about the financial manufacturing goods or remain higher familiar in the product tend could perceive the less risky product (Nguyen et al., 2019). In the same way, Wang et al. (2011) also explained in their study that German-speaking region of the Switzerland which contains on the exceeding 1200 individuals and investor also found that when the individual has a greater knowledge about the RP, then he could be able to take a good investment and assets remained perceived as minimum risky. In this way these findings indicate a negative association between RP and financial literacy as those who have more financial literacy remain more similarly with higher knowledge about products of investment. Hence, the following hypothesized (H4) is that:

**H4:** The client financial literacy has a significant association with the client RP in the banking sector of Indonesia.

Furthermore, risk-averse people are tending to the overestimate of negative outcomes, most important for them to higher perceive risk although risk- pursuing people remain similarly to overvalue the positive results subsidizing towards a risk in lower perceived of the individual (Schneider & Lopes, 1986). Sitkin and Weingart (1995), Prietzel (2019) and Martino, Rigolini, and D’Onza (2018) further explained that propensity of risk negatively affected on risk perception (RP). Moreover, in the financial services context, Gibson et al. (2013) was conducted a study over 2000 respondents from the USA as well as it is generally found in individually female and male respondents who were perceived stock in the market towards riskier at the moment matched to the time which is about the GFC remained more similarly to have less scores in risk tolerance (RT). This is supported by the previous research, a person who is opposing to taking an investment great similarly to perceive products of an investment for a risk seeker as compared to riskier. Therefore, following hypothesized (H5) is that:

**H5:** Client financial risk tolerance (RT) has significant association with the client RP in the banking industry of Indonesia.

In addition, the research in various disciplines has point out that perception have negative effect on the individual executive (Byrne, 2005; Oehler & Wedlich, 2018). For instance, Hunter (2002) conducted a study by using aircraft pilots to inspect the perception of pilot risk and also stated an important negative association amongst the perception mark of pilot risk as well as their dangerous movement involvement index which signifying that pilots who were perceive minimum risk remain probably to take a part in the dangerous happenings. Similarly, in the financial context, Byrne (2015) and Bollen and Posavac (2018) also examined the association within the customers’ perception of financial risk and asset allocation in many financial products. In addition, Byrne also found a significant correlation between investment decision and perception of financial risk. These findings advice that investors remain less invest in these types of products they were perceive higher risky as well as vice versa. Based on the previous discussions, it is hypothesized (H6) that:

**H6:** The client RP has a significant association with the asset allocation in the banking industry of Indonesia.

In addition Sitkin and Weingart (1995) also found that risk perception (RP) which is absolutely mediated the association between risky behavior and risk inclination. In addition, their results were representing that people by more risk propensity remain higher likely towards perceive the risky prime to remain of lesser risk, leading to the bigger tendency for them towards acceptance of risky option. On the contrary, individuals who are the risk-averse remain more likely have great RP that is directed them to take minimum risky choices. Furthermore, the study of Sitkin and Pablo (1992) and Sarafan, Squire, and Brandon-Jones (2019) indicates that risk tolerance (RT) (Salem et al., 2018) just not have direct effect on the asset allocation but also it indirectly by
the RP. Although, Sitkin and Pablo (1992) also found a comprehensive mediation effect of the RP and their study was not prevailing in the context of financial advice (like in our study). In addition, they also studied a connecting but various risk concept: the risk propensity is not a RT. As in the previous literature financial RT originate positively and significantly associated with the decisions of the investment (Cardak & Wilkins, 2009), the current study was examined the direct association within the asset allocation and RT as well as hypothesize that the financial RP which is mediate in the RT allocation decisions such as follows: Based on the following discussion, research hypothesis is formulated;

**H7:** Client RT has a significant association with the client RP in the banking industry of Indonesia.

**H8:** Client RT has a significant association with the asset allocation indirectly through client RP in the banking industry of Indonesia.

### 3. Research Framework

**Methodology**

The cross-sectional research design and quantitative research approach was employed in the current study.

The results of quantitative approach method are based on the self-administered questionnaire, it is limited to numbers, statistics, the measurement of data and many forms of statistical analysis. The questionnaire was designed according to the objectives, problem and hypotheses of the study to determine the relative importance of factors that may control the risk factors in the the banking sector of Indonesia. The data collected through the surveys by distributing among the 300 financial advisers’ clients of the banking sector of Indonesia by using convenient sampling technique. The total 210 questionnaires were returned back from managers which yield 70% response rate. All of the questionnaires were loaded into the Microsoft Excel, the IBM SPSS, and Smart-PLS. The five point Likert scale is used to operationalize the variables and their sub constructs.

**Measures**

In the current study, five items for the trust has been adopted from the study of (Newton, Corones, Irving, & Thomas, 2015). In addition, financial literacy was measured by six items which are following “(i) budget day to day finances, (ii) save money, (iii) manage debt, (iv) invest money, (v) plan for the financial future and (vi) save enough money for retirement”. All of these items for the financial literacy were adopted from the Mercer Financial Literacy and Retirement Preparedness Survey (2006). In addition, five items for the risk perception was adopted from the stud of. These measured the following factor, “Understanding, Worry and Loss related factor, Regulation, Attention, Trust in Product, Performance Predictability, Gain and Volatility”. On the other hand, for the risk tolerance, four items were adopted from the survey study of (Newton et al., 2015; Nguyen et al., 2016). Lastly, for the research allocation six items were adopted from the study of (Nguyen et al., 2016). There are following items which covered the asset allocation “(i) Bank deposit (fixed interest savings), (ii) units in a managed fund which buys shares (unit trust), (iii) bonds/ unsecured notes, (iv) units in a managed fund which buys property (property trust), (v) Australian shares, and (vi) international shares”.

### 4. Research Analysis and Discussion

The Partial Leat Square- Structural Equation Modeling technique was employed to analyze the results of the study. Recently, there are many researchers Patidar and Din (2018) and Ahmed, Zin, and Majid (2016) who recommended that when we want to create a novelty in the research model or want to take advancement in the existing phenomena, we should prefer to the SEM analysis The reason why the SEM-PLS is preferred our the multiple regression is that the earlier handles the multiple equations simultaneously and can produces results with a simultaneous operation by producing a relationship with all direct and intervening phenomena. Reliability analysis is performed in order to find internal consistency of the items. Cronbach’s alpha is the most
widely used in order to test the reliability level. Although there are many findings that founds that the value of composite reliability is always higher than Cronbach’s alpha. In the current study, to check the indicator factor loading and internal consistency, the minimum value for the factor loading was set 0.5, for composite reliability 0.7 and for Cronbach’s alpha was 0.7 (Hair, Hollingsworth, Randolph, & Chong, 2017). Furthermore, Average Variance Extracted (AVE) also examined as one of measure that is useful in establishing validity with the minimum value of 0.5 (Hair et al., 2017). Since by analyzing the convergent validity, it can ensure that the variables correlate well with each other within their parent factor, either mediating or dependent variable. For the discriminant validity, HTMT, cross loadings and Forner Lacker have been discussed in the previous literature (Henseler, Ringle, & Sarstedt, 2015; Henseler, Ringle, & Sinkovics, 2009). All the results for the measurement model has been depicted in the following Tables 1, 2 and 3.

### Table 1. Measurement Model

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Items</th>
<th>Loadings</th>
<th>Alpha</th>
<th>CR</th>
<th>AVE</th>
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<tbody>
<tr>
<td>Financial Literacy</td>
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<td>RP5</td>
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**Note:** FL-Financial Literacy, RT- Risk tolerance, TRU- Trust, RP- Risk Perception, AL-Asset allocation
Table 2. Fornell and Larcker Criterion for Discriminant Validity

<table>
<thead>
<tr>
<th></th>
<th>FL</th>
<th>RT</th>
<th>TRU</th>
<th>RP</th>
<th>AL</th>
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<tr>
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<td>0.736</td>
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<tr>
<td>RP</td>
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<td>0.563</td>
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<tr>
<td>AL</td>
<td>0.353</td>
<td>0.686</td>
<td>0.407</td>
<td>0.472</td>
<td>0.722</td>
</tr>
</tbody>
</table>

Note: FL-Financial Literacy, RT- Risk tolerance, TRU- Trust, RP- Risk Perception, AL-Asset allocation

Table 3. HTMT Analysis for Discriminant Validity

<table>
<thead>
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<th>FL</th>
<th>RT</th>
<th>TRU</th>
<th>RP</th>
<th>AL</th>
</tr>
</thead>
<tbody>
<tr>
<td>FL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RT</td>
<td>0.436</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TRU</td>
<td>0.533</td>
<td>0.437</td>
<td></td>
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</tr>
<tr>
<td>RP</td>
<td>0.434</td>
<td>0.51</td>
<td>0.563</td>
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<tr>
<td>AL</td>
<td>0.353</td>
<td>0.686</td>
<td>0.407</td>
<td>0.472</td>
<td></td>
</tr>
</tbody>
</table>

Note: FL-Financial Literacy, RT- Risk tolerance, TRU- Trust, RP- Risk Perception, AL-Asset allocation

Structural Model

When we assess the measurement model of the study, the next process for the analysis is to test the structural model of the study. For this purpose, the bootstrap resamples 500 techniques by using the 0.05 level of significance and 1.96 t-statistics was employed. The SEM analysis has shown that risk has a positive and significant association with the risk perception and financial literacy. On the other hand, financial literacy has insignificant association with the risk perception, while financial literacy has positive and significant association with the risk tolerance. In addition, the risk tolerance has a positive and significant association with the with asset allocation and while negative with the risk perception. On the other hand, it is also found that risk perception creates a positive and significant in the relationship of risk tolerance and asset allocation in the banking industry of Indonesia. These findings have shown that banking sector of the Malaysia is able to manage the risk. The key findings are consistent with the study of (Feng et al., 2018). The results of these findings are depicted in the following Table 4 and Figure 1.

Table 4. structural model results

<table>
<thead>
<tr>
<th>Model</th>
<th>Beta</th>
<th>SD</th>
<th>T Statistics</th>
<th>P Values</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>FINANCIAL LITERACY -&gt; RISK PERCEPTION</td>
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<td>0.061</td>
<td>0.88</td>
<td>0.379</td>
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</tr>
<tr>
<td>RISK PERCEPTION -&gt; ASSET ALLOCATION</td>
<td>0.326</td>
<td>0.07</td>
<td>4.636</td>
<td>0.000</td>
<td>Accepted</td>
</tr>
<tr>
<td>RISK TOLERANCE -&gt; ASSET ALLOCATION</td>
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<td>0.068</td>
<td>7.584</td>
<td>0.000</td>
<td>Accepted</td>
</tr>
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</tr>
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<td>0.663</td>
<td>0.508</td>
<td>Accepted</td>
</tr>
<tr>
<td>RISK TOLERANCE -&gt; RISK PERCEPTION -&gt; ASSET ALLOCATION</td>
<td>0.325</td>
<td>0.07</td>
<td>4.635</td>
<td>0.000</td>
<td>Accepted</td>
</tr>
</tbody>
</table>

Note: FL-Financial Literacy, RT- Risk tolerance, TRU- Trust, RP- Risk Perception, AL-Asset allocation
Figure 1. Structural Model of the study

Conclusion

The aim of the study was being to investigate the joint effect of risk tolerance (RT) and risk perception (RP) on the individual risky asset allocation decision along with the other essential variable in the context of financial advice which consist of financial literacy and trust. The key findings have shown that trust has a significant relation with the financial literacy and risk tolerance. In addition, the financial literacy also shown a positive and significant relationship with the RT but has an insignificant relation with the RP in the banking sector of Indonesia. In other RP is significantly intervened in the relationship of RT and asset allocation. A possible explanation for this findings is that risk that risk-avoiders tend to “overestimate negative outcomes, thus perceiving more risk, while risk seekers tend to overweigh positive outcomes, therefore perceiving less risk (Schneider and Lopes, 1986; March and Shapira, 1987 as cited in Sitkin and Weingart, 1995)”. In addition, key findings have shown that RT and RP have a negative and significant relationship which is supported by the extant literature stream Gibson et al.’s (2013). Moreover, it is found that RT and RP have positive and significant association with the asset allocation. On the other hand, the risk perception also creates a positive and significant association within the risk tolerance and asset allocation. Based on the findings of the study, the current could provide help to the financial advisor to control the risk of the organization. The current study also added a body of literature in the form of empirical findings which could become a new area of research in future. Based on the findings, current study also has several limitations, firstly, current study was limited on the banking sector, therefore, future research could be established on other financial institutions. secondly, the study was cross sectional in nature, hence a future research could be established on the longitudinal research. In addition, to check the variation in the findings, a future could be established along with the moderator in their relationship.

References


Natnaporn AEKNARAJINDAWAT is a lecturer of Doctor of Philosophy Program in Development Administration, Suan Sunandha Rajabhat University, Thailand. Her research areas are Public and Private Administration, Development Administration, and Leadership.
Abstract. The article is devoted to study of information security as a challenge of modern development of information and computer technologies. It was found that achievement of a satisfactory level of information security, which is a state of safety of balanced important interests of an individual, society and state against internal and external threats in the information sphere, is possible based on economic, organizational, technical, legal, psychological and other methods. Existing threats to the information security in Ukraine have been identified. The concept and essence of hybrid war as one of the threats to protection of information interests of an individual, society and the state are considered separately. A conclusion was made about the expediency of supplementing the Information Security Doctrine of Ukraine with such a threat as a hybrid war, which actually takes place in the east of the country. A system of information security components in Ukraine has been disclosed, among which a particular attention has been paid to the Ministry of Information Policy of Ukraine and the State Agency for Electronic Governance of Ukraine. In order to improve the mechanism of protection of the information space of Ukraine, it is proposed to differentiate at the legislative level the concepts of “information security” and “cybersecurity”, since their understanding is the basis for the formulation and implementation of the state information policy, improve international cooperation between states to exchange experience, as well as to involve general public to protect the information space.

Keywords: information; information system; information space; information and computer technologies; information security; hybrid war.

Reference to this paper should be made as follows: Chyzhmar, K., Dniprov, O., Korotiuk, O., Shapoval, R., Sydorenko, O. 2020. State information security as a challenge of information and computer technology development. Journal of Security and Sustainability Issues, 9(3), 819-828. https://doi.org/10.9770/jssi.2020.9.3(8)

JEL Classifications: F35, F42

1. Introduction

Expanding the use of information technologies, being a positive factor for development of the economy and improvement of functioning of civil and governmental institutions, simultaneously creates new challenges and threats to the national security.

For example, the UN in the Agenda for Sustainable Development till 2030 recognizes that the proliferation of information and communication technologies and global interconnection of networks, as well as scientific and technological innovations in such diverse fields as medicine and energy, offer tremendous opportunities for accelerating human progress, bridging the digital gap and shaping a knowledge-based society, as well as for development. The agenda calls for a significant increase in access to information and communication technolo-
gies and for universal and affordable access to the Internet in the least developed countries by 2020 (UN General Assembly resolution “Transforming our world: the 2030 Agenda for Sustainable Development”, 2015).

At the same time, the spread of information technology and access to the Internet create significant threats to the information space of each country in particular and the world at large. So, as of 2015, Ukraine was ranked 5th in the global web-risk ranking, following the attack of Petya virus this year, which affected energy companies, banks, government sites, etc., the anti-rating of our country in cybersecurity issues has significantly increased.

According to official information and the Internet sources, due to “Petya” virus, Ukraine’s automotive business alone suffered 20 million euros in damages. As for the whole world, the numbers are no less shocking. According to the International Monetary Fund report as per the expert estimates, economic losses from the attack of the virus “NotPetya” amounted to $850 million, and losses from all global cyberattacks amount to $53 billion.

All this is a clear testimony that the existing on national and international levels tools for protection of the information space from contemporary threats need to be updated, and the policies of all countries need to be consolidating towards development of quality standards for information space security, software that should be used by government structures, establishment of appropriate government agencies responsible for policy formulation and implementation in this field. Given the large number of issues that exist today and the magnitude of economic losses from cyberattacks, it is obvious that studying information security of a country as a challenge for the development of information and computer technologies is quite relevant (Koraüş, et. al., 2019).

2. Literature Survey

Before starting to address issues of information security, it is worth noting that, despite the demand for the problem in sociopolitical discourse, many authors point out that it is poorly highlighted in the scientific literature. While a great deal of attention has been paid to information security in the technical and economic disciplines in recent years, there is a lack of relevant research in the social sciences and humanities (Durmanov et. al., 2019 a,b).

Michael Nieles, Kelley Dempsey, Victoria Yan Pillitteri define information security as protecting information and information systems from unauthorized access, use, disclosure, disruption, modification or destruction to ensure confidentiality, integrity and accessibility. Accordingly, information by scientists is facts or ideas that can be presented (coded) in the form of various forms of data; knowledge (e.g. data, instructions) on any medium or in any form that may be communication between the entities of the system (Nieles, Dempsey, Pillitteri, 2017).

It should be agreed with Alhassan Mohammed and Adjei-Quaye Alexander that information security is of great importance today and is of interest to everyone in the world of technology, be it mobile or PC users, which is why information security is important in our daily lives and in IT industry. The range of issues that information security entails, respectively, necessitates demand for professionals with knowledge of information security. For example, a cyber-security analyst, a forensic analyst, network administrators, system administrators, software developers, and these are only part of those professionals who are in constant demand with the IT development. In this case, lack of knowledge in the field of information security and competent specialists will more likely lead to insecurity of information from unauthorized penetration of attackers (Mohammed, Adjei-Quaye, Alexander, 2017).

Today, as Awad Ali points out, information security includes the use of authentication and authorization, network security, hardware, secure software, data cryptography, etc. Moreover, information security is a crucial component in the protection of almost all information transactions, and recently, with spread of information and communication technologies, information security has also begun to embrace new areas of increasing demand, including cloud computing, smart cities, telemedicine, wireless sensor networks (Ali, 2018; Sídikova & Starodumova, 2019).
The need for information security has also arisen in the field of the introduction of such a tool as electronic declaration (Reznik, et.al., 2019). Leonov S., Yarovenko H., Boiko A., Dotsenko T. emphasize the necessity of introduction of financial monitoring information system, which will increase efficiency of the bank operation by studying all banking operations without exception, accelerate detection of suspicious activities, which will give the bank management an opportunity to reduce reputational risk and minimize losses associated with payment of a fine imposed by regulatory authorities (Leonov, et.al., 2019).

The opinion of Mykola Syomych, Iryna Markina and Dmytro Diachkov is also of interest, that there is currently a sharp rise in information security incidents that are widespread and are of significant threat to a wide range of private, corporate and public interests. The main trends in the development of the above-mentioned threats, as noted by scientists, are the following:

(1) increase in the number of cyberattacks, many of which lead to significant losses;

(2) increasing complexity of cyberattacks, which may include several steps using special methods of protection against possible countermeasures;

(3) impact of cyberattacks on most electronic (digital) devices;

(4) increasing the number of cyberattacks on information infrastructure of large corporations, important industrial sites and even governmental structures;

(5) use of different tools and methods of cyberattacks on the most advanced countries in the field of computer technology (Syomych, Markina, Diachkov, 2018).

Pelevina E.S. notes that the problem of information security is closely linked to the concepts of “international security” and “economic globalization”. Thus, a key need of the state system is the need to provide conditions necessary for its functioning and development. The rapid proliferation of weapons of mass destruction puts the world community at risk of securing and maintaining peace. The system of international law thus legally enshrined the need for peace as a global fundamental interest and placed a legal obligation on countries to uphold the idea of peace between different countries (Pelevina, 2017).

International information security, in accordance with the United Nations terminology, means protection of the global information system against terrorist, criminal and military-political threats. The discussion of this issue, raised at the Information Community and Development Conference held in Midrand (South Africa) from 13 to 15 May 1996, led to the adoption in 1998 of Resolution 53/70 at the 53rd session of the United Nations General Assembly “Advances in Information and Telecommunications in the Context of International Security”. This resolution acknowledged for the first time at the highest international level the possibility of the negative consequences of the spread and use of information technologies and tools. In this context, concerns were also raised that such technologies and facilities could be used for purposes incompatible with international security and stability. Later, similar resolutions were adopted by the UN General Assembly within several years (Pelevina, 2017).

3. Methods

Given the above, it is difficult to identify one of the methods of protecting the information space of the country. However, there should be a comprehensive approach that will include economic, legal, organizational, technical and psychological methods:

(1) the essence of economic methods lies in the understanding that information is a resource that ensures development of the society and the state, and therefore the priority of the state in the direction of information space security is to finance innovation in the control of information flows and protect information from distortion or destruction;
(2) software is developed, maintained and updated by organizational and technical methods;

(3) legal methods are aimed at normative provision of information security while maintaining the balance between state control over protection of classified information and freedom of speech, free information to citizens, respect for human and citizen’s rights and freedoms during military operations;

(4) psychological methods are used to counteract information and psychological aggression in the early stages of information warfare, prevention and prediction of cases of information and psychological aggression.

4. Results

The state information security provides protection of information and information systems from inappropriate and unauthorized activities. Therefore, it is advisable to note that the provisions of the national laws, in particular the Law of Ukraine “On Information” of 1992, which divides information depending on its content into the following types: (1) personal information; (2) reference and encyclopedic information; (3) environmental information (information on ecology); (4) product information (work, service); (5) scientific and technical information; (6) tax-related information; (7) legal information; (8) statistical information; (9) sociological information; (10) other types of information (Law of Ukraine on Information, 1992).

Based on this understanding of types of information, another legal act - the Law of Ukraine “On Basic Principles of Information Society Development in Ukraine for 2007-2015” of 2007 is the only normative act that contains the following definition of information security: “it is a state of protection of vital interests a person, society and the state, in order to prevent damage caused by incomplete, untimely and unreliable information used; negative information impact; negative consequences of the use of information technologies; unauthorized dissemination, use, breach of integrity, confidentiality and accessibility of information ”(Law of Ukraine on Basic Principles of Information Society Development in Ukraine for 2007-2015, 2007).

Although Ukrainian legislation contains a definition of “information security”, it is appropriate to note that in most post-Soviet and European countries its understanding is somewhat narrower, though similar. For example, the definition of information security in the Republic of Belarus is given in Article 4 of the National Security Concept adopted November 9, 2010 as a state of protection of balanced interests of the individual, society and the State against internal and external threats in the information sphere (National Security Concept of the Republic of Belarus, 2010).

In addition to the concept of “information security”, the Doctrine of Information Security of Ukraine of 2017 relates the following to the current threats to the national interests and national security of Ukraine in the information sphere: (1) conducting special information operations aimed at undermining defensive potential, demoralization of the armed forces of Ukraine and other military units, provoking extremist manifestations, fueling panic moods, exacerbating and destabilizing socio-political and socio-economic situation, fueling ethnic and inter-religious conflicts in Ukraine; (2) conducting special information operations in other countries by the aggressor state in order to create a negative image of Ukraine in the world; (3) information expansion of the aggressor state and its controlled entities, in particular by expanding its own information infrastructure on the territory of Ukraine and in other countries; (4) information domination of the aggressor state on the temporarily occupied territories; (5) insufficient development of the national information infrastructure, which limits Ukraine’s ability to counteract information aggression effectively and proactively perform in the information sphere to realize Ukraine’s national interests; (6) inefficiency of the state information policy, imperfection of legislation regarding regulation of public relations in the information sphere, uncertainty of strategic narrative, (7) insufficient level of media culture of the society; (8) proliferation of calls for radical action, promotion of isolationist and autonomous concepts of coexistence of regions in Ukraine (Doctrine of Information Security of Ukraine, 2017).

At the same time, the place of Ukraine in the regional and world rankings indicates that the above threats do have a negative impact on the information space in the country. Thus, according to the World Cyber Security
Index 2017, Ukraine is not in the last place among the post-Soviet states, however, it is also difficult to state the level of information security in the country (Table 1).

**Table 1. Post-Soviet states in the Global Cybersecurity Index, 2017**

<table>
<thead>
<tr>
<th>Country</th>
<th>Index</th>
<th>World rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Georgia</td>
<td>0.819</td>
<td>8</td>
</tr>
<tr>
<td>Russia</td>
<td>0.788</td>
<td>10</td>
</tr>
<tr>
<td>Belarus</td>
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<td>39</td>
</tr>
<tr>
<td>Azerbaijan</td>
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<tr>
<td>Ukraine</td>
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<tr>
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<tr>
<td>Armenia</td>
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<td>111</td>
</tr>
<tr>
<td>Turkmenistan</td>
<td>0.133</td>
<td>132</td>
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</tbody>
</table>

At the same time, the list of threats to the state’s information security, as set out in the Doctrine of Information Security of Ukraine of 2017, is not exhaustive. In particular, the by-law does not take into account such threat to the national security in the sphere of information interests as the information expansion of the aggressor state and its controlled structures. Such threat is now defined by the term “hybrid war”, which is actually used to characterize the current state of information security in eastern Ukraine.

The term “hybrid war” was first coined by Frank G. Hoffman, who used this term to characterize international conflicts that did not fit the traditional notion of waging a war. He also noted that hybrid threats are a combination of traditional and irregular tactics and strategies for warfare; involve non-governmental actors along with the use of simple and sophisticated technologies. The traditional forms of war are mixed with cyberwarfare, organized crime, irregular conflicts, terrorism.

We can also find other definitions of hybrid war in scientific literature: (a) it is an irregular war that allows use of different methods of combat at the same time and involves adaptation of the armed forces to new conditions; (b) it is a military strategy which, in addition to the conventional war, includes cyber war and involves use of nuclear, biological and chemical weapons, improvised explosive devices and information warfare; (c) it is a deliberate process of establishing external control by one entity over another, establishing total control over the area of management where information plays a crucial role (Antonyuk & Malskyy, 2016).

Speaking about hybrid war, one should agree with Anzhela Parulu that in the context of hybrid wars, all the basic information methods and tools of conventional wars are used. Hybrid war contains both military and civilian components. Certainly, the emergence of hybrid war as a new form of conflict fundamentally alters the established security architecture and casts doubt on the possibilities of existing security guarantees (Parulu, 2018).

Presently, hybrid war actually takes place in the temporarily occupied territories in Donetsk and Luhansk regions, and therefore the legislator has made an attempt to normatively regulate the specifics of state policy for securing state sovereignty in these territories by adopting the relevant law in 2018. According to this law, to ensure national security, in particular state, economic, informational, humanitarian and environmental in the Donetsk and Luhansk regions, the security and defense sector bodies, other state bodies of Ukraine, their officials take measures to restore territorial integrity of Ukraine, and provide comprehensive development of secure, economic, information-telecommunication, social and humanitarian infrastructure in the territories adjacent to the temporarily occupied territories in Donetsk and in the Luhansk regions, implement, in accordance
with the strategic defense planning documents, measures to strengthen the defense and security capabilities of Ukraine (Law of Ukraine on Features of State Policy for Ensuring the State Sovereignty of Ukraine in the Temporarily Occupied Territories in Donetsk and Luhansk Regions, 2018).

This regulatory act raises several questions, although some of them answers in part. First, it is still unclear why the legislator still does not include in the list of threats to information security the hybrid war in eastern Ukraine, and secondly, which subjects the legislator meant by pointing to the security and defense sector, other Ukrainian state authorities and their officials. Considering the above mentioned when considering information security of the state and the national and globalization aspects it is necessary to pay attention also to the subjects responsible for ensuring information security.

So, the decision of the National Security and Defense Council of Ukraine “On measures to improve formation and implementation of the state policy in the field of information security of Ukraine” of 2014 gives grounds to conclude that the subjects of information security in Ukraine are: (a) the Cabinet of Ministers of Ukraine; (b) the Security Service of Ukraine; (c) the State Special Communications and Information Protection Service of Ukraine; (d) Ministry of Foreign Affairs of Ukraine; (e) State Border Guard Service of Ukraine; (f) State Migration Service of Ukraine.

Without going into a detailed analysis of the role of each of these entities in protecting the information space from inappropriate and unauthorized activities, we suggest to emphasize only some of them. In particular, presently in Ukraine an important part of the tasks in the domain of protection of the state interests in the information sphere is entrusted to the Ministry of Information Policy of Ukraine, which, in accordance with the provision approved by the resolution of the Cabinet of Ministers of Ukraine of 2015, is responsible for:

(1) ensuring formation and implementation of the state policy in the areas of information sovereignty of Ukraine and information security of the state, in particular on issues of dissemination of socially important information in Ukraine and abroad;

(2) ensuring formation and implementation of the state policy in the field of state foreign language broadcasting;

(3) ensuring development of a system of the state strategic communications in Ukraine;

(4) ensuring implementation of mass media reforms in Ukraine on the dissemination of socially important information (Regulation on the Ministry of Information Policy of Ukraine, 2015).

However, other central executive authorities responsible for formation and implementation in other spheres also have powers in the area of information space protection. First of all, it should be noted that the State Border Service of Ukraine and the State Migration Service of Ukraine are taking measures to protect the national security of Ukraine in the information sphere when addressing issues related to residency in the territory of Ukraine of foreigners and stateless persons (journalists, cameramen, other media workers). In its turn the Ministry of Foreign Affairs of Ukraine takes measures to establish international cooperation on counteracting negative information-psychological influences and cybercrime (Decision of the National Security and Defense Council of Ukraine on measures to improve formation and implementation of the state policy in the field of information security of Ukraine, 2014).

The State Agency for Electronic Governance of Ukraine is also tasked with counteracting information threats and ensuring information security in the country. According to the Regulations on the State Agency for Informatization, approved by the Cabinet of Ministers of Ukraine in 2014, the agency:

(a) conducts digital expertise and prepares conclusions for draft regulatory acts on informatization, formation and use of national electronic information resources, development of information society, e-democracy, provision of administrative services, digital development;
(b) carries out activities, within the powers provided for by the law, related to information system of electronic interaction of state electronic information resources;

(c) informs the public about the state of development of the information society and promotes its benefits (Regulation on the State Agency for Informatization, 2014).

That is, the analysis of the above allows to conclude that Ukraine is making steps towards creating conditions for proper protection of the information space of the state, specialized normative legal acts are adopted, entities responsible for formulating and implementing state policy in the information sphere, etc. are in place, but not all scientists agree that it is sufficient.

Thus, Mykola Buchyn and Yuliia Kurus point out that despite Ukraine’s significant steps towards counteracting the country’s information security threats, it still lags in this direction. Accordingly, the scientists propose to build the information security strategy in several levels.

Therefore, the first level should cover the following information policy tools:

1. Involvement of the world community and world public opinion to identify the aggressor and its devastating consequences;

2. informing the world community about enemy attacks and the objective situation in own country;

3. strengthening counter-propaganda, national information space and formation of the operational information centers;

4. ban on mass media in the territory belonging to the aggressor’s information space in order to avoid propaganda and destructive influence on citizens;

5. maintaining a stable state of information security and a positive image of the country;

6. collaboration and exchange of experience with international organizations on combating cyberattacks and information threats.

The second level, in turn, is quite extensive and combines the system of public administration and national information infrastructure, the country’s overall defense capability, its ability to withstand aggressive attacks and maintain information, territorial, economic, socio-political, cultural integrity of the country. With regard to the third level, the involvement of the public in supporting stability of socio-political development and consolidation of citizens in general is essential here. An important role at this level also belongs to the media, which have all the tools to protect information and counteract the information war on Ukraine (Buchyn & Kurus, 2018).

5. Discussion

In today’s globalization, the issue of counteracting cyberattacks as a threat to information security has become extremely acute. Indeed, cyberattacks today are capable of causing significant damage and destabilizing information space of the country. All this led to highlight the concept of “cybersecurity”. At the same time, some scientists believe that cybersecurity is a component of information security, which only relates to counteracting malicious activity in electronic networks, while others give a broader definition to the concept of cyber security, such that is identical with the concept of information security.

To substantiate their opinion, G.V. Foros and K.S. Kondrashev point out that cybersecurity is first and foremost the security of information and information infrastructure in the digital environment, while information security is ensuring confidentiality, integrity of information and a number of related information processes (Foros
Also interesting is the position of Rossouw von Solms and Johan van Niekerk, who also differentiate between cybersecurity and information security, emphasizing that cybersecurity is the protection of cyberspace, electronic information, information-computer technologies which support cyberspace and human user of the cyberspace. While information security is protection of any information and taking measures to ensure compliance with the rules for obtaining, using and disclosing restricted information, secret information, etc. This leads to the conclusion that the term “cyber security” is different in its meaning from the definition of “information security” (Solms & Niekerk, 2013).

In turn, Rachana Buch, Dhatri Ganda, Pooja Kalola, Nirali Borad also approach cybersecurity as a set of tools, policies, security concepts, security guarantees, guidelines, risk management approaches, actions, best practices, technologies that can be used to protect the cyber environment (Buch, et.al., 2017).

With these considerations, it is necessary to distinguish between cyber security and information security at the legislative level, especially since one of the threats to the information security of the state under the State Information Security Doctrine is the uncertainty of the strategic narrative. According to the above, it is obvious that the proper understanding of these categories by the legislator will become the basis for the development and implementation of the state information security strategy, which in future will allow to minimize threats to the information interests of the country.

Conclusions

Thus, the issue of information security of the country as a state of protection of vital interests of the individual, society and the country, which prevents damage due to incompleteness, untimely and unreliable information used, negative information impact, negative consequences of the use of information technology, unauthorized dissemination, use, violation of integrity, confidentiality and accessibility of information is relevant both in national and globalization aspects.

At the same time, the level of information security in Ukraine cannot yet be considered satisfactory, notwithstanding the availability of relevant legal acts and the emergence of new entities in the system of information space protection of the state, namely the Ministry of Information Policy of Ukraine, the State Agency for Electronic Governance of Ukraine, today there are a number of threats to the information interests of the country. Such threats include information expansion of the aggressor state, insufficient development of the national information infrastructure, inefficiency of the state information policy, imperfection of legislation regarding regulation of public relations in the information sphere, insufficient level of media culture of the society, etc. A significant place in the list of threats belongs directly to the hybrid war, and therefore today the priority of the state is countering the negative tendencies of the hybrid war in the east of Ukraine. Moreover, it is crucial to strengthen international cooperation in this area with the aim of sharing experiences and involving the public in the protection of the information space.

In order to increase the level of information security of the state, the authorized entities should not only use the appropriate information policy tools, but also expand the information infrastructure to increase the state’s ability to withstand aggressive attacks, especially in the east of Ukraine, where due to armed conflict information infrastructure is damaged, destroyed or under the authority of the aggressor state, and to involve citizens in maintaining stability of the information space of the country, including media, etc.
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THE DEFENSE-INDUSTRIAL COMPLEX AS THE BASIS OF THE NATIONAL SECURITY OF THE STATE

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Abstract. The article examines the concept of the defense-industrial complex as the basis of the national security of the state, peculiarities of its structure and functioning in different countries of the world, as well as issues related to the current state and reforms in Ukraine. In particular, the essence of the concept of defense-industrial complex is determined by researching the scientific points of view of both foreign and Ukrainian scientists. Peculiarities of the structure and functioning of the defense-industrial complex in countries like the USA, France, Italy, Great Britain, Sweden, China, India and Germany were studied. It was shown which state organs in Ukraine are responsible for production and supply (sales) of weapons and military equipment. The legal status of the State Concern “Ukroboronprom” as an important component of the defense-industrial complex of Ukraine has been determined. Special attention is paid to the peculiarities of the strategy of development of the defense-industrial complex of Ukraine for the period till 2028, its main purpose and priority directions are highlighted. Key strategic goals and key strategic initiatives in the State Concern “Ukroboronprom” reform strategy are highlighted, with the aim of achieving close international cooperation in the framework of innovative tendencies and improvement of the legal framework by bringing the legislation norms to the world standards. Problematic issues in the defense industry of Ukraine that need to be addressed in order to improve the efficiency and consistency of this sector of economy were identified.

Keywords: defense-industrial complex; military defense complex; national security of the state; Ukroboronprom; Ukraine

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1. Introduction

As of today, in the developed countries, the defense-industrial complex is considered as an important component of the country’s defense and national security strategy. As one of the sectors of the national economy, the purpose of the defense-industrial complex involves development and production of defense products. Considering the fact that the defense-industrial complex is the foundation of the national security of the state, the high level of its development requires constant upgrading of production facilities, which is one of the priorities of the national security policy in many countries.

The speed of scientific and technological progress and the growing needs of socio-economic development of the country necessitate the increase of the level of competitiveness of economic entities in any sphere of
economy. The success and stability of functioning of domestic enterprises is explained by the need to identify and anticipate effective actions to adapt to the external economic environment and competitive advantages. Increasing the competitiveness of the enterprises of the defense-industrial complex is a necessary component of ensuring the national security of the country. In addition, concentration of significant intellectual potential and production resources in the defense-industrial complex, as well as support of high export potential are aimed at ensuring inflow of foreign currency to the state budget.

Transition of the enterprises of the defense-industrial complex to the market environment requires technological shifts and modernization of the industry in accordance with the world standards. Qualitative changes in the defense-industrial complex are aimed at preserving the efficiency of functioning and solving set tasks, taking into account national security interests of the country. Given the current integration processes of Ukraine’s accession to the European Union, in order to enhance the country’s defense and national security, it is important to carry out such foreign and defense policy that enables development of cooperation in the context of the European Union’s security and defense policy and, consequently, maintenance of the international security.

2. Literature Survey

Exploring the essence of the concept of defense-industrial complex, it is important to note that in the scientific literature foreign scientists use the term «military-industrial complex».

So, Nzeribe & Imam (2018) define the military-industrial complex (MIC) as an informal alliance between a nation’s military and the defense industry that supplies it seen together as a vested interest which influences public policy. The authors emphasize that the driving factor behind this relationship between the government and defense-minded corporations is that both sides benefit: (1) one side from obtaining war weapons; (2) the other from being paid to supply them (Durmanov et. al., 2019).

In turn, Byrne (2017) notes that the military-industrial complex refers to a self-sustaining politico-economic system that supports profitability in military supply, in fact in many countries, but primarily in the United States. It consists of competing and/or cooperating organizations, the maintenance of which as a whole is financially beneficial to all interested sides. At the same time, it should be noted that the current state of financing of the defense-industrial complex of Ukraine does not show its self-sufficiency, whereby the corruption at the highest levels of government is a significant factor that caused such situation. In general, as noted by Kulish A., Andriichenko N., Reznik O., political corruption is a negative phenomenon that is known not only to Ukraine but also to a number of other countries in the world, which impedes democratic and economic development of the state (Kulish A., Andriichenko N., Reznik O., 2018).

Exploring the historical origins of the concept of the military-industrial complex, Smart (2016) points out that this was to describe the configuration of interests that led business corporations and the military to increasingly close relationships.

In his research, Qureshi (2018) explains the concept of a military-industrial complex as phenomena, processes, structure, and a set of agreements that take place between the military and industry of a certain country. To design MIC as an objective reality, it is defined as a structural network between its armed forces and the political and economic complex, in which there is a regulated but relatively intense flow of technologies, finance, services and products.

In Ukraine, the concept under study is called the defense-industrial complex. The authors’ team of Avanesova et al. (2018) define the defense-industrial complex as a generator of advanced scientific, technical, technological achievements and developments, which allow to create not only advanced equipment of high-level of complexity, but also high-tech products of conversion purpose (Sitdikova & Starodumova, 2019).
Potomkina (2018) defines the defense-industrial complex as a coherent system comprising enterprises, institutions, organizations that are regarded as objects on the one hand, because they are engaged in the development and production of weapons, ammunition, military equipment, special components for them; and on the other hand, as economic entities subordinated to entities of organizational and economic authority in accordance with the powers conferred upon them by law, which participate in the placement, execution of the state defense order, have regulating and controlling functions over the activity of sub economic entities in the field of defense-industrial complex, for which they exercise normative, managerial, administrative, control functions.

According to Solopenko (2016), the defense-industrial complex is one of the most important sectors of the economy of the country that needs investment, since this complex is a means that ensures the defense capability of the country, its inviolability and protects the sovereignty of the country. The scientist also emphasizes that previously the defense-industrial complexes in many countries of the world (Ukraine is no exception) focused on ensuring the defense capabilities of the national armed forces. But today, the latest trends in the development of the world defense industry have been marked by a shift from a purely self-oriented approach to the development of a global market for weapons and military equipment as a high-yielding source (Balanovska, et. al., 2019).

It is also important to note that the concept of “defense-industrial complex” in Ukraine has been studied not only at the doctrinal level, but also has legislative support. According to paragraph 13 of Part 1 of Art. 1 of the Law of Ukraine “On national security of Ukraine” the defense-industrial complex of Ukraine for the legislator means the totality of state organs, enterprises, institutions and organizations of industry and science, which develop, produce, modernize and utilize military products, provide services in the interests of defense for equipment and provision of security and defense forces, as well as supplying military and dual-use items, providing military services during implementation of military-technical cooperation of Ukraine with other countries (Law of Ukraine On national security of Ukraine, 2018).

3. Methods

The research of the concept of defense-industrial complex as a basis of national security of the state, peculiarities of its structure and functioning in different countries of the world, as well as issues of the current state and reforms in Ukraine was carried out using dialectical, formal-legal and system-structural methods.

So, to establish the essence of the concept of the defense-industrial complex by researching the scientific points of view of both foreign and Ukrainian scientists, the dialectical method was applied.

By means of the formal-legal method, the content of the norms of some of the current normative-legal acts of Ukraine was explored, which regulate: (1) the powers of the responsible organs in matters of production and transfer (supply, sale) of arms and military equipment; (2) the legal status of the State Concern “Ukroboronprom” as an important component of the defense-industrial complex of Ukraine, as well as peculiarities of its reform; (3) strategy for development of the defense-industrial complex of Ukraine for the period till 2028, etc.

Using the system-structural method allowed to identify key strategic goals and key strategic initiatives in the reform Strategy of the State Concern “Ukroboronprom”, aimed at achieving close international cooperation within the framework of innovative tendencies and improving the legal framework by bringing legislation norms in line with the world standards (Korauš et.al., 2019).

4. Results

The defense-industrial complex is an important part of the modern research and production sectors of the world economy. The largest defense industry companies in the world are represented by multidisciplinary multilevel structures, which include specialized units whose activities are aimed at development and production of high-tech military and civilian products (Khmara, 2016).
Thus, in the United States, functioning of the defense-industrial complex is based on two main strategic directions: (1) restructuring (merger and consolidation) of enterprises; (2) diversification of production (entry into non-defense markets). It is important to note that in the process of merger, the state does not remain on the sidelines, but rather controls, because most of such agreements are regulated by antitrust law and can have a negative impact on the competitiveness of US industry on the world markets. Thus, merger of companies in the defense-industrial complex is possible, but the United States Department of Defence is monitoring that the potential for production of all types of weapons and military equipment should be kept up. To this end, direct and indirect subsidies are provided. The Department of Defense allows businesses to include restructuring costs (redundancy payments, unemployment benefits, etc.) in defense contracts. At the same time, in return for such subsidies, defense companies are expected to return savings to the state through reduced prices for their products in the future (Usachenko, 2019).

The Defense Advanced Research Projects Agency (DARPA) was created in the United States in 1958 as an agency of the US Department of Defense. DARPA’s priority is to ensure american military technology excellence over other countries in the world. DARPA annual budget exceeds USD 3 billions and it is structured into 7 major divisions: (1) Adaptive Execution Office (AEO); (2) Defense Sciences Office (DSO); (3) Information Innovation Office (I2O); (4) Microsystems Technology Office (ITO); (5) Strategic Technology Office; (6) Tactical Technology Office (TTO); (7) Biological Technologies Office (BTO) (Defense advanced research projects agency (DARPA).

In France, to provide the Armed Forces with military equipment and weapons, in the structure of the Ministry of Defense of France there is the Directorate General of Arms (Direction générale de l’armement (DGA). As a contracting authority for armament programs, the DGA is responsible for development, acquisition, and evaluation of systems that provide the armed forces. According to DGA official website, it is currently carrying out 80 armament programs. As a major partner in the international development of French companies, DGA exports arms that is 1/3 of the activity of French companies in the sector over the past ten years. In the defense sector DGA: (1) reviews armament systems to ensure their overall consistency; (2) investigates the ability to control risks to manage complex projects; (3) develops unique ways of evaluating and testing (4) pursues an industrial and technological policy with a European dimension; (5) actively contributes to the export of weapons (Direction générale de l’armement (DGA), The official website).

The major French companies that have become world leaders in the defense industry are Thales and Safran. In the field of defense and security, the armed forces, governments and global organizations task Thales to assist them in achieving and maintaining security, tactical superiority and strategic independence against any type of threat. In an increasingly unpredictable world, governments rely on the Thales experience to protect their citizens and make the world safer, from developing smart sensors and connecting soldiers in the digital battlefield to delivering solutions that protect countries, cities and critical infrastructure. In the defense industry, Thales has a strong reputation for high-performance decision-making and strong investment in key scientific fields. More than 50 countries rely on Thales solutions to protect their populations, including the United States, Canada, Latin America, Brazil, European countries (France, Germany, the United Kingdom, Italy, Spain, the Netherlands, Poland, etc.), Asia (India, China, Thailand, Japan, Malaysia, etc.), as well as Africa, Egypt, Morocco, the United Arab Emirates, etc. (Thales, The official website).

Another international high-tech defense group is Safran, a French company listed on the NYSE Euronext Paris. It is part of the French Stock Market Index, CAC 40 and the European Market Index, Euro Stoxx 50. The Executive Board that represents different companies of the Group fulfils strategic goals set by the Board of Directors. This management principle guarantees balance of power and ensures rapid response of Safran to the changing demands of the economic, financial and competitive environment. Safran offers innovative systems and equipment for armies, navies and air forces around the world. As a longtime partner of governments and their armed forces, Safran designs, manufactures and markets systems and equipment tailored to each country’s specific defense needs. Operating in today’s digital combat environment, Safran equipment guarantees efficiency and precision required for all weapons systems. Safran offers innovative solutions for navigation, optics,
tactical information and stabilization on fighter jets and transport planes, helicopters, warships and submarines, armored vehicles, artillery systems. In 2019, Safran offices are located in many countries around the world, including Morocco, the USA, Canada, Mexico, Chile, Brazil, the United Kingdom, Germany, Poland, the Netherlands, Russia, Malaysia, South Korea, China, India, Singapore, Australia (Safran, The official website).

In Italy, the global high-tech defense and security company is Leonardo, which maintains partnerships with governments, institutions and armed forces of many countries around the world. Leonardo delivers advanced dual-use products and integrated solutions: (1) to enhance global security; (2) to protect people, territories, infrastructure and information networks; (3) to promote sustainable management of the environment, urban spaces and climate. Leonardo representative offices are located in countries such as the United States, Canada, the United Kingdom, Germany, Spain, Poland, Turkey, Romania, Africa, Pakistan, Malaysia, Singapore, Japan, Korea, Thailand, Argentina, Brazil, Chile, the United Arab Emirates, etc. (Leonardo, The official website).

In the UK, BAE Systems is the leading company in the field of national security, critical information protection and infrastructure. BAE Systems employs 85,800 people in more than 40 countries and works closely with local partners to support economic development through the transfer of knowledge, skills and technology. BAE Systems offers a wide range of solutions and services that enable the military and the governments to successfully accomplish their mission. The company provides large-scale engineering, integration systems and service in the aerospace, land, marine and cyber spheres. BAE Systems provides large-scale engineering, integration systems and support services in the aerospace, land, marine and cyber fields. BAE Systems, in particular, provides ammunition, armored vehicles, and bridge equipment to the armed forces worldwide. It is important to emphasize that the company is making a significant industrial and economic contribution to the UK economy, in particular the technology sector (BAE Systems, The official website).

In Sweden, Saab is the leading company serving the world market of governments, authorities and corporations with world leading products, services and solutions from military defense to civil security. Working on every continent, this corporation is constantly developing, adapting and refining new technology to meet the changing needs of customers. By improving technological systems and solutions, Saab’s mission is to improve security in the community, its citizens and those whose job it is to support security. The most famous product in the market segment is the Gripen Multipurpose Fighter - a competitive system that can easily integrate new weapons and sensors. The corporation also offers Erieye air traffic monitoring systems, drones, countermeasures, weaponry systems, sensors, training, maintenance and support (Saab Corporate, The official website).

In the area of defense and national security, Saab works in three directions. First, the corporation deals with complex defense orders in which it acts as a direct supplier. These comprehensive solutions, which often include training, maintenance, support, are designed to maintain functionality and cost-effectiveness throughout the product life cycle. Deliveries can continue for several years after development. These systems are configured and tailored to the specific needs of each customer, and therefore often have a large proportion of customer-funded development. In addition, complex defense orders usually entail some form of industrial cooperation.

Second, Saab may be a subcontractor to a partner who has a primary contact with the end customer, for example, when supplying subsystems. Some Saab systems, such as command and control systems, are platform dependent and can be integrated with Saab products or systems or other companies’ systems. Another reason to be a subcontractor may be that the cost or other factors make it an effective strategy for establishing presence on a market.

Third, maintenance, support and training can be sold separately, without large defense orders. Consumables and spare parts also belong to this category. These products and solutions are usually sold directly to the customer. Some products and services are delivered on the same day the order is placed and for others it may take more than a year. These orders involve less customer financing than complex systems. Examples include most of Saab’s civilian offerings, as well as large-scale items such as ammunition (Saab Corporate, The official website).
In China, under the supervision of the Ministry of Industry and Information Technology, the State Administration of Science, Technology and Industry for National Defense (SASTIND) is operating. Creation of this agency was intended to strengthen the armed forces with additional personnel and more sophisticated equipment. Priority areas of activity are stockpiling supplies for the army. SASTIND’s core responsibilities are related to nuclear weapons, aerospace, aviation, weapons, vessels and electronics industry. In addition, SASTIND aims to promote prosperity of the entire country by stimulating the manufacturing industry, gaining competitive advantages through advanced manufacturing technologies. As an administrative and regulatory body for science, technology and industry for national defense, SASTIND serves the needs of national defense, the armed forces, national economy and military organizations. At the same time, it is responsible for coordinating communications and cooperation on the use of nuclear energy and space activities with countries and international organizations (the State Administration of Science, Technology and Industry for National Defense (SASTIND), The official website).

The Defense Research and Development Organization (DRDO) plays an important role in the research and development at the Ministry of Defense and the Government of India. DRDO is committed to developing advanced defense technologies and the mission of achieving independence in critical defense technologies and systems, providing the armed forces of the country with sophisticated weapons systems and equipment. DRDO was formed in 1958 by the merger of the then functioning Technical Development Establishment (TDE) of the Indian Army and the Directorate of Technical Development and Production (DTDP) at the Defense Science Organization (DSO). At the time DRDO was a small organization of 10 institutions and laboratories. Growing over the years in many areas in terms of subject area diversity, number of laboratories, achievements and status. Presently DRDO is represented by a network of more than 50 laboratories which are engaged in developing defense technologies covering various fields like aeronautics, armaments, electronics, land combat vehicles, engineering systems, missiles, advanced calculations and modelling, materials, Naval Systems, etc. (Defense Research and Development Organization (DRDO), The official website).

Given the above, we can conclude that the defense-industrial complex of the leading European countries is usually represented by 1 or 2 large companies. However, there are exceptions. For example, in Germany, armaments are manufactured by various companies that are subsidiaries of large industrial groups. One of them is Krauss-Maffei Wegmann (KMW), which introduces the world’s leading technologies for protection of wheeled and tracked vehicles. Armed forces of more than 50 countries rely on the power and dependability of these unique systems. In the regions of Germany, Brazil, Greece, the United Kingdom, Mexico, Singapore and the United States, more than 4,000 employees develop, supply and service a comprehensive range of products. They range from air transport and armoured wheeled vehicles to reconnaissance, anti-aircraft and artillery systems, to battle tanks, armored personnel carriers and bridge systems. It also includes controls and information systems, as well as remote-control crews with reconnaissance and surveillance equipment. Besides, KMW also has far-reaching system competencies in civil and military modeling (Krauss-Maffei Wegmann, The official website).

Exploring the peculiarities of the defense-industrial complex in Ukraine, it should be noted that after the collapse of the USSR, Ukraine inherited a powerful defense-industrial potential, as well as a third of all the Armed Forces. This is confirmed by the fact that in 1991 there was a military group on the territory of Ukraine, which was notable not only for its quantity but also for its quality. Up to 1996, Ukraine owned 130 intercontinental nuclear missiles, and strategic bombers armed with strategic aviation nuclear warheads were based at the airfields. Tactical nuclear weapons accounted for 3,000 units, and 18% of the former USSR’s defense-industrial complex was located in the country (Balueva & Liashenko, 2017).

Presently, the Ministry of Defense of Ukraine, the Ministry for Development of Economy, Trade and Agriculture of Ukraine and the State Concern “Ukroboronprom” act as the responsible authorities in matters of production and transfer (supply, sale) of weapons and military equipment. The Ministry of Defense of Ukraine provides for formation and implementation of the state policy on national security in the military sphere, the field of defense and military construction in time of peace and special period for the military-technical policy.
in the field of defense (Resolution of the Cabinet of Ministers of Ukraine on approval of the Regulation on the Ministry of Defense of Ukraine, 2014).

The Ministry for Development of Economic, Trade and Agriculture of Ukraine is the authorized body for coordinating activities on implementation of the state defense order. In the area of defense and national security of the state the Ministry: (1) prepares and generalizes proposals on formation and implementation of the state policy in the sphere of functioning and development of the defense-industrial complex, development of scientific and technical potential in the field of weapons and military equipment, improvement of the control mechanism of the state in the specified field; (2) identifies, along with other bodies of the security sector and defense sector, the priority directions of the defense-industrial complex development, provides regulatory and legal regulation in the sphere, analyzes the status and tendencies of development of the defense-industrial complex of Ukraine, develops and organizes implementation of development programs for the state defense-industrial complex; (3) ensures coordination of activities undertaken by central and local executive authorities in the field of operation and development of industrial and defense-industrial complex; (4) conducts reviews of the defense-industrial complex in accordance with the procedure established by the law, develops Strategy for development of the defense-industrial complex of Ukraine (Resolution of the Cabinet of Ministers of Ukraine “Issues of the Ministry of Economy, Trade and Agriculture”, 2019).

There are two interdepartmental commissions within the National Security and Defense Council of Ukraine: (1) the Interdepartmental Commission on Defense and Industrial Complex; (2) the Interdepartmental Commission on Policy of Military Technical Cooperation and Export Control.

The State Concern Ukroboronprom, established in 2010 in accordance with the Decree of the Cabinet of Ministers of Ukraine “On formation of the State Concern Ukroboronprom” of December 29, 2010, plays an important role in the defense-industrial complex of Ukraine. The main purpose of creation of Ukroboronprom was to increase efficiency of functioning of state-owned enterprises engaged in economic activity in the field of development, manufacture, supply, repair, modernization and utilization of weapons, military and special equipment and ammunition, and to participate in military-technical cooperation with foreign countries. According to the current legislation, as of October 4, 2018, 125 state-owned enterprises were incorporated into the State Concern “Ukroboronprom” (Resolution of the Cabinet of Ministers of Ukraine On Establishment of the State Concern «Ukroboronprom», 2010).

In addition to state-owned enterprises, Ukroboronprom includes 9 joint stock companies. Since 2013, the enterprises of the State Concern have been grouped into 5 main clusters, namely: (1) aircraft construction and aircraft repair; (2) precision weapons and ammunition; (3) armored, automotive, engineering and special vehicles; (4) shipbuilding and marine engineering; (5) radar, radio and air defense systems.

The legal basis for the activities of the State Concern Ukroboronprom (hereinafter referred to as the Concern) is the statute approved by the resolution of the Cabinet of Ministers of Ukraine “Some Issues on the State Concern Ukroboronprom activity” of August 31, 2011. The main tasks of the concern are defined as follows:

(1) centralized regulation, control and coordination of the activities of the Concern participants, in particular those who, in due course, obtained the right to export, import of military and dual-use products and services, as well as goods containing state secret information;

(2) to promote efficiency of utilization and development of export, production-scientific and technical potential of the Concern participants;

(3) creation and maintenance of the system of sale of high-tech industrial products, generalization of the results of intellectual activity and performance of works and services;

(4) assistance to the Concern participants in conducting applied research in perspective directions of develop-
ment of science and technology and introduction of advanced technologies into production;

(5) encouragement of investments in the defense-industrial complex, in particular for creation of competitive models of high-tech industrial products, including military goods;

(6) creation of export-oriented structures in the defense-industrial complex, development of documents necessary for their creation, as well as development and implementation of marketing strategies in the interests of these structures;

(7) capturing international markets for arms, military and special equipment, conducting marketing research, in particular involving representatives of other enterprises and organizations on a contractual basis;

(8) sale of military property in accordance with the agreements concluded with the Ministry of Defense, other central executive authorities, which administer military formations, enterprises and organizations, including non-residents, sale and purchase agreements, swap contracts, deliveries and other civil legal agreements providing for transfer of property rights for military property on a fee or compensation basis (Resolution of the Cabinet of Ministers of «Some issues related to the activity of the State Concern «Ukroboronprom», 2011).

The Concern is administered by the following organs: (1) the Supervisory Board as the supreme governing organ that ensures protection of the state interests, controls and regulates activities of other administrative organs of the Concern; (2) the board of directors is a collegiate administrative organ comprising general director (chairman of the board of directors), his deputies, as well as representatives of members of the Concern; (3) general director (Ukroboronprom, The official website).

It is necessary to emphasize that today the defense-industrial complex of Ukraine is undergoing reform. The strategy of development of the defense-industrial complex of Ukraine is a long-term document of defense planning, which should be based on analysis of the experience of functioning of the sphere over a long period, since the experience of the Ukrainian defense industry until 2014 is a legacy of the USSR (Otsabryk, 2017).

In 2018, the Strategy for development of the defense-industrial complex of Ukraine for the period up to 2028 was approved by Ordinance of the Cabinet of Ministers of Ukraine of June 20, 2018 (hereinafter the Strategy). The necessity to develop the Strategy is demanded by the urgent need to review by the state institutions of Ukraine of the role of the defense-industrial complex in the context of neutralizing internal and external threats to national security, as well as intensifying the economic growth of the state. The Strategy is the basis for developing new and revising existing regulations (including state dedicated programs) in the field of development and operation of the defense-industrial complex. The Strategy defines the long-term priorities of the state military-industrial policy, as well as the directions of realization of the state dedicated programs of reforming and development of the defense-industrial complex in the medium-term perspective (Ordinance of the Cabinet of Ministers of Ukraine On Approving the Strategy for development of the defense-industrial complex of Ukraine for the period up to 2028, 2018).

The main areas of the Strategy are as follows:

(1) optimization of the public administration system by ensuring the integrity of the enterprise management policy and the state policy for development of the defense-industrial complex;

(2) designation of a central executive body that ensures formation and implementation of the state military-industrial policy;

(3) optimization of the enterprise asset management, targeting specific goals and priorities for each production segment within the scope of managing state-owned objects in the defense-industrial complex, upgrading production facilities, increasing production rates and volumes;
(4) determining the priorities for financing the activities of economic entities, taking into account the objectives of the state dedicated programs of reform and development of the defense-industrial complex and development of weapons and military equipment;

(5) implementation of principles of self-sufficiency and ensuring access to defense projects of a wide range of Ukrainian entities of all forms of ownership;

(6) promoting entrepreneurship and continued sustainable functioning of the private sector;

(7) lifting the ban on setting up joint ventures and carrying out joint activities, attracting foreign capital in the development of production capacities of Ukrainian enterprises, improving the system of public-private partnership;

(8) practical implementation of the model of vertically integrated structures by clusters;

(9) corporatization and introduction of corporate governance model;

(10) creation of independent supervisory boards at the enterprises of the defense-industrial complex in accordance with the principles of the Organization for Economic Cooperation and Development;

(11) introduction of partially competitive procedures during selection of defense contractors by state customers;

(12) liberalization of procedures for obtaining powers by economic entities to perform export-import operations in the defense sphere;

(13) establishment of a structure for implementation of innovative defense projects and development of critical technologies in accordance with the practice of the U.S. Defense Advanced Research Projects Agency;

(14) changes in approaches to organization of management processes at the enterprise level, development of human resources, effective personnel policy and application of the principles of assessment of qualification, professional competence, practical achievements and work experience in the defense and security sector;

(15) training of personnel to meet the needs of the defense industry in specialists of the respective qualifications (Ordinance of the Cabinet of Ministers of Ukraine On Approving the Strategy for development of the defense-industrial complex of Ukraine for the period up to 2028, 2018).

The reform strategy of Ukroboronprom is aimed at integrating the Ukrainian defense-industrial complex into the world high-tech market. The reform aims at close international cooperation within the framework of innovative tendencies and provides for simultaneous work in the legal, technological and industrial fields. An important component of the effective reform is to improve the legal framework and to bring legislation to the world standards. This is confirmed by the fact that 34 bills related to the reform of the Ukrainian defense-industrial complex have been developed and are currently under consideration. (Ukroboronprom, The official website). See table 1.
### Table 1. Reform Strategy of the State Concern Ukroboronprom

<table>
<thead>
<tr>
<th>Key strategic goals</th>
<th>Key strategic initiatives</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reliability</strong></td>
<td><strong>Clustering</strong></td>
</tr>
</tbody>
</table>
| Ensuring defense capability of the country, preventing threats to the security of the state, strengthening the international standing of Ukraine | (1) cooperation with private companies  
(2) optimization of cooperation between manufacturers and researchers  
(3) leading technologies and innovative equipment  
(4) full cycle production |
| **Passionarity**    | **Audit**                |
| Driver of the reform of the defense-industry complex of Ukraine, creation of a favorable legislative environment | (1) an objective view of the Concern by leading international experts  
(2) reasonable assurance and protection of investments  
(3) clear for investors principles of investing  
(4) focus on efficiency of resource utilization  
(5) international management standards  
(6) unique market offer  
(7) roadmap of strategy implementation  
(8) reports in line with the international standards |
| **Innovation**      | **Corporatization**      |
| Development of innovations, involvement of education and science, partnership with global R&D centers | (1) transparent management structures  
(2) supervisory boards  
(3) procedures understood by foreign investors  
(4) clear mechanisms for financing and controlling financial flows |
| **Effectiveness**   | **Main agency for advanced research and development** |
| Maximum productivity, financial consolidation, expansion of markets, development of human capital | (1) creation of high-tech solutions  
(2) effective tool for developers, investors, and the military  
(3) potential for a major breakthrough in the development of the defense industry |
| **Openness and transparency** | **Protection of technologies** |
| Combating corruption, transparent ownership of assets, favorable information policies, openness to international investors | (1) protection of intellectual property in accordance with the international standards  
(2) preserving the intellectual capital of the country  
(3) increase of competitiveness  
(4) stimulation of further innovation activity |

The table was generated using data from the official website of the State Concern «Ukroboronprom» on the reform strategy.

It is also important to note that in the field of defense industry, Ukraine has signed a number of agreements with foreign countries, including the United Arab Emirates, Turkey, Czech Republic, etc.

In particular, in 2015 an Agreement was signed between the Cabinet of Ministers of Ukraine and the Government of the United Arab Emirates on military and technical cooperation, the main purpose of which was development and organization of military-technical cooperation in the field of technology and defense industry, including preparation, development, recognition of quality and creation of directions of cooperation between state and private enterprises, institutions, organizations of the countries. The main areas of the Agreement were: (1) the defense industry; (2) armaments and military equipment; (3) cooperation on environmental issues and pollution caused by military activities; (4) providing educational services and military training in accordance with the needs and capabilities of the Parties; (5) development, production, modernization, repair and provision of other services in the military-technical sphere; (6) technology, technical assistance in setting up production of weapons and military equipment; (7) exchange of information and experience on standardization, certification and quality control of defense-related products for joint projects; (8) protection of intellectual property rights for the results and intellectual property related to development and production of weapons, ammunition and military equipment; (9) other areas of military-technical sphere that may be of common interest (Agreement between the Cabinet of Ministers of Ukraine and the Government of the United Arab Emirates on military and technical cooperation, 2015).
In 2017, the Agreement on Military-Financial Cooperation was signed between the Cabinet of Ministers of Ukraine and the Government of the Republic of Turkey in order to further strengthen military cooperation, long-lasting friendly relations and development of the Armed Forces of Ukraine.

In 2006, the Agreement between the Cabinet of Ministers of Ukraine and the Government of the Czech Republic on cooperation in the field of defense industry, providing cooperation in the field of defense industry in the following areas: (1) research, development, modernization, repair and production in the field of defense industry; (2) sale of defense-related products developed or manufactured under joint projects to third countries by mutual agreement; (3) search for possibilities of implementing joint programs for development, production and modernization of defense-related products and associated technical services in the interests of the Armed Forces of the Parties and, if agreed, of third countries; (4) exchange of scientific and technical information, information on standards used by countries of the Parties in the defense industry, information on quality assurance systems, codified data on products manufactured by countries of the Parties and used by another country of the Parties, and exchange of documents, related to all the above fields; (5) participation in military-industrial fairs, commercial exhibitions and symposia organized on the territories of the Parties; (6) cooperation in other areas of defense industry by mutual agreement of the Parties (Agreement between the Cabinet of Ministers of Ukraine and the Government of the Czech Republic on cooperation in the field of defense industry, 2006).

5. Discussion

In the course of the study it was found that in Ukraine the responsible authorities in production and transfer (supply, sale) of weapons and military equipment are the Ministry of Defense of Ukraine, the Ministry of Economic Development, Trade and Agriculture of Ukraine and the State Concern “Ukroboronprom”. It is important to note that the current Law of Ukraine “On National security of Ukraine” contains rules on the powers of the central executive body, which ensures formation and implementation of the state military-industrial policy (Law of Ukraine On national security of Ukraine, 2018).

Based on the current legislation, the Ministry of Economic Development, Trade and Agriculture of Ukraine is responsible for the functioning and development of the defense-industrial complex. At the same time, the Ministry of Defense of Ukraine is the main user of weapons and military equipment and the coordinator of military and technical policy.

Thus, the issue of control of individual resource branches in the defense industry by various state bodies remains a problem. Improving the efficiency and coherence of the work of this industry, as well as solving the problem of information branching are possible by creating a separate executive body to ensure formation and implementation of the state policy of Ukraine in the field of defense industry.

Conclusions

Given the above, it can be concluded that the defense-industrial complex of the leading European countries is usually represented by 1 or 2 large companies. For example, in France, the major companies that have become world leaders in the system of defense-industrial complex, are Thales and Safran. In Italy, Leonardo is a global high-tech defense and security company. In the UK, BAE Systems is the leading company in the field of national security, protection of critical information and infrastructure. Saab is the leading company in Sweden serving the world market of governments, authorities and corporations with world leading products, services and solutions from military defense to civil security. However, there are exceptions. For example, in Germany, armaments are manufactured by subsidiaries of large industrial groups.

In Ukraine, the Ministry of Defense, the Ministry of Economic Development, Trade and Agriculture of Ukraine and the State Concern «Ukroboronprom» act as responsible authorities for production and transfer of weapons and military equipment.
Presently, Ukraine’s defense-industrial complex is undergoing reform. In 2018, the Strategy for development of the defense-industrial complex of Ukraine for the period up to 2028 was developed. Reforming the State Concern “Ukroboronprom” is no exception and involves integration of the defense-industrial complex of Ukraine into the world market. The reform is aimed at international cooperation within the framework of innovative tendencies and envisages simultaneous work in the legal, technological and industrial fields. An important component of the effective reform is improvement of the legal framework and approximation of legislation to the international standards. This is confirmed by the fact that 34 bills related to the reform of the Ukrainian defense-industrial complex have been developed and are under consideration at the moment.

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Abstract. The article deals with the study of the financial security of the state as a component of its national security. It has been established that financial security is state’s ability to react in an adequate and immediate way to internal and external negative financial influences in peacetime and in emergency situations, in particular in the context of a hybrid war. It has been established that the components of the financial security of the state are banking, debt, budget, currency and monetary security. It has been found out that corruption, financial and economic crime, hybrid war, fiscal decentralization, and lack of a strategy to protect the financial and economic interests of the state are threats to the financial security of the states in the present conditions. At the same time, proper protection of the financial security of the state against internal and external threats is possible only in case of quality management of the financial and economic sphere, first of all, this is the identification of threats to the financial security of the state, conducting financial control, and counteraction and combating against financial and economic crimes, which is the task of law enforcement agencies. The development of the idea of creating a single law enforcement agency of Ukraine empowered to prevent, detect, suspend and investigate financial and economic crimes was considered. For comparison, attention was drawn to foreign experience, namely Italy, Romania, Macedonia, Austria, Croatia, Latvia, Lithuania, for which the activity of such law enforcement agencies is already established practice. The positive aspects which can be implemented in Ukraine as well as in other countries, intending to create a new law enforcement entity, were emphasized.

Keywords: financial system; financial security; national security; corruption; organized crime; financial police


JEL Classifications: F35, F42

1. Introduction

Historically, the main threat to the national security of the state was the armed conflict, which has always been provoked by the states themselves. Therefore, the concept of «security» is often understood as control of military threats. However, the situation changed in the 21st century. Threats ceased to be limited to only military threats. The financial crisis, terrorism, proliferation of nuclear, chemical weapons, ethnic conflicts, organized crime, epidemics, overpopulation, climate change and so on began to affect the status of national security. All countries in the world are upon pain of every day, therefore there is a growing awareness that it can only be saved through the cooperation of states, international organizations, communities, etc.

The financial crisis and a number of other threats directly determined the need for states to pay attention to the protection of their financial interests, then the issue of financial security has become particularly relevant at both national and international levels. In particular, appropriate financial security strategies are being implemented, law enforcement agencies are being reformed, and new law enforcement agencies are being set
up to minimize negative trends in the financial sector in Ukraine. For example, in 2017, the analysis of the financial security of Ukraine demonstrates that there is an excessively large share of cash outside banks in the total amount of money supply – at the level of 26-27%, there is discrepancy between the balance of incomes and expenditures of the state and local budgets and inefficient use of public funds. Accordingly, the budgetary security of Ukraine is not even in a threatening status, but in a pre-crisis status. Not surprisingly, in accordance with international standards assessing the financial security of the state on indicators A, B, C and D, Ukraine has a rating of C (Józef Antoni Haber, et. al., 2018).

2. Literature Survey

Given the relevance of the issue of financial security of the state in modern conditions at the doctrinal level, a number of scientific papers is devoted to it. First of all, the scientists’ opinions regarding the definition of the concept of «financial security of the state» are differed, while all scholars support the idea that the financial security of the state as an element of the economic security of the state is the core of the national security of the country on the whole (Durmanov et. al., 2019).

Thus, Britchenko, N.I. Bohomolova, O.O. Kravchenko, S.S. Pinchuk define the financial security of the economic system as achieving of such level of financial stability which will foster to the maintain of financial equilibrium and ensure targeted growth in accordance with the development strategy (Britchenko et.al., 2018).

According to Varnalii Z. and Tomashevskyi T., financial security of the state is one of the key positions of economic security when the status of public finances is directly related to the status of the national economy, while the economic well-being of the country depends largely on the level of financial security afforded to each individual, society and the nation on the whole. At the macro-level, financial security is ability of the state to react adequately to internal and external negative financial influences in peacetime and in emergencies, in particular in a hybrid war (Varnalii & Tomashevskyi, 2019).

Kurylo M., Klochko A., Zhuravlov D., Javado, H. determine the constituent elements of the financial security of the state without considering the essence of this concept. Thus, scientists refer banking, debt, budget, currency and monetary security to the content of the financial security of the state (Kurylo et. al., 2018).

According to Galina Pochenchuk, financial security is driven by the ability of public authorities to ensure the sustainability of national financial and economic development and the payment and settlement system, compliance with the main financial and economic parameters of the national economy, optimal allocation and rational use of budget resources, as well as ability to make external borrowing optimal for the national economy and to use them effectively, to neutralize the impact of financial crises and targeted actions of international and national economic agents on the economic, social and political system of the state, to prevent the outflow of capital abroad, crimes and administrative offenses in the financial sector (Pochenchuk, 2014). Obviously, the definition proposed by the scientist is broader and allows to characterize the financial security components of the state. Thus, the status of national financial security is directly dependent on the effectiveness of its management and counteracting the internal and external threats (Siddikova & Starodumova, 2019).

It should be agreed with Z. Varnalii and T. Tomashevskyi that the level of threats to financial security is not a constant magnitude - it changes with the overall economic situation. The process of globalization associated with the fall in the level of state regulation and restrictions caused by the interests of certain national and economic structures plays a special role in the activation of the sphere of finances. Threats to financial security destabilize the economic situation in the country and impede the normal development of the community, also cause considerable harm to them (Varnalii & Tomashevskyi, 2019).

Today, as Nataliia Zachosova and Nataliia Babina point out, non-traditional types of threats are becoming especially widespread. They are not traditional for financial institutions and have a significant impact on the
results of their operation and they are called as «hybrid threats». Thus, the functioning of the financial market and its participants is currently under the control of the hybrid war caused by the conflict situation in the east of Ukraine. Accordingly, financial institutions can act as entities of hybrid warfare in the economic sphere and their products and services should be tools of war (Zachosova & Babina, 2018; Ključnikov, Mura, Sklenár, 2019).

Corruption also plays an important role in internal threats to the financial security of the state. Therefore, we should agree with B. S. Malyniak, O. M. Martyniuk, O. P. Kyrilenko that the impact of corruption on public spending is changed depending on the level of democracy in the country. In the countries with low levels of democracy, reducing of the corruption level increases effectiveness of government spending on 0.923 units, while the similarly decreasing of corruption in the countries with the high-level of democracy will increase government spending on only 0.701 units (Malyniak, et. al., 2019).

The process of fiscal decentralization has begun, it is underway or has already completed in many countries, which fosters to transform the territorial communities and local governments into full members of the financial interconnection system. Under this reform, territorial communities receive individual financial interest. Therefore, there is also need to protect them, as these interests are the basis for creating a safe environment for the functioning of territorial communities (Bak, 2019; Korauš, et.al., 2019).

On the contrary, Siemiątkowski P. emphasizes that developing countries must pay attention to external financial dangers. Such states are more vulnerable to the effects of potential global crises and to possible activity by international speculators. In turn the states which are members of the European Union for a long time are highly developed economies that can already boast by high authority in the eyes of international investors. Even low macroeconomic indicators do not force investors to leave the market. These economies have no difficulty in acquiring external financing (even in spite of the large proportions of external debt). Although the exception is the United Kingdom, which is the second country after the United States suffered from the most economic losses after the last financial crisis. This example is rather the exception of the rule (Siemiątkowski, 2017).

Some scholars, in particular Oleksandr Sharov, considering the issue of financial security also reveals the place of the International Monetary Fund, which was created as one of the most important institutional elements of the international economic security in the mechanism of protecting the financial interests of the state. However, if there are scientists who believe that the lack of interaction of states with the International Monetary Fund impedes investment attraction in the economy of the state, Oleksandr Sharov refutes this view, noting that the lack of programs of cooperation with the International Monetary Fund is not a threat to the national economic security, since insecurity of financial and economic interests of the state at the national and international levels are likely due to the lack of real reforms and measures to improve the financial and economic situation within the country (Sharov, 2017).

However, a significant danger is financial and economic crimes for both national and international financial and economic interests of states. In the context of globalization and development of information and computer technologies, international institutions have officially recognized the 21st century as the century of fraud. The economic crime investigations conducted annually by the international auditing firm PricewaterhouseCoopers, allowed to generalize the most common threats to economic security and their corresponding challenges in Ukraine and in the world. According to the survey, the most typical and traditional types of economic crime are: (1) misappropriation of assets; (2) bribery and corruption; (3) procurement and accounting fraud, etc. According to official data, the level of economic fraud in the world in 2016 reached the level of economic crimes in Ukraine as of 2011, and this is a common threat for all companies at the national and world markets without exception (Moskalenko, 2016). A significant threat for today is also this type of financial and economic offenses as the legalization (laundering) of criminal proceeds (Leonov, et. al., 2019).
3. Methods

Both general and specific methods of scientific cognition are used for the study of the issue of financial security of the state.

In particular, the dialectical method of cognition is used to evaluate the theoretical and normative principles of understanding financial security in the structure of national and economic security. In turn, causal analysis methods are the basis for a direct analysis of the functioning of financial security in the current conditions of the Ukraine’s development, while comparative methods of the analysis are used to study the similarities and differences between different elements of the state national security structure. The structural and functional method allows to reveal the specifics of the subject composition of financial security protection in Ukraine and other European Union countries.

4. Results

Speaking about the protection of the financial and economic interests of the state, scientists primarily focus on the subjects authorized to carry out such activities. The most important step in this direction should be to determine the list of threats affecting financial market participants and can destabilize their activities and slow down the development of the financial system of the country on the whole.

Pikhotskyi V. F., Rysin V. V., Lyubenko A. M. note that one of the tasks of the state in the direction of protecting the financial and economic security of the state is to control the use of financial and material resources. Financial control is important in the public sector, as a clear assurance of standards in the budgetary sector contributes to the social stability, economic security and a high level of social security. Society’s belief in power also largely depends on the effectiveness of financial control. Ukraine has not yet implemented a single methodological basis for building an effective audit system in the public financial management sector, so the need for new theoretical and practical approaches to the development of public finance auditing is urgent. Ideally, according to scientists, the state should have a financial audit, effectiveness audit and operational audit. Accordingly, financial audit is carried out by economic entities, budgetary institutions and state and communal property entities; effectiveness audit is focused on assessing the implementation of local budgets and development programs; operational audit is aimed at checking individual business operations (Pikhotskyi, et al., 2019).

Continuing the topic of the importance of governance in the area of financial security of the state, we should also agree with Rushchyshyn N., Buchko I., Kostak Z., who propose to optimize the management of the public debt of the state by giving the Debt Management Committee the powers in this area to promote the efficient use of external borrowing which will help to restore and develop «problem areas» of the economy and increase the state budget revenues (Rushchyshyn, et. al., 2016).

However, increase of the level of financial security of the governance itself is not enough, it is also necessary to carry out activities for the prevention, detection, termination and investigation of financial and economic crimes, which, as already mentioned, pose a significant threat to the financial security of the state. Today this task is entrusted to the relevant law enforcement agencies in all states. The process of creating a responsible law enforcement agency is still ongoing in Ukraine, as evidenced by the latest draft law “On the Bureau of Financial Investigation”. Although there have been several such bills since 2013, the legislator still cannot determine the model of the future law enforcement structure (Table 1).
Table 1. Status of the law enforcement agency responsible for counteracting and combating financial and economic crimes under the draft laws in Ukraine

<table>
<thead>
<tr>
<th>Name of the bill</th>
<th>Status of the body according to the bill</th>
</tr>
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<tbody>
<tr>
<td>On the financial police (2016)</td>
<td>It is a state law enforcement agency, whose activities are directed and coordinated by the government through the Ministers of Finance, entrusted with the duty to ensure the prevention, detection, termination, investigation and detection of crimes in the sphere of formation and use of financial resources of the state, economic security related to its jurisdiction, respectively, to the Criminal Procedure Code of Ukraine.</td>
</tr>
<tr>
<td>On the Financial Investigation Service of Ukraine (2017)</td>
<td>It is created on the basis of tax police and a unit on combating against money laundering and it is the central law enforcement agency with special status. It is composed of units for combating criminal offenses in the field of economic activity, investigative units and units for combating corruption and their own security.</td>
</tr>
<tr>
<td>On the National Financial Security Bureau (2018)</td>
<td>It is a state law enforcement body, which is subordinated to the Verkhovna Rada of Ukraine, the President of Ukraine, and ensures elimination of threats to the financial security of the state on the basis of criminal analysis, risk analysis. It is carried out by preventing, detecting, suspending, investigating and solving crimes related to its subsidiarity, which directly or indirectly damage public finances and prevent them from being committed in the future.</td>
</tr>
<tr>
<td>On the Bureau of Financial Investigation (2019)</td>
<td>It is a central executive body implementing the state policy on the prevention, detection, termination, investigation and disclosure of criminal offenses in the field of economic activity that directly or indirectly harm the public interest in the field of finance</td>
</tr>
</tbody>
</table>

In general, the idea of creating a law enforcement agency countering and combating financial and economic crimes in the country is supported by scientists, experts and the public. But the question remains of defining a unified concept for the creation and operation of such body, since a number of bills is testified the opposite. In order to better understand the direction of Ukraine in the area of protection of the financial and economic interests of the country, it is necessary to pay attention also to foreign experience, its expediency to study is also confirmed by the provisions of the Recommendations of the Working Group “Prospects for Cooperation of Ukraine and the European Union in the Area of Justice, Freedom and Security”, 2012, which require a review of the powers and number of law enforcement agencies that counteract crime in the Ukrainian economy (staff reduction, eliminating certain structures).

In general, the experience of foreign countries demonstrates that the functioning of a single law enforcement agency entrusted combating with financial and economic crime is not new and such entities have been operating effectively in most states for a long time (Table 2).

Table 2. Subjects empowered to combat and counter the financial and economic crimes in European countries

<table>
<thead>
<tr>
<th>State</th>
<th>Authorized entity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Italy</td>
<td>Financial Guard (Ministry of Economy and Finance)</td>
</tr>
<tr>
<td>Romania</td>
<td>Financial Guard (Ministry of Economy and Finance)</td>
</tr>
<tr>
<td>Macedonia</td>
<td>Financial Crime Investigation Bureau (Ministry of Finance)</td>
</tr>
<tr>
<td>Austria</td>
<td>Financial Police (Ministry of Internal Affairs)</td>
</tr>
<tr>
<td>Croatia</td>
<td>Financial Police (Ministry of Finance)</td>
</tr>
<tr>
<td>Latvia</td>
<td>State Revenue Service (Ministry of Finance)</td>
</tr>
<tr>
<td>Lithuania</td>
<td>Financial Crimes Investigation Service (Ministry of Internal Affairs)</td>
</tr>
</tbody>
</table>

Thus, among the countries of the European Union, one of the most effective law enforcement agencies in protecting the financial and economic interests of the state operates in Italy. The organizational and functional model of the Financial Guard of Italy indicates that it occupies an important place in the system of executive authorities and the Italian law enforcement system. To date, the tasks of the Financial Guard of Italy, which is directly subordinated to the Ministry of Economy and Finance and it is an integral part of the armed forces of the state, include:

(a) tax control;

(b) supervision of excise duties;
(c) customs control, control of public expenditure;

(d) counteracting organized crime;

(e) combating against counterfeiting;

(f) fraud prevention and counteraction within the European Union system;

(g) oversight of lawfulness in public procurement, tendering;

(h) organizing interaction with other law enforcement and regulatory authorities in the country (Adeguamento dei compiti del Corpo della Guardia di finanza, 2001).

In Romania, control over compliance with tax laws, prevention, detection and investigation of tax evasion and tax fraud is entrusted on the Finance Guard of Romania, which is subordinated to the Ministry of Economy and Finance. Accordingly, the Financial Guard of Romania conducts the financial control and checks on compliance with regulations to prevent, detect and terminate actions prohibited by law, trade rules to prevent, detect and eliminate illegal trading operations, order of manufacture, storage, movement and sale on the territory of the state. The objectives of financial control carried out by the Financial Guard are:

(1) compliance with financial and economic discipline and budgetary requirements in terms of income and expenditure;

(2) compliance with the lawfulness of the management of financial and material funds in national joint-stock companies where the state is a shareholder, directly or indirectly through an institution or body of state power;

(3) compliance with the targeted use of the state aid;

(4) compliance with the obligation to pay taxes and fees to the State (Financial Police Office).

The Financial Crime Investigation Bureau in Macedonia is the subject of protection of the financial and economic interests of the state against unlawful encroachments, it is also subordinated to the Ministry of Finance. Today Macedonia’s Financial Crime Investigation Bureau:

(a) provides financial control, control over the application of tax, customs and other financial rules;

(b) identifies and documents criminal cases, foremost in the area of combating with organized crime;

(c) carries out preliminary investigative steps;

(d) initiates and conducts misdemeanor proceedings in misconduct cases, and initiate misdemeanor proceedings in misconduct cases if the fact of a of financial law violation in the exercise of their powers is discovered.

(e) prepares and provides expert opinions and recommendations within its competence at the request of other public authorities and institutions (Regulamentul de organizare şi funcţionare a Gârzii Financiare, 2010). It should be noted that the bodies counteracting the financial and economic crime of Romania and Macedonia have fewer powers than the Italian Financial Guard.

Similar bodies also operate in Austria, Croatia, Lithuania, Latvia, etc. Yes, the Austrian Financial Police is a special unit of the Austrian police to combat tax fraud related to tax evasion and social security deductions. In order to identify tax evasion, social deductions, shadow economy, the Austrian Financial Police is entitled to carry out targeted audits (Finanzpolizei). The Financial police also operate in Croatia, but structurally it is a part
of the Ministry of Finance system and it is headed by its director, who is appointed to the post by the country’s
government on the proposal of the Minister of Finance. According to the Law of Chortia “On Financial Police of Croatia” No. 177/04, this body is responsible for control over:

(1) the use of budgetary funds;

(2) following the order of reflection and accounting in the accounting documents of the goods and services sale, income, profit;

(3) registration of taxable movable and immovable property in the tax authorities;

(4) accuracy of the declared data giving the right to reduce or exempt tax liabilities (Zakon o financijskoj policiji).

The State Revenue Service has been operating in the Republic of Latvia since 1993, it is a public administration institution subordinated to the Minister of Finance. An important place in the structure of this service belongs to the Financial Police Department, whose main tasks are:

(a) conducting operational activities to detect and prevent crimes in the field of public revenue;

(b) investigation of offenses in the field of public revenue (Law of the Republic of Latvia on the State Revenue Service, 1995).

The body specialized in the combating against financial crimes is under the jurisdiction of the Ministry of Internal Affairs in Lithuania. In particular, the Financial Crimes Investigation Service is a special law enforcement agency whose purpose is to identify and investigate crimes and other related offenses that harm the financial system of the state. The Financial Crimes Investigation Service executes the following tasks:

(1) identifying and investigating fraudulent or negligent taxpayer accounts, misrepresentation of tax information, state (municipal) fees, tax evasion, contributions to state social security, and other payments, report failure approved in due course;

(2) detecting and investigating actions related to the legalization of money or property obtained from criminal activity, illicit circulation of securities, and other fraudulent activities related to the financial system except the facts of counterfeiting;

(3) identification and investigation of crimes and other offenses related to the receipt and use of financial assistance from the European Union and foreign countries;

(4) cooperation with law enforcement agencies and other institutions of Lithuania and foreign countries, international organizations on the issues within the competence of the indicated service;

(5) taking measures to prevent tax evasion, state (municipal) fees and other payments, misappropriation and funds waste of state and municipal property, financial assistance from the European Union and foreign countries;

(6) collection and analysis, summarization and information on the illicit receipt and use of financial assistance from the European Union and foreign countries;

(7) preparing proposals for the improvement of regulations governing the investigation of crimes and other offenses against the financial system (Law of the Republic of Lithuania on the Financial Crime Investigation Service).
5. Discussion

Considering the importance of protecting the financial and economic interests of the state, the establishment and operation of a law enforcement agency responsible for preventing, detecting, suspending and investigating financial and economic crimes is one of those pressing issues. On the plus side, Ukraine respects the recommendations of international institutions and the best practices of foreign countries and is moving towards the creation of a specified law enforcement structure. On the negative side, various draft laws have been registered in the Verkhovna Rada of Ukraine since 2013, which suggested defining the legal basis for the creation and operation of a law enforcement agency in the area of counteracting and combating financial and economic crime. However, none of them was accepted.

Without going into details of the draft laws, it should be noted that there are two issues to be debated. The essence of the first question is that most scientists see only the formality of establishing a single law enforcement agency to prevent, detect, suspend and investigate financial and economic crimes at the tax police units of the State Fiscal Service of Ukraine. And the second question is related to the warning of scientists that the new law enforcement structure will receive powers to counteract and combat financial and economic crime from existing law enforcement agencies as subjects of financial and economic security of Ukraine, whose implementation will be difficult to control, which can lead to abuse their powers by the authority.

However, such processes can be avoided by providing the implementation of integrated control over a single law enforcement agency in the field of counteracting and combating with financial and economic crimes in the country in the current legislation.

Conclusions

Thus, the financial security of the state is a core not only of the economic but also the national security of the state, considering that the issue of its security should be paid significant attention at the national and international levels, which is relevant in the context of globalization and a number of other factors negatively affecting the financial and economic situation in the state and the world.

Scientists understand the financial security of the state as protection of the financial and economic interests of the state against internal and external unlawful threats. Corruption, financial and economic crime, fiscal decentralization, hybrid war, lack of a strategy to protect the financial and economic interests of the state belongs to the threats of the financial security of the state. Of course, this list is not exhaustive, because, new challenges are emerging every day for countries in the financial and economic sphere in the context of globalization and the constant development of computer technologies.

An important role belongs to the quality management of the financial and economic sphere in the direction of improving the status of the protection of the state’s financial and economic security, but nonetheless an important role belongs to activities in the field of countering and combating financial and economic crimes, including misappropriation of assets, corruption, fraud in public procurement, tax evasion, other statutory fees. Such a task is entrusted to law enforcement agencies, it is usually one law enforcement agency in each state. In view of this, Ukraine also seeks to delegate all powers of preventing, detecting, terminating, investigating of financial and economic crimes to a single entity, but the sole concept of creating and operating the indicated body has not yet been reflected in the relevant law.

Experience of foreign countries demonstrates that Ukraine is on the right track, since there are similar entities in the countries of the European Union: Italy – Financial Guard, Romania – Financial Guard, Macedonia – Financial Crime Investigation Bureau, Austria – Financial Police, Croatia – Financial Police, Latvia – State Revenue Service, Lithuania – Financial Crimes Investigation Service. These are not all examples of states that confirm the feasibility of establishing a law enforcement agency in Ukraine in the field of counteracting and combating financial and economic crimes. This is evidenced by a number of other benefits:
the existence of one entity responsible for the prevention, detection, termination and investigation of financial and economic crimes; (2) possibility of establishing better cooperation of the new law enforcement agency with the relevant structures of foreign countries; (3) simplification of the mechanism of control over activity of the specified law enforcement structure.

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Impact of Currency Regime on Business Companies: Perception of Georgia’s Businessmen

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Abstract. Clearly money is very important for any community of humans, especially for business purposes. It is well known that in modern world currencies of all developed countries have their own problems but problems of coping with own currency is much bigger in developing countries. Steve Hanke offers fixed exchange rate as a solution for developing countries. There can be some other ways too: not to have national currency, to have free currency regime, etc. Here is given a research about the currency problems of Georgian businessmen and of their opinions about how one could better cope with the currency’s problems.

Keywords: business development; stability; value of money; durability of money; devaluation


JEL Classification: E000, E310, F310, G380, M210

1. Introduction

Money is one of the main tools in the economy. There is a lot of attention to various facets of money functioning, to be it innovative forms of money, money laundering, factors affecting value of local currencies etc. (e.g. Šimonová et al, 2019; Kordík, Kurilovská, 2017; financing, Baltgailis, J. 2019; Humbatova et al., 2019; Limba et al., 2019). Monetary policies allow to tackle such issues as unemployment, poverty, to impact economic growth patterns. Monetary policy directly affects conditions of entrepreneurship.

The presented paper aims to reveal reaction of Georgia’s business companies to diminishing value of national currency and their opinions about country’s monetary policy alternatives, which will be faced in the near future.

Context of the research.

Looking at the history of money it seems that the best period was the one with golden standard, not ideal but better than we have now. All the time there were some supporters of golden standard but as Josef Salerno writes: “As recently as the early 1970s, the prospect of a governmental body seriously deliberating the merits of re-instituting the gold standard would have been considered unthinkable. In the years following World War II, the overwhelming majority of economists and economic policymakers as well as the population at large came increasingly to consider gold as a relic of a barbarous and bygone age, unfit to perform the functions of money in a modern industrial economy. The tiny handful of gold standard advocates, both inside and outside the economics profession, were then regarded as hopelessly benighted economic Neanderthals or thralls to a peculiar fetish” (Salerno, 2010, p. 324).
It is clear that money which is manipulated by someone (government) is not sound, it cannot be sound when its value depends on political expediency. During centuries people understanding this problem tried to find its solution. Salerno writes: "The idea of sound money was present from the very beginning of modern monetary theory in the works of the sixteenth-century Spanish Scholastics who argued against debasement of the coinage by the king on ethical and economic grounds. The concept of sound money, or “sound currency” as it was then called, was central to the writings of David Ricardo and his fellow “bullionists” in the early nineteenth century who argued that the price inflation observed in Great Britain during and after the Napoleonic Wars was caused by the suspension of the convertibility of bank notes into gold and silver mandated by the British government. The ideal of the bullionists was “a self-regulating currency” whose quantity, value and distribution among nations were governed exclusively by market forces of supply and demand” (Salerno, 2010, p. xi).

It is clear that the stability of money is very important for economic subjects, for making any contract it is very important that 100 dollars today is equal to tomorrow’s 100 dollars. Without this stability there appear problems with making long term agreements and this delays economy. John Maynard Keynes did understand this mentioning that inflation is method of taxation. However not business subjects and their activity were important for him but the government: “A Government can live for a long time, even the German Government or the Russian Government, by printing paper money. That is to say, it can by this means secure the command over real resources, - resources just as real as those obtained by taxation. The method is condemned, but its efficacy, up to a point, must be admitted. A Government can live by this means when it can live by no other. It is the form of taxation which the public hind hardest to evade and even the weakest Government can enforce, when it can enforce nothing else” (Keynes, 1924, p. 41). But the question is if this is better either for the business subjects, or for the business activities, or for the economy. What is better for the nation, wealthy government or more activity of business subjects?

Many authors wrote about this problem in USA showing the problem of US Dollar with Federal Reserve System (FRS) and trying to find way out from this blind alley. For example, Milton Friedman says that the FRS turned to a stubborn institution… (Friedmen, 2002, p. 44) and he thinks that the range of FRS should be limited to print money (make emission) by range 3-5% (Friedmen, 2002, p. 54). Because of his understanding the problem with FRS he emphasized impropriety of supporters’ mind. For example, after every crisis the supporters claimed that this crisis could be much worse if not the attempts of FRS. Friedman writes that all these arguments are wrong. The fact is that depression and partially also other periods of unemploiments are the results of wrong steps of government and not result of non-stability of private sector of the economy. The responsibility was given to the agency – Federal Reserve System which was established by government. And this agency in years 1930 and 1931 attained that the problem which in other case could be small recession of economics became to a huge catastrophe. (Friedmen, 2002, p. 39).

While arguments by gold standard proponents are increasingly serious in light of the current problems, there seems to be no sign that the dispute will reach a consensus in the near future. Even Alan Greenspan himself (who later served as chairman of the US Federal Reserve System for all 19 years, from 1987-2006) states: “This is the secret of the welfare state against the faded secret of gold. Deficit spending is a simple scheme of ‘hidden’ wealth seizure. On the way to this insidious process lies gold as a proponent of property rights. If each of us embraces this insidious plan, it will not be difficult to imagine the aggression of those who advocate state intervention against the gold standard”. (Greenspan, 2010, p. 147). He compares the system before the First World War (before the Federal Reserve System which was established in 1913 there was the gold standard regime) and the current one with a clear indication of how much worse the new system to overcome the crisis: “a completely free banking system and the gold standard of the system so far has not been achieved. But before World War I, the banking system in the United States (and many countries around the world) was based on gold, and although governments sometimes intervened, banks were more free than controlled. Periodically, as loans expanded rapidly, banks lent below their gold reserves limit, new loans ceased to generate sharp increases in yields, and the economy was in a sharp but short recession (compared to the Depression of the 1920s and 1932, production declines were moderate until World War I). It was limited by the availability of gold reserves, which
prevented an unbalanced expansion of production activity. The transition periods were short and the economy was quickly restoring a reliable base for expansion.” (Greenspan, 2010, p. 145).

Shortly, the government spending is giving illusion that it can hurry up an economic growth. Hayek says: “The origins of contemporary monetary problems related to Keynes and his disciples, who have given scientific power to centuries old prejudice about that spending money gives long-term prosperity and achieving full employment”. (Hayek, 2016).

The current situation is that each economic entity has to constantly take into account the inflation factor, but this was not so during the history of humanity, as “for centuries tobacco, wheat, non-ferrous metals, sheep, etc., played a role of money in various societies. However, gold and silver have been the most well-loaded functions of money. Most states speaking in different languages recognized the advantage of using gold money, compared to other commodities that made gold (and partly silver) a world currency many centuries ago. The public has never had a need for modern monetary policy, as inflation in the money market has never bothered the public despite the fact that the banking system was free from any central bank pressure and restrictions. Inflation is the result of excess of money, and the bank itself is a source of additional money” (Tsomaia, 2010, p. 218).

There are much more radical views from some other scientists. For example, Hans-Hermann Hoppe thinks that the emission of printed money means to put fiat money in the turnover and only the ones get profit from this emission who get the new printed money at first (Hoppe, 2010, p. 173).

While the problem exists for developed countries like USA and others, the same problem is much bigger for the developing ones. Different countries have different currency regimes and mostly the problems occur because of these regimes. National bank of each country tries to argue that the current system for their country is most appropriate and it should be as it is. In Georgia there is free floating regime and Georgian national bank argues that this is the best one for Georgia. Tamar Baiashvili analyses some circumstances and concludes that: “current floating regime for Georgian economy is optimal” (Baiashvili, 2018, p. 59).

Opposite to the national bank’s position there are scientists who think that it would be much better if developing countries used foreign stable currencies as theirs or at least to fix national currencies’ exchange rates to one of them or to their combination. Steve Hanke even wrote a special book for Georgia to help to change Georgian national bank to the currency board of Georgia. In this book he wrote: “dollarization is much more transparent, trustable and profitable for the economy…” (Hanke Steve, 2010, p. 39).

Another issue needs to be emphasized. It is widely believed that reducing the value of a currency against foreign currencies is good for the economy as it promotes export. In fact: “The encouragement of export by depreciating means of payment directly means giving a benefit to the population of the importing country at the expense of own population (the same economic entities N.Ch.) - the local population is already buying less through their depreciated means of payment, and foreigners have a more chance to buy imported goods in better price at the expense of the population of the exporting country” (Jandieri, 2010, p. 209).

On April 13-14, 2017, the Asian Development Bank (ADBI) Institute in Tokyo, Japan, hosted a two-day seminar on the 20th anniversary of the Asian Financial Crisis: Lessons, Challenges, and the Way Forward. At this two-day busy seminar which was broadcasted live, many interesting insights were expressed about the crisis twenty years ago, about the post-crisis period, including the year 2008 crisis, and the currency problems (so-called currency mismatch), which was one of the perpetrators in forming bubbles, and this is followed by a steady rise and the rupture of the crisis. Hyung Sung Shin, a representative of the Asian Development Bank, identified three main challenges:

- Global dollar funding and financial channel of exchange rates;
- Local currency bond markets and monetary policy challenges;
- Local currency bond markets and financial stability challenges.
The strengthening of the local currency is associated with problems in terms of financial conditions, so it is a question of which system is better, an efficient regime or a bilateral US dollar? What mechanism plays the major role, additional risks, or agreed courses? How to determine the agreed value? He concludes that the global dollar is important to Asia as a major backdrop; in terms of monetary policy, the dollar exchange rate is a crucial financial condition and the local currency situation depends on the dollar exchange rate; in terms of financial stability, the local bonds’ procyclicality is backed by cash. (ASDI, 2017, p. 28:03).

Understanding the existence of this problem Georgian National Bank tries to give some advices how to cope with it. For example, it offers to make hedging. “Various hedging instruments are used to minimize foreign exchange (FX) risk. The main purpose of FX hedging is to avoid the uncertainty associated with exchange rate fluctuations.

FX hedging enables importers and exporters to:
● Project cash flows in different currencies;
● Determine the prices that were foreseen in business plans;
● Maintain operational stability.” (Georgian National Bank, 2018).

Besides the scientists’ and researchers’ opinions it should be interesting to know what the economic subjects think about this issue, especially businessmen who continually make contracts with their partners and customers.

It is clear that changing of the money’s value (non-stability of money) is one of the biggest problems for business subjects in developing countries. With the purpose of studying the businessmen’s opinions about the problems of business, with focus on local currency, in Georgia there was done research in the period of January – April of 2019. Some interesting results of this research are given below.

2. Hypothesis

Fixed exchange rate relative to US dollar (or to Euro) is better for the economic subjects in Georgia.

3. Methodology

For this research the platform SurveyMonkey for sending emails was used. The research used structural questionnaire with 21 questions. Four out of 21 were questions for classification of having information about companies (are they local or international, in which sector of business, how big is size of the company, how long it operates, etc.)

It was very important that respondent had all needed information, therefore the questionnaire was sent to CEO members only (see the Figure 1).

The base of national statistic’s service companies was used for the list of respondents. There were chosen 5000 companies to whom emails were sent and answers were received from 8.5% of them.

The limitation of the study is due to the fact that the percentage of respondents was relatively low. It can be assumed that the e-questionnaire was filled out mainly by the respondents for whom the topic in the questionnaire was relevant and who wanted to express an opinion on the issue.
The respondents were from companies differing by their sizes, time of existence and business specifics.

Distribution of companies by their size is provided in Figure 2, and distribution of companies by their operating time is provided respectively in Figure 3.
The companies were from different sectors of the economy. Here is a chart for companies by their business segments, Figure 4.

**Statistical processing**

During this research the following methods of descriptive and inferential statistics were used: Frequency analysis, traction tables (contingency coefficient) comparison between independent groups by T-test.

The report provides statistically reliable results. For example, if the difference between the two groups of respondents is statistically reliable, it means that the difference between them is not due to random factors. In this case, the T-test or the coefficient of traction coefficient should be $<0.05$. 
The weighted-average method was used to prioritize the list of problems. For simplicity, the table below lists 5 problems that were prioritized by 300 respondents. We matched the priority signs to the weights. For example, if the respondent raised some problem in the first place, he / she is assigned a weight of 5, if in the second place - weight of 4, etc. Frequency of each priority was multiplied by weights and averaged. See Sample in table 1.

**Table 1. Example of calculating the weighted average**

<table>
<thead>
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<td>6</td>
<td>Problem1</td>
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<td>100</td>
<td>30</td>
<td>8</td>
<td>12</td>
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<td>4.23 =SUMPRODUCT($B$3:$F$3;B6:F6)/G6</td>
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<td>7</td>
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<td>120</td>
<td>80</td>
<td>20</td>
<td>10</td>
<td>70</td>
<td>300</td>
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<td>8</td>
<td>Problem3</td>
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<td>300</td>
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<td>9</td>
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<td>15</td>
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<td>25</td>
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<td>120</td>
<td>300</td>
<td>1.97</td>
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<tr>
<td>10</td>
<td>Problem5</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>120</td>
<td>120</td>
<td>300</td>
<td>1.93</td>
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</table>

Source: author

4. Main findings of the study

First question is how many companies operate with foreign currencies. The research shows that in Georgia most companies parallelly to Georgian Lari (GEL) operate with foreign currencies, and among latters majority use for their transactions US dollar, specifically. The chart is given in Figure 5.

**Figure 5. Which foreign currencies are used by companies in Georgia?**

Source: author
On the question does your business depend on the currency exchange rate, only 3.7% answers that it does not depend on exchange rate of national currency. Here is given separately companies which use foreign currency and companies which do not use foreign currencies. The chart is in Figure 6.

![Figure 6. Business' dependence on currency's exchange rate.](image)

Source: author

It is clear that the companies not using foreign currencies depend less on the exchange rate but in any case, we still have dependence for them and quite high – only 8.0% does not depend on the exchange rate.

Majority of the respondents think that the impact of non-stability of money is negative. Only 4.7% thinks that this devaluation has positive effect on their business (see the Figure 7).

![Figure 7. Impact of currency's devaluation on business in Georgia.](image)

Source: author

Even for the companies who do not use foreign currencies the impact is negative, more than 90%. Despite of this fact on the question if their companies have any strategy to insure safety against currency devaluation most of them say that there is no such insuring (Figure 8).
What do the companies do to secure themselves from this problem?

The answers of the respondents whose companies use foreign currency:
Increase their product’s/service’s price; 51.5%
Decrease quantity of employees; 13.6%
Seeking for raw materials in local market; 10.6%
Looking for market abroad; 6.8%
Only 4% of the respondents answered that they do hedging.

Combined chart is given in Figure 9.

Figure 9. Companies’ activity for defending themselves against devaluation of national currency.

Source: author
Beside the offered answers respondents gave some other options:
Reduce salaries;
Do more aggressive marketing;
Make contracts in foreign currencies;
Balancing actives and liabilities;
Reducing time for deferred payment;
Trade on online platforms;
Work with exchange rate given by national bank of Georgia;
Take credits in national currency;
Some respondents said that if the devaluation of national currency continues their company will stop working.

From the chart, below it is visible that the bigger companies have more possibilities to defend themselves from this problem (Figure 10).

**Figure 10.** The companies cannot defend themselves from national currency devaluation risk.

*Source: author*

There was question about perspectives of their business (Figure 11).
On the same question for the next year the answers were as in Figure 12.

And here is given one more chart with the same question only showing the situation of companies which use foreign currencies and which do not (Figure 13).
During next year your business will:

Not use foreign currency
- expand
- no change
- decrease

Use foreign currency
- expand
- no change
- decrease

Figure 13. Expectation of their business developing in the current circumstances.

Source: author

The respondents were asked to rate the problems of business. The rate of each problem was calculated by weighted average. The results are given in the chart below (Figure 14).
We were giving to respondents’ definition of currency regimes and asked to answer which of them could be better for Georgia. The results are given in the chart below (Figure 15).

**Figure 14. Rate of business problems**

*Source: author*
Conclusion

Our research shows that the currency regime is very sensitive question for every business and they have problems because of the risks of currency’s value. Most businessmen think that the current regime for national currency is not suitable for Georgia and it would be better to have another one (more than 80% think so). Most of them believe that currency’s fixed exchange rate would be better (as Steve Hanke advices), and the full dollarization is preferred only by 12.2% of respondents. But here should be mentioned that this outcome is a result of a mistake people often make: national currency is understood as an object of national identity. Excluding this factor, one could say that the percentage of respondents supporting the floating regime (17.4%) would be reduced and share of others would be increased.

These results were anticipated as the tool of exchange needs to be durable but it is not. Even in the USA, if anyone looks for US dollar it is easy to see that durability is much less than it was even in 19th century:

- Inflation in 1819 - 1919 was 12.50%
- Inflation in 1919 - 2019 was 1371.48% (CoinNews family, 2019).

Georgian Lari was issued in 1995. In the period of the existence of Georgian Lari the inflation of US dollar was 68.3% (CoinNews family, 2019) - quite big by itself. But for Georgian Lari for the same period of time inflation was 281.38% (Georgia, 2019).

Inflation in last 24 year for US dollar and Georgian Lari:

- US dollar inflated 68.3%
- Georgian Lari inflated 281.38%

This indicator shows too big inflation rate to save in this currency and consequently less trust to the currency from the side of business subjects, especially in case of non-stability of surrounding area in financial sector which does not give any guarantee that the inflation will continue flatly even tomorrow.

To conclude, Steven Hanke’s advice that the strictly fixed exchange rate relative to US dollar (or to Euro) is better for the economy of Georgia seems to be wise as trust to US Dollar from the side of business subjects is greater than trust to Georgian currency.
An important but open question is of course if the fixed currency regime is the best one or if there exists a possibility to choose another currency regime which is more suitable for the business subjects (and better for the economy of the country).

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LEGAL SAFETY OF THE REPUBLIC OF POLAND

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Abstract Legal security is understood as the protection of vital goods and human interests by means of universally binding normative acts, which should be legible and understandable for their addressees, because the beneficiary of legal security is man. Due to the complexity of this concept, legal security can be considered from different perspectives in both formal and institutional terms, which has also been considered in this article.

Keywords: security; law; sources of law

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JEL Classifications: K14, K15

Additional disciplines: political sciences and administration, law.

1. Introduction

The term security has been known to mankind for a long time, although it has changed profoundly for years. Initially, this concept had an individualized character, which could be reduced to the mental state of the individual conditioned by a sense of direct threat in a natural environment unknown to him and the resulting dangers. Over time, this concept began to show inherent links with society, so the resulting normative solutions of a universally binding nature were and are still being directed towards ensuring the optimal safety possible. Nowadays there are distinguished a myriad facets of insecurity (e.g. Moumen et al., 2019; Akhmadeev et al., 2019; Sitdikova, Starodumova 2019; Korauš et al., 2019; Tvaronavičienė, 2018; Lialina, 2019; Prause et al., 2019). Nowadays, legal conditions include complex institutional and legal security systems, which are to be a model of security guarantees for society (Jurgilewicz, Sulowski 2018; Jędrzejowska-Schiffauer & Schiffauer, 2017).

The universal security context perceived in the individual aspect allows to draw attention to feelings formulated by individuals, which include, apart from objectively perceptible elements, also subjective sensations conditioning the state of safety or danger. An individual, therefore, for the sake of participation in society, as well as the degree of information, will display appropriate attitudes conditioned by the level of security. The behavior of an individual in public space is a derivative of various factors affecting him, which, together with his feelings, including above all a sense of legal certainty, as well as opportunities to meet needs, can be seen in terms of legal security (Misiuk, 2013; Jovovic et al., 2017).
2. The importance of legal safety and state safety

Therefore, when talking about legal security, one should remember about its usefulness for securing vital goods and human interests, which are under their jurisdiction, because the beneficiary of legal security is undoubtedly human. Considering the notion of legal security, it is possible to introduce a model distinction between legal security in formal and institutional terms. The first of these - legal security in formal terms - can be derived from the content of existing legal solutions, i.e. applicable legal acts of various ranks, in particular acts, international agreements or ordinances, which regulate the majority of public and legal areas. Therefore, legal security of an entity in formal terms occurs when the provisions of the law generally applicable in its content regulate a given area of an individual’s life. In such a case, it is possible for the entity to effectively enforce the right due to it, which was granted by means of a legal act both in court and pre-trial (e.g. as a result of an agreement between the parties). From this perspective, we can also talk about the legal security of the Republic of Poland, which in formal terms has been successfully reduced to the applicable division of sources of law. According to art. 87 paragraph 1-2 of the Polish Constitution of April 2, 1997, the sources of universally binding law of the Republic of Poland are: the Constitution, statutes, ratified international agreements, ordinances, and acts of local law - in the area of activity of the bodies that established them.

And so the Basic Law is an example of a legal act that stands highest in the hierarchy of the system of sources of law. Its position results not only from its position in the hierarchy of normative acts specified in the catalog of art. 87 paragraph 1 of the Polish Constitution, but also from the content of art. 8 of the Polish Constitution, which states that the Basic Law is the highest law of the Republic of Poland, and its provisions are directly applicable, unless it provides otherwise. In addition, from the so-called of ordinary laws, the Basic Law differs in that it has a special name, content and supreme legal force. It follows that no other legal act may have the same name as the constitution, its content covers all political issues centered around the principles of the state system, organization and structure of public authorities, as well as human and civil liberties and rights, and the subject of its normalization is primary and unlimited.

In addition, the only procedure for amending the Basic Law was specified. According to art. 235 of the Polish Constitution: a bill to amend the Constitution may be submitted by at least 1/5 of the statutory number of deputies, the Senate or the President of the Republic, it shall be amended by means of an act adopted in the same wording by the Sejm and then within no more than 60 days by the Senate.

The first reading of the bill to amend the Constitution may take place no earlier than the thirtieth day after the date of submission of the bill to the Sejm, and the Act on its amendment is adopted by the Sejm by a majority of at least 2/3 of votes in the presence of at least half of the statutory number of deputies and the Senate by an absolute majority of votes in the presence of at least half of the statutory number of senators. In turn, the President of the Republic of Poland signs the act within 21 days of the day of presentation and orders its publication in the Official Gazette of the Republic of Poland. The basic condition for the entry into force of not only the Polish Constitution, but also ordinary laws, international agreements, ordinances and acts of local law is their publication.

As for the laws, it should be noted that their main feature is the implementation of the provisions of the Polish Constitution. The Act can regulate any type of issue if there is no explicit prohibition in this respect in the Basic Law. On the other hand, when it comes to the way bills are drafted, a clear legislative path is foreseen in the Constitution of the Republic of Poland, with no other authority than the parliament authorized to issue a legal act called the act. Another source of universally binding law - international agreements - also form part of the legal order, as they have been indicated in art. 87 paragraph 1 of the Polish Constitution. It should be emphasized that ratification of the international agreement by the Republic of Poland and its termination requires prior consent expressed in the Act, if it concerns:

- peace, alliances, political or military arrangements;
- freedoms, rights or obligations of citizens as set out in the Polish Constitution;
- Poland’s membership in an international organization;
• a significant financial burden on the state;
• matters regulated by statute or in which the Polish Constitution requires a statute.

It should be added that the ratified international agreement, after its publication in the Journal of Laws of the Republic of Poland, forms part of the national legal order and is directly applicable, unless its application depends on the issuance of the act, as well as the fact that if it is a ratified international agreement with prior consent expressed in the act, then it has priority over the act if it cannot be reconciled with the contract. However, according to art. 92 of the Polish Constitution, ordinances are issued by the bodies indicated in the Basic Act, on the basis of a detailed authorization contained in the Act and for the purpose of its implementation. The bodies directly equipped by the Constitution of the Republic of Poland with the power to issue regulations include:

• The President of the Republic of Poland,
• The Council of Ministers,
• Prime Minister,
• ministers managing government administration departments,
• National Broadcasting Council.

The authorization to issue a regulation is always included only in the act, and should also specify the authority competent to do so. In addition, regulations may not violate the norms of the Constitution of the Republic of Poland, the act on the basis of which it was issued, and other binding acts regulating the matters constituting the subject of the regulation. Such violation may consist, for example, in exceeding the scope of statutory delegation, which is expressly prohibited in the Polish Constitution. Among the sources of universally binding law, the legislator also listed acts of local law, while the territorial scope of their validity depends on the area of activity of the authority which establishes them. The legislator did not specify in the Basic Law the names of generic acts of local law, however, by querying normative acts regulating the functioning of individual territorial self-government units in Poland and government administration in the field, it can be indicated that the group of these acts primarily includes:

• resolutions of the resolution bodies of local government units (commune and poviat council or voivodship council) regarding, for example, the budget of the local government unit, local taxes and fees, etc.);
• order regulations adopted by the resolution bodies of local government units or, in urgent cases, by executive bodies in the commune (commune head, mayor or city president) - in the form of an ordinance;
• ordinance ordinances of voivods issued pursuant to the Act on the voivode and government administration in the voivodship;
• acts of local law enacted by unassisted government administration bodies, referred to in the Act on the Voivode and Government Administration in the Province (Haczkowska, 2014).

Sources of law also include internally binding normative acts, to which the law more effectively includes both the resolutions of the Council of Ministers, as well as the ordinances of the Prime Minister and ministers, which, unlike the sources of universally binding law, bind only entities subordinate to the body issuing these acts.

Thus, acts of internal law cannot constitute the basis for decisions regarding citizens, legal persons and other entities, as well as are subject to control as to their compliance with generally applicable law, and their catalog is open, as there may be various types (e.g. regulations, statutes, etc.). In addition, it is worth adding that in addition to the dedicated catalog in Chapter III. The Constitution of the Republic of Poland also refers to sources of universally binding law elsewhere in the Constitution.

According to art. 234 of the Polish Constitution, the President of the Republic of Poland was given the prerogative to issue ordinances with the force of statute, provided that the Sejm cannot meet during a martial law. The President was also given the right to issue a special regulation, i.e. an ordinance on the introduction of martial law or a state of emergency, as determined by Article 231 of the Polish Constitution. The Sejm has the right to
repeal them by way of a resolution, but what is important, the wording of this norm makes it possible to regard certain resolutions as acts of universally binding law, although, as a rule, resolutions other than acts of local law belong to sources of internal law, so only organizational units subordinate authority issuing these acts, as clearly indicated in the content of art. 93 item 1 of the Polish Constitution.

However, when considering the legal security of the Republic of Poland in institutional terms, the implementation (application) of practice of universally binding law by public authorities and bodies, as well as the issuing of judgments by judicial authorities in accordance with generally applicable law, should be taken into account. In this aspect, we can also talk about the so-called legal certainty, which is fundamental to society. This occurs when the implementation of the content of universally binding law takes place in a socially desirable manner, and the content of normative acts, mainly of statutory status, is legible and understandable for their addressees. The state, acting through authorized bodies belonging to the public authority, is obliged to act as the so-called active legal security entity. It is a matter of the obligation to guarantee the safety of any entity under its jurisdiction. In turn, the entity is a passive legal entity.

At the same time, by pointing to security as a human right, one can see the individual’s relationship to the state in which their claim to legal security is emphasized. Thus, the implementation of universally binding law is carried out by authorized entities of public authority, which should include, from the position of the Constitution of the Republic of Poland, organs belonging to the executive branch, i.e. the President of the Republic of Poland and the Council of Ministers (Potrzeszcz, 2015).

Thus, the implementation of universally binding law is carried out by authorized entities of public authority, which should include, from the position of the Constitution of the Republic of Poland, organs belonging to the executive branch, i.e. the President of the Republic of Poland and the Council of Ministers. The President of the Republic of Poland, performing numerous functions and performing various tasks, is obliged to perform provisions arising from the Constitution of the Republic of Poland, which can be cataloged. Then they will refer in particular to: extraordinary legislation and ordinary foreign relations, personal and administrative-organizational rights, as well as the issuing of individual acts. According to art. 126 of the Polish Constitution, the President of the Republic of Poland is the highest representative of the state and a guarantor of the continuity of state power. He has the duty to ensure compliance with the Polish Constitution, guard the sovereignty and security of the state and the inviolability and independence of its territory. The scope of his rights has been determined by both the basic act and the special laws, which means that he has both general competences and powers, which are implemented in situations of special threats and in emergency situations. Among the main powers of the President of the Republic of Poland of a general nature serving the implementation of ongoing tasks in the field of his duties include, among others the right to legislative initiative, the right to sign or refuse to sign a given act, the right to submit an application to the Constitutional Tribunal for a declaration of compliance of a normative act with the Constitution of the Republic of Poland, the right to convene the Cabinet Council in matters of particular importance, as well as the right to issue ordinances and orders. In turn, the President of the Republic of Poland has a broader scope of powers in the event of particular threats to national security, then he has the right to issue a resolution on the state of war if the Sejm cannot gather for a meeting or order to defend the Republic of Poland - at the request of the Prime Minister - universal or partial mobilization and use of the Armed Forces (Jurgilewicz, 2017).

However, in situations of particular threats, when ordinary constitutional measures have already become insufficient, it is possible to introduce a state of emergency on part or all of the state’s territory. There are three types of emergency states, i.e. martial law - introduced in the event of an external threat to the state, armed attack on the territory of the Republic of Poland or when an obligation to joint defense against aggression arises from an international agreement, a state of emergency - introduced in the event of a threat to the constitutional system, security of citizens or public order or the state of natural disaster - introduced in order to prevent the effects of natural disasters or technical failures bearing the signs of a natural disaster and to remove them.

The next body of executive power is the Council of Ministers. This is an example of a collective body composed of the Prime Minister and ministers (the Council of Ministers may also include: vice presidents of the Council
of Ministers and chairmen of committees specified in statutes). General regulations regarding the Council of Ministers are indicated in Chapter VI. The Polish Constitution, however, its organization, mode of work and scope of activity of individual ministers are specified in the Act on the Council of Ministers. And so the Council of Ministers conducts the internal and foreign policy of the Republic of Poland, while its scope of competence includes matters of state policy that have not been reserved to other state organs and local government.

In addition, the Council of Ministers manages the government administration, in turn, in the scope and on the principles set out in the Constitution of the Republic of Poland and other acts, its task is in particular: to ensure the implementation of laws, coordinate and control the work of government administration bodies, protect the interests of the Treasury, adopt the draft state budget, manage the implementation of the state budget and adopt the closure of state accounts and the report on the implementation of the budget, exercise general management in the field of relations with other countries and international organizations, conclude international agreements requiring ratification, and approve and terminate other international agreements, exercise general management in the field of national defense and specify annually the number of citizens appointed to active military service, as well as ensuring external and internal security of the state, as well as public order. The Council of Ministers is authorized to take legislative initiative, and in order to implement laws and on the basis of separate authorizations, it also has the right to issue executive acts (ordinances). In addition, the Council of Ministers also has certain powers in the area of preventing the effects of natural disasters or technical failures that have the characteristics of a natural disaster. It may then introduce the territory of the whole country or part of it of a state of natural disaster. On the other hand, an example of a body included in the Council of Ministers, which was indicated separately in the Constitution of the Republic of Poland, is the Prime Minister. Administratively, he has a dual role because he is the chairman of the collegiate body - the Council of Ministers, as well as an independent, supreme body of state administration, equipped with its own scope of competence. The tasks of the Prime Minister include:

- representing the Council of Ministers and managing its work;
- issuing ordinances;
- ensuring implementation of the policy of the Council of Ministers;
- determining the methods of its implementation, coordination and control of the work of the Council of Ministers;
- supervision of local government within the limits specified by law;
- performing the function of official superior of government administration employees.

In turn, the competences of the Prime Minister, as a single-person supreme body of public administration, cover various areas of public life, e.g. he has the right to issue regulations and ordinances, performs personnel functions by appointing e.g. heads of central offices and voivods, as well as oversees some central government administration bodies. In addition, in the Act on government administration departments, the legislator pointed to central organs (offices) of government administration, which operate in the scope of assigned departments, and supervision over them was granted to individual ministers managing a given administration department, but there are also organs (offices) not included in the scope of departments administrations over which supervision is exercised by the Prime Minister. The difference between supreme and central organs is that the managers of central organs are not part of the RM, although their scope of competence and tasks covers the territory of the whole country. It is also worth mentioning that the implementation, as well as lawmaking, as already mentioned, is also carried out by the bodies of local government units.

Territorial self-government is the basic link in decentralized administration that carries out public tasks not reserved by the Constitution of the Republic of Poland or an act for bodies of other public authorities. The authorities of territorial self-government units (communes, poviats, voivodships) include: self-government community, self-government community bodies, i.e. constitutive and control bodies (commune, poviat and voivodship councils) and executive bodies, i.e. the head of commune, mayor, city president, staroste and marshal voivodships. Speaking of institutional legal security, one should also mention the role of judicial power, which is exercised by the courts and tribunals in the Republic of Poland. The courts and tribunals are an example of a
separate authority that is independent of other authorities, and their role is to issue judgments on behalf of the Republic of Poland, i.e. adjudication on the basis of universally binding law, which is also a manifestation of the implementation of the law and thus constitutes the implementation of the legal security of the Republic of Poland (Chmaj, 2003).

3. Summary

To sum up, the legal security of the Republic of Poland in formal terms can be assessed from the perspective of universally binding sources of law, which have been specified in the Polish Constitution. In the constitution, the legislator established the hierarchical structure of the national legal order, while the rank of individual normative acts, i.e. their place in the system of sources of law, can be generally presented in the order from the highest to the lowest legal force. Therefore, the issues of sources of national law (EU law was deliberately omitted due to the limitation of consideration of sources of law specified in the Constitution of the Republic of Poland) were clearly legible, which is a desirable manifestation of the legislative solution. On the other hand, the legal security of the Republic of Poland in institutional terms, although it has been outlined in general, nevertheless proves that there are a number of authorities at various levels that are obliged to implement the law in practice.

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FACTORS OF REGIONAL SYSTEMS COMPETITIVENESS

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Abstract. National competitiveness is a multisided concept that includes a system of indexes, indicators, criteria, conditions and factors of development, mechanisms of its improvement. Competitiveness consists of a number of components that supplement each other and ensure steady economic growth, improving the welfare of the population. These are: science and education, innovation and investments, various infrastructure, real economy sector, small business, various services, natural and human resources. The objective of necessity to perform reforms at the regional level and the natural increase of the role of the regions in reforming the economy are predetermined by the fact that the ability of state bodies, ministries and departments to influence the course of reforms is gradually limited, and the new market mechanism is not working enough effectively yet. This shows the necessity of determination of the role and place of the region in the economic space, its potential possibilities and development prospects.

Keywords: economy; region; factor; conditions; competitiveness; measures; approaches; analysis; territory; groups; mechanism; interaction


JEL Classifications: O10

1. Introduction

The main aim of the executive authorities in the regional economy is to provide the population with a sufficiently high and decent standard of living level. The ability of regional and local government bodies to do so depends on how much their own resources are productively used - labor and capital. Representatives of the regional authorities are fighting at the level of state bodies for providing the region with more favorable economic conditions in comparison with others, lobbying the interests of large structure-forming enterprises of the region, looking for a possibility for independent establishment of international relations, trying to protect local producers with administrative measures (Abylkasimova et al., 2019).

There is a competition between regions, although it takes place in different forms and has got a bit different consequences than at the micro and macro levels. This can be seen in the case of the main entities of the region, when the enterprises of the region compete: a) within the region with each other; b) within the region with enterprises of other regions and countries; C) with competing regions; d) in the CIS market and the world market (Alina et al., 2018; Tvaronavičienė, 2019).

It is necessary to add the following: it is impossible to count on reasonably high competitiveness of the region if the basic balances of political, social and economic character are not regulated. In this regard, we can state with confidence that the main level of competitiveness - macroeconomic, which determines the basic conditions for the functioning of the whole economic system in the region (Mizanbekova, Mizanbekov, 2018).
2. Methods of research

For each region, it is important to know what factors contribute to improve competitiveness in order to be able to manage them, and to refuse unpromising competition in those areas where there are almost no chances of attracting or preserving the consumer.

The world Economic Forum in the TACIS programme published the “Structure of competitiveness factors” which in our opinion can serve as a model or starting point for determining the policy directions of the region to improve its competitiveness: government; internal economic strength; infrastructure; science and technologies; availability and qualification of human resources; finances and financing; management; internationalization.

Except the selected factors that determine the direction of the formation of regional policy, forms of construction (organization) of business make significant influence to the competitiveness: diversification; restructuring; clustering. However, in the composition and formulation of the factors that determine the competitiveness of the region competitiveness has a high social and economic significance (Tireuov et al., 2019).

The driving forces that determine the competitive position of the region are: clusters, social and entrepreneurial corporations, special zones; human resources; business environment of enterprises work, difficulty of the tax burden; innovation (regional innovation systems – business incubators, technology parks, technopolises, etc.); regional management, management and institutional possibilities; sectorial structure of the region, types and forms of enterprises; production and social infrastructure; typology of regions and the level of integration of firms; internationalization of the region; attractiveness for investment; geographical and geopolitical position (Ohotina et al., 2018; Kiseľáková et al., 2018; Petenko et al., 2019; Amraoui et al., 2019; Bublienė et al., 2019).

3. The discussion of the results

In the new social and economic environment, the competitiveness of entities at all levels of the economic system depends on the synergetic effect provided by a wide range of specialized industrial, technological, financial, commercial, administrative and cultural possibilities, knowledge and skills located in different regions of the world. Nowadays social capital of the territories which attracts more attention of scientists and practitioners makes a significant contribution to the general effect.

It differs from other forms of human capital as it is created and transferred through cultural mechanisms, national mentality and accumulated more difficult than other forms of human capital. Social capital is unequally distributed among different societies and territories and these differences have got an impact on economic development of the territory.

It is necessary to consider the competitiveness of the region as a phenomenon which is dynamically developing in time. This means that various factors perform the role of “driving force” at different times and for different regions (Dudin et al., 2019). A systematic view of the competitiveness of the region has allowed us to discover possible approaches to the definition of factors. The main groups of factors to which the information component is added today are identified from the viewpoint of the resource approach. Focusing on the entities of economic activity gives an understanding of the role of participants in regional production in the national economy.

The appeal to structuring predefines appearance of structural factors that describe regional economy and its infrastructure. Another approach to the development of the regional system reveals in it the institutions that determine the regularities of functioning, the principles of work that assign possibilities and limitations.

The indicated approaches and their substantiating criteria are presented in some degree in the existing lists of factors of regional competitiveness. It is especially necessary to position the factors that arise not as a consequence of existence of business entities and facilities but as result of emergence and keeping of inter-
actions between them and as the mechanism of interdependence at the level of vertical and horizontal communications.

Analysis of development trends of business competitiveness showed that the relationship between economic agents in the modern world in order of importance come to the fore. However they are practically absent in all scientific works or given within the framework of resource, structural groups. Our vision of the region’s competitiveness factors is given in the form of a classification (table 1).

Factors of competitiveness can be divided into external and internal. In our opinion the most important external factors of competitiveness are the investment climate, the level of competition in the interregional and international markets, the geography of productive forces. Quality of management, innovative strategy of the firm, investment directions, labor relations and qualifications of employees, ownership structure and others belong to the internal factors of competitiveness. The investment climate as an external factor of competitiveness has got an essential influence on production costs, the level of which depends on the position of the firm in domestic markets and in relation to competitive countries.

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Competition is the main external factor of competitiveness. There is no competition in natural monopoly sectors. Low level of competition leads to innovative passivity, technological lag, high costs, and reduction of competitiveness. For instance, the degree of fixed capital depreciation in the country on average exceeds 30-40%, and the coefficient of renewal does not exceed 2-3%. The measures taken to develop competition at the sectorial and territorial level are not enough as they do not have a proper influence on the competitiveness of firms.

It is necessary to note another important external factor of competitiveness – geographical location of enterprises that forms a regional polarization in the level of competitiveness, spatial inequality in the competitive advantages of getting access to tight resources (quality labor force, sources of investments, energy, construction industry, etc.).

Investment and innovation activities of firms are the most important internal factor of competitiveness. (Bezpavalov et al., 2019). However, as it has already been noted, fixed capital in the vast majority of enterprises has got a high physical and moral deterioration, and investment activity of enterprises remains very low. Many innovative products and technologies of domestic and foreign scientists are not used. It is obvious that mecha-
nism of stimulating innovative activity of enterprises is not created at the proper level, which is obliged to assist
to accelerate technical and technological development through preferential taxation and lending, to allocate
funds for the introduction of scientific and technological achievements in the production, to give moral and
material encouragement and other methods of financial support for firms that not only introduce domestic and
foreign innovative products, but also actively carry out research and design works.

At the same time viability of priority financial support for new enterprises equipped with advanced technology
is obvious rather than existing ones, burdened with the traditional structure of fixed capital.

One more internal factor of competitiveness is the effective use of investments.

Labor relations and qualification of employees are considered to be an essential internal factor of competitiveness. It should be noted here that market laws have got a significant influence on the production relations in the sphere of labor resources and increase the requirements for the quality of labor force. In market conditions, where there is competition and intention for maximum profit, firms have to search ways to reduce production costs. Due to limitation of funds for renewal of fixed capital firms are trying to reduce costs through saving fluid capital, including a reduction of the number of employees, a reduction where possible, in wages, funds for social development, labor safety and security.

At the same time there is an acute shortage of skilled personnel of working professions because of the termination of many vocational schools work. In order to solve this problem, investments for external and internal training are allocated what is a necessary condition for supporting competitiveness (Adamczyk et al., 2019).

Finally, structure of property, quality of functioning of public services, industrial and social infrastructure make influence on the competitiveness of the region. These factors indirectly affect the change of competitive positions of the territory through the living conditions of the population.

It seems that competitiveness can be defined as the ability to create conditions for steady development of the region. Two concepts - “competitiveness” and “steadiness” are interrelated and interdependent as the first is the main indicator of steady development of the region. The higher its level, the higher the degree of its steadiness and assessment of the factors of its competitiveness development, the possibility of effect of the regional administration on its components.

It is reasonable to use the model of “national rhomb” proposed by M. Porter. According to this model, the role of the region in creating competitive advantages can be researched in four interrelated directions (determinants) that form a “regional rhomb” (natural resources, capital, skilled workers, infrastructure). We have added two more - information and entrepreneurial talent. Conditions of the demand include the level of income, elasticity of demand, demands of customers to the quality of goods and services. Related and supporting sectors provide the enterprises with necessary resources, components, information, banking, insurance and other services.

Strategies and competition create competitive environment and develop competitive advantages. Based on this model we made a scheme of six main parameters, taking into account the effects of internal and external environment that affect the development of competitiveness in the region (Picture 1). It is seen from the diagram that each of the parameters is in relationship and interaction with internal environment of the region. In the management the external environment is called direct and indirect contacts of the object.
Factors of development of the region’s competitiveness using the possibilities of external and internal environment

It consists of microenvironment (direct contacts) and macroenvironment (indirect contacts). Parameters have got a different degree of influence on the competitive advantage of the region and its further development (Abasheva, Sulaev, 2019).

We consider development of the region’s competitiveness in four stages: competition based on factors of production; competition based on investment; competition based on innovation; competition based on wealth.

In modern market conditions, it is reasonable to take the level of investment with further transition to innovative development of the region as a basis. Today there is an objective necessity and the demand to fill the region with innovations of the attracted investments. Scientific knowledge, education, factors of production development, factors of formation of innovative potential have got a great importance in creating a competitive advantage of the region (Cheung, de Haan, 2013).

The first three stages ensure economic growth, the latter conditions growth in the future. In our opinion it is possible to take the criteria which characterize the level and quality of life of the population: income, education, health, environmental conditions as a basis in determining the competitiveness of the region.

The potential of the region is realized as a result of the functioning of the regional market which should involve all available own resources in the reproduction process and effectively use them. Special attention should be paid to the regional market, the system of prices through direct and reverse links operating in competing regional markets and thus a single market and pricing system conforming to this market is gradually formed.

This process is sophisticated and long-standing as there are attempts of some regions in order to solve their economic problems with the help of favorable prices at the expense of other regions (in the extraction of fuel and raw materials, in oil refining or construction). Further through the pricing mechanism in each market segment (labor, resources, goods and services, financial) prices are set which reflect both the cost of the main factors of production and the cost of ready products and services.

The pricing mechanism in the region refers to the process of pricing in certain segments of the regional market taking into account the influence of state and regional managing bodies on economic entities.

During determination of the region’s competitiveness supply chains were studied (Wen et al., 2018). They determine the consistency and interrelation of the regional market through the pricing mechanism having ensured the competitiveness of the region and steady development.

Enterprises themselves have to create and get a competitive advantage in the regional market. Local authorities are not able to form or influence sufficiently on the institutional structures that are surrounded by the enterprises working there, however they must create the conditions that allow businesses to achieve competitive advantage. It is reasonable to note that the regions reach absolute and comparative advantages due to their differences, not the similarities. Each region has its own specific set of competitive sectors.
As a result, it can be supposed that in the region where the sectorial structure of the economy has adapted faster to market methods of economy, where the administration supports the structure-forming enterprises and performs a reasonable economic policy, the pricing mechanism provides a balance of regional demand and proposals and contribute to the growth of competitiveness of the region.

The volume of GDP in 2018 comprised 59 614 billion tenge, according to forecasts, in 2019 the growth of real GDP can comprise 3.2-3.9%. The key sectors of Kazakhstan’s economy are trade (17%), production and processing of oil and gas (15%) and other processing productions (11%). The share of the sectors related to oil and gas field in GDP comprised 21%.

The average gross value added per one employed in the economy of Kazakhstan comprised 6383 thousand tons in 2018. In 2018, the average nominal salary in Kazakhstan reached 176,000 tons per month which is 17% higher than in 2017, the net inflow of foreign capital comprised $23 billion. Key investors in Kazakhstan are the Netherlands (30% of total foreign investment), the USA (22%) and Switzerland (10%). More than half (56%) of foreign investments are in the extractive industry, namely – oil and natural gas production (50%). Kazakhstan’s export of goods exceeds the import almost double. The main trading partners are Russia (19% of the total turnover of the country) and Italy (14%). Key categories of the export: oil and oil products – 70%; metals and their products – 14%; food products – 5%. Key categories of the import: machinery and equipment – 40%; products of chemical sector – 16%; metals and their products – 13%.

The regional market is the initial category for the analysis of regional competitiveness. In this regard, the economic category “competitiveness of the region” is considered with further access to the features of the pricing mechanism. The increase in the living standard of the population identified as the main criteria for the competitiveness of the region mainly depends on the level of its income (salaries, social payments, benefits) which are formed in the labor market.

The research of the region’s economic growth and real standard of living of the population in the region involves the measurement of income, first of all salaries with prices in the market of goods and services. Salaries being an element of production costs for the region mainly depend on the efficiency of its production. In the context of this, it is necessary to note that the leading role in achieving the competitive steadiness of the region belongs to clusters. According to the classical definition, clusters are geographically concentrated groups of interrelated enterprises, specialized service providers and also uncommercial organizations and institutions related to their activities in certain areas which compete but at the same time complement each other (Mogilevskii, Akramov, n.d.).

Particularly clusters create the critical mass that is necessary for competitive success in many fields. Clusters are a characteristic feature of any well-developed economy and that is why they are an essential component of economic development.

Use of the cluster form of business organization is most essential at the regional level due to the necessity for close contact between the cluster members which presumes some territorial unity. Location in one territory allows not only to meet quickly, discuss a common task, quickly solve the problem, but also to determine that direction of activity which is the most competitive for the region now and will be beneficial in the future.

Besides, the region has got a strong joint advantage if it has well-functioning institutional and communication networks, public-private partnerships that are adapted to the needs of the business world. All this encourages the development of interaction, exchange of information, initiatives in regional economic structures, stimulates synergy, and generates new knowledge and ideas.

In order to identify the possibilities of cluster technology it is necessary to analyze the competitive steadiness of enterprises in the region, which is understood as the strengthening of the positions of economic entities in
this environment, their ability to support their own competitiveness in the long term using the possibilities of the external environment. Assessment of the potential and success of clustering in the region assumes quantitative analysis of statistical data and qualitative analysis of the availability and composition of the resource base, sectorial specialization necessary to provide competitiveness in certain areas.

It is necessary to note the viability of the analysis of the competitive steadiness of the region, supplemented by the analysis of the competitive steadiness of the field, that is, a group of enterprises in the region which produce homogeneous or technologically almost homogeneous products. It is also necessary to pay attention to the possibility of creating production chains from the processing of raw materials to the ready product.

The economic behavior of any region and also economic entities of all ownership forms is now viewed through the prism of increasing regional competitiveness through preserving and using existing, creating and realizing new competitive advantages. Regions compete in order to attract and retain companies, skilled personnel, private capital and investments, state funds and clients (Nifontova, 2019).

The region will have absolute competitive advantages if: 1) it has got the best technological, institutional and infrastructural and social assets; 2) these advantages come from outside but work for the benefit of certain firms; 3) there is such state of things in which even in case of changes of pricing factors of geographical redistribution of economic activities will not occur (Nedim et al., 2018). The given set of signs of competitiveness of territorial education shows the presence in the territory of certain properties that are in demand or particularly appraised by the consumer. In this way, correspondence with these requirements and the level of characteristics of the region determine its competitiveness. Certainly, competitive positions of the region are determined by the competitiveness of fields that make up the structure of its economy and located on the territory of enterprises, firms, companies, institutions, etc.

Analysis of the region’s economic environment allows to identify the conditions more completely that contribute to the development of competitiveness in the current social and economic conditions. The region’s economy is an economic complex, an integral territorial economic system where the leading role belongs to the fields of market specialization. It is necessary to consider the region not only as a set of natural, human, financial, production resources, but also as a subject of social and economic relations, able to self-management which allows us to talk about the management of competitiveness at the regional level and the economic environment of the region should be understood as a set of sectors in their ratio and dynamics.

As large entities of property and economic activity regions become participants in the competition in the markets of goods, services and capital. The region as an economic entity interacts with national and transnational corporations. Location of headquarters and branches of the corporation, their pricing mechanisms, distribution of working places and orders, transfers, revenues, taxes, etc. make a strong impact on the situation of the regions.

At the present moment, domestic and foreign researchers have accumulated some specific experience in analyzing the competitiveness of territorial structures. Thus, in the United States only, one of the most widespread forms of such assessment of states and cities is the annual development of so-called statistical maps containing four generalizing indexes: the index of economic effectiveness, the index of business viability, the index of growth potential, the tax and fiscal index (Gurban, 2015).

The method of analysis of the regional economy is also widespread through the comparison of competitive advantages. In this case evaluation of the development level of the territory is made on the basis of such criteria as the availability of natural resources, availability of raw materials, geographical location, qualification of the labor force, the availability and condition of fixed assets, the development of regional consumer and financial markets, the policy of local administration, the level and quality of life.

Various researches are carried out in order to identify the main trends in the development of regions, evalu-
ate their level of development to make further offers to improve competitiveness including: a comprehensive analysis of the development of the region as a component of the social and economic system of the country; a retrospective analysis of the economic development of the region as an independent economic agglomeration; an integral estimation of the potential of the region.

At the same time the following principles of evaluation of the region’s competitiveness are used in the analysis: 1) presence of purposes and objectives of the regional system, their realizability; 2) development of methods of indicative planning by regional structures and the reality of plans; 3) optimality of the division of powers and responsibilities of various bodies; 4) skillful regulation of economic entities in the territory, effective control of the execution of all programs and projects in the region (Savrukov, Savrukov, 2017).

At the stage of innovative development for Kazakhstan the most important task is to improve the structure of the economy of the country and its regions, to provide effective functioning and big resulting of the invested labor and capital (Dnishev, Alzhanova, 2015). Such orientation is in line of State programs and evaluation of the region’s level of development is very important for us as this constitutes the integrity of the country.

The choice of indicators for the analysis of the regions’ competitive positions was executed in the following sequence: stage 1 - determination of the comparison base in conformity with the purpose of evaluation; stage 2 - measurement of the level and dynamics of to be estimated indicators; stage 3 - checking of the results of the 1st and 2nd stages for comparability; stage 4 - formulation of the final evaluation of the level and dynamics of indicators.

During analyzing the level of the region’s competitiveness it is necessary to pay attention to: formation of equal institutional conditions, overcoming differences in the level of the regions’ economic development; sectorial principle of the region’s specialization, restructuring of the economy in compliance with the innovation and investment policy of the country and also medium-term and long-term programs of economic reforms; strengthening the integrity of the development of the region’s economy, widening of the use of progressive forms of spatial organization of production and distribution of the population (Tvaronavičienė, 2018.)

Conclusions

Analysis of various aspects of the regional economy is directed to identifying the strategy of competitiveness of regional systems (Fedorova et al., 2019). In the analysis of regional economies at the regional level the same macroeconomic indicators are applied as in the analysis of the national economy.

Analysis of the territorial structure of the country’s economy allows to evaluate how the distribution of population, national wealth, production, consumption, income and also how strong their competitive position is, the growth of the mentioned indicators runs the growth of the population much more ahead. The main prerequisites of the current trends are a favorable investment climate, rising of prices for industrial products, realization of measures for import substitution, realization of infrastructure programs, provision of tax incentives and preferences in the processing spheres, expansion of consumer demand due to income growth.

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MANAGEMENT OF PROTECTIVE INFRASTRUCTURE IN PRISONS AS AN ELEMENT INCREASING SAFETY OF PENITENTIARY EMPLOYEES

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Abstract. By fulfilling their tasks, employees of isolation institutions contribute to the subjective sense of security of citizens. At the same time, the staff of these institutions and their dependents become a security entity which, due to the dynamically changing sense of danger on the part of prisoners, requires active prevention of factors threatening the correct execution of the penalty of imprisonment (aggression against officers, violence against inmates, self-aggression, suicidal behaviors, etc.). In fact, by undertaking a number of preventive measures, staff undoubtedly manages security in penitentiary facilities. It is also important to use appropriate protective infrastructure depending on the type and type of prison. It is worth paying attention to the situation of Polish prisons. Political changes in Poland after 1989 also caused transformations in the prison system. A characteristic feature of these changes is the normalization of relations between prison staff and prisoners. Amendments to criminal legislation, including penitentiary, have adapted the legal situation in prisons to international standards. In theory and practice, attention is paid to a more subjective treatment of persons deprived of their liberty and greater protection of their rights and freedoms.

Keywords: penitentiary institution; personal safety; security management; protective infrastructure


JEL Classifications: K32

Additional disciplines: law

1. Introduction

Penitentiary institutions are places where a group of people staying there with the employees of these institutions (officers, carers, therapists) create a specific climate and microcosm. The two-part community operating in an isolated microworld is doomed to itself around the clock. Staff members are just as hermetic as those under control (convicted, detained on remand, charges) and spend more life in a penitentiary institution than most people they supervise. The only difference is that these communities came to the penitentiary institution for completely different reasons: convicted - because he must, and the staff because he wants. Condemned, because that’s what the court decided, and the staff because they decided to work here. The prisoner found himself in the institution by force, while the staff of his own free will. Coercion and freedom in undertaking various activities are mutually exclusive.

This relationship completely reflects the atmosphere prevailing among the bipolar community of penitentiary...
institutions. Usually, a large population of people staying in a penitentiary institution, by nature, creates a social
system with a complex structure in which elements of formal operating principles are intertwined with elements
of informal relationships in an extremely complex way. A person staying in a penitentiary institution feels the
impact of two polarly different decision systems coming from penitentiary employees and informal stratifica-
tion of the community of isolated people.

2. Personal security management in penitentiary units

The staff of a penitentiary institution has the task of performing various functions for those under care, includ-
ing educational, correctional and resocializing services, etc. The subject of the penitentiary institution is forced
to comply with the staff’s requirements, i.e. a legally sanctioned decision system. The second system having a
significant impact on the functioning of legally isolated people are informal phenomena occurring in peniten-
tiary institutions and they include, among others: informal stratification, various forms of so-called “Second
life”, which can include: aggression, self-harm, the phenomenon of tattooing, etc. All these phenomena are
referred to in literature as the so-called “Prison subculture” (Dolata, 2011)

The prison subculture is an informal, created by people in isolation, various forms of mutual interpersonal
relationships that differentiate convicts into better and worse, which undoubtedly contributes to the threat to
the security of penitentiary institutions, so it cannot be tolerated by staff, i.e. a legal decision-making system.

The phenomenon of the prison subculture is not a new phenomenon. It was known at various times in the develop-
ment of penitentiary institutions. Both moral and legal norms, language of the tattoo, and some institutions,
as specific phenomena of this phenomenon were already known in the nineteenth century and often described
as specific phenomena of this phenomenon (Dostojewski, 2009).

The prison subculture is a dynamic phenomenon that is expressed primarily in the variability and diversity of
its forms, among others in the area of language bustle, tattoos and self-injury of prisoners and has a significant
relationship with the security in penitentiary facilities (Przybyliński 2006).

The penalty of deprivation of liberty and other forms of isolation of persons violating the legal order and threat-
ening the security of other individuals are the furthest-reaching forms of interference in the sphere of human
rights and freedoms. Penitentiary isolation entails many negative consequences for incarnated units, among
which situations and phenomena that pose a threat to the security of charges of penitentiary institutions, as well
as the personnel responsible for creating safe conditions of stay during isolation occupy a special place. Precise
identification of threats to the personal safety of isolated persons and staff is extremely difficult. It should be
remembered that the nature of these threats is not homogeneous, and the intensity and scope of impact varies
greatly. Phenomena and situations posing a threat to personal security include: phenomena associated with the
prison subculture (various forms of aggression, self-harm, tattoo), the process of prizonization, intentional and
unintentional actions or omissions on the part of the administration and the activities of criminal environments
inside and outside isolation units (Szaszkiewicz, 1997).

In Poland, penitentiary units are divided into prisons (87 units) and detention centers (70 units). Over 60% of
prisons and detention centers were built before World War I. After World War II, 23% of units were built or
adopted for the needs of prison. Currently, the infrastructure of penitentiary units is in the phase of moderniza-
tion and expansion, due to the need to increase the accommodation of prisoners and to improve the technical
condition and safety of the residential facilities and administrative penitentiary employees (Knap, 2005). From
the point of view of criminological prevention, the issue of resocialisation of an offender in conditions of insti-
tutional isolation is of significant importance. Among the existing criminal measures, the most controversial is
the imprisonment and conditions for its implementation. For many years, reflections on the usefulness of this
punishment for the correct and effective process of resocialization have been conducted. Solutions to problems
related to imprisonment are sought not only in the practical implementation of the penalty in individual coun-
tries, but also internationally. In reflections on penitentiary issues, there is a great deal of pessimism regarding
the effectiveness of imprisonment as a means of social readaptation.

The postulates are formulated for conducting a thorough analysis of the issue of prison isolation in all its aspects, including in the aspect of broadly understood security. The need to review the theoretical output and empirical research regarding the application and implementation of a prison sentence from the point of view of its effectiveness and enforcement effects should be fully recognized (Hołyst, 2016).

Scientific literature and results of empirical research indicate that in isolation institutions, negative changes in the human psyche, disturbances in the sphere of consciousness, feelings and decision-making occur more often than in normal environments, which in turn leads to behavioral disorders. This is manifested by the already mentioned aggressive and auto-aggressive behavior of people in isolation, threatening not only the safe conditions of serving a sentence, but also the safety of penitentiary employees (Hołyst, 2018). Psychologists examining the conditions of execution of a prison sentence emphasize the inadequacy of the isolation conditions created by the institution to the requirements of the proper mental and physical functioning of the individual. They justify their comments to prisons that man not only lives in a social and natural environment, but also his mental functions can only develop in interaction with the environment. The number and quality of environmental stimuli decide whether these functions will develop better or worse, whether they will operate in a correct or abnormal way (Hołyst, 2016). The conditions in which punishment is carried out in prison result in a failure to meet many needs. Among others, the need for self-realization, self-esteem, security, love, friendship, association and contacts with other people are deprived. As a result, there appears in the mind of convicts a sense of threat to oneself, which is strongly associated with various forms of aggression, including that directed against staff (Kędzierski, 2017).

Prison is a multifaceted and quite complicated institution, and its functioning is part of the criminal policy of the state. In turn, his task is not only to isolate criminals, but also to change their attitudes to pro-social, and thus discourage them from continuing criminal activities. The prison consists of two communities: prisoners and staff. They have different roles and goals. Therefore, there is a conflict interaction between them, which should be minimized at all costs in order to fully implement the task exchange. On the one hand, we are dealing with people who should be treated with dignity, not ignoring the principles of humanitarianism, and on the other, with ruthless criminals who often showed brutality. Therefore, it is not difficult to notice that working in isolation institutions is not easy and safe (Sołtysiak, 2012).

The penalty of deprivation of liberty performs preventive, punitive and educational functions. Preventive impact of punishment should be understood as, on the one hand, isolating the convict from the society preventing further offenses, and on the other, showing the public that the consequence of violating legal norms by committing a crime is criminal liability resulting in prison isolation. The content of the punitive function of punishment is its ailment, by deprivation of liberty, society repays the convict for his crime. Educational functions can be performed by aiming at achieving the goal of punishment of acting on a convicted person (Knap, 2005).

The execution of a prison sentence is aimed at changing the sentenced person, who will stop him in the future from committing crimes. Polish legal regulations in the field of penal law clearly emphasize that a person deprived of liberty, having the right to obtain assistance in pursuing these changes, must demonstrate in this respect their own activity and will to cooperate (Penal Code, 1997).

The penitentiary institution is a place where people who have been convicted with a final judgment of a prison sentence of imprisonment. This penalty consists in the forced placing of a convicted person for a specified period in a closed and guarded place. In addition to having to be in prison. In addition, a person in prison is subject to the rigors arising from the prison regulations, restriction of contacts with persons from outside the prison, limitation and even inability to be released under passes and the application of statutory penalties for offenses against discipline. To sum up the prison, in other words prison is a place where people convicted by a final court sentence serve a prison sentence. However, it should be remembered that prisons are intended for imprisonment, and detention on remand is in custody.
In Poland, in accordance with the Executive Penal Code (hereinafter SQC), prisons are subject to the Minister of Justice, and hence, by means of ordinances and orders, they can create new prisons, both as independent or as separate branches of prisons and detention centers (Code executive penalty, 1997). Four types of penitentiary facilities can be distinguished in Polish penitentiary law, namely facilities for juveniles, for penitentiary repeat offenders, for those serving prisoners for the first time and for those serving a military custody (Holda, 1999). All of these establishments can be organized as closed, semi-open and open penitentiary (Dąbkiewicz, 2018).

The type of prisons determines the category of people for whom a given unit is intended. Individual types differ from each other in the degree of protection, isolation of those staying there, their obligations, permissions to move around the unit, as well as outside it. Importantly, women are imprisoned in separate prisons or in special departments for men’s facilities. In addition, the Polish penitentiary system creates unlimited possibilities for the creation of penitentiary units, which can not only be responsible for the needs of prisoners of certain categories, but can also create the possibility of modeling the conditions of serving the sentence, so as to maximally use the period of penitentiary isolation to achieve corrective goals. (Bulenda, Musidłowski, 2003). There are four types of prison in Poland, namely the prison for: juveniles; serving their sentence for the first time; penitentiary repeat offenders and serving a military custody (Dąbkiewicz, 2018).

The first of these facilities, namely juvenile detention center, was separated in order to isolate convicts from the demoralizing influence of other prisoners, as well as from the belief that the group of juvenile offenders is a group of people who are still in the period of mental and biological development, in connection with which is a great chance, than for adults, of applying yet effective impacts on their attitudes (Stando-Kawecka, 2000). Juvenile detention centers are intended for persons under 21 years of age. If an adolescent has at least six months left to the end of his sentence, he may apply for parole, while an adolescent who has problems with upbringing must undergo psychological examination.

The provisions of the juvenile detention center regulations stipulate that physical education, sports and cultural and world education classes are conducted in this type of facilities, meetings with families and cooperation with trustworthy persons are organized. Convicted persons who are serving a sentence in this penitentiary institution, namely a semi-open and closed type, also have the right to additional visits in a month. This group of convicts, i.e. juveniles, are not subject to more severe disciplinary penalties (Stando-Kawecka, 2000).

The second type of penitentiary institutions, namely the penitentiary institutions for those serving the sentence for the first time, are persons who have not been directed to the juvenile institution, those serving a prison sentence, for penitentiary offenders, as well as convicts who are serving a substitute prison sentence ruled in the same case. Persons who have been convicted of unintentional offenses may also serve their sentences in facilities for those serving the sentence for the first time. Persons in such establishments have the right to benefit from teaching, employment as well as sports and socio-educational activities in a prison. As for the third type of facilities, namely penitentiary facilities for penitentiary offenders, adults who have been convicted of an intentional offense to imprisonment or a substitute sentence of imprisonment and persons who have been punished for intentional, substitute offenses are punished in this type of facilities or basic detention, and this applies to persons who have previously served this type of punishment or military detention for intentional crimes or offenses, unless any exceptional social rehabilitation considerations call for the referral of these persons to the penitentiary institution for those serving the sentence for the first time (Dąbkiewicz, 2000).

The fourth type of plant is military detention, this type of plant applies to soldiers. This type of military detention lasts at least a month and the longest two years. The convict is obliged to study and work. In this type of plant, it is very important to observe military discipline as well as elements of military training. Convicts are placed in different rooms, maintaining a hierarchy regarding the rank of the military. In such facilities, all convicts serve their sentence in full military uniform, but without the national emblem, as well as without military signs and degrees (Dąbkiewicz, 2018).

In addition to the abovementioned facilities, there are also prisons for women, which constitute 3% of the popu-
lation sentenced to imprisonment (Siemaszko, 2009).

Pursuant to Article 70 § 1 of the Penal Code, all types of bets can be organized as open, semi-open and closed bets. Individual types of establishments differ primarily in the degree of protection, the degree of isolation of convicts and, what is important, the resulting obligations and authorizations in the field of moving inside and outside the plant (Article 70 §2 of the Penal Code). The basic scope of the convicts’ rights, which concerns the freedom of movement and the possibility of maintaining contact with the outside world in all types of prisons, are determined by the provisions of the Executive Penal Code and complement them by the provisions of the regulations (Stando - Kawecka, 2000).

Closed type penitentiary institutions (Executive Penal Code, 1997) and pre-trial detention centers are organized as part of a full security system which is characterized, among others, by:

- residential cells of convicts may be open during the daytime for a specified period of time, if security reasons do not prevent it,
- convicts may be employed outside the prison in a full convoy system,
- cultural, educational and sports activities as well as teaching are organized within the prison,
- movement of prisoners around the prison takes place in an organized manner and under supervision,
- convicts may use their own underwear and footwear, and with the permission of the director of the prison - also with clothing,
- convicts may enjoy two visits a month, and with the consent of the director of the penitentiary institution, use them once,
- view of convicts are subject to supervision by the prison administration; conversations of convicts during visits are subject to control by the prison administration,
- correspondence of convicts is subject to censorship of the penitentiary administration, unless the law provides otherwise,
- phone calls of convicts are subject to control by the prison administration.

Semi-open prisons (Executive Penal Code Act, 1997) are organized within a limited protection system which is characterized, among others, by:

- residential cells of convicts remain open during the day, while at night they can be closed,
- convicts may be employed outside the prison in a reduced system escorting or not escorting, including at individual work stations,
- convicts may be allowed to participate in teaching, training and activities therapeutic organized outside the prison,
- convicts may participate in group cultural, educational or sport activities organized by the administration outside the prison facility,
- convicts can move around the prison in fixed times and places in internal order,
- convicts may use their own clothing, underwear and footwear,
- convicts may be granted leave from the prison, not more often than once every two months, for a total of not more than 14 days in a given year,
- convicts may enjoy three visits per month, which may be combined with the consent of the director of the penitentiary institution,
- view of convicts are subject to supervision by the prison administration; conversations of convicts during visits may be subject to prison administration control,
- correspondence of convicts may be subject to censorship of the penitentiary administration,
- phone calls of convicts may be subject to control by the prison administration.

Open type penitentiary institutions (Executive Penal Code, 1997) are organized as part of a simplified protec-
tion system which is characterized, among others, by:

- residential cells of convicts remain open around the clock,
- convicts are employed primarily outside the prison, without an escort at individual work stations,
- convicts may be allowed to participate in teaching, training and activities therapeutic organized outside the prison,
- convicts may take part in organized by the administration, outside the facility criminal, group cultural and educational or sports activities,
- convicts may be allowed to participate in cultural and educational activities and events or sports organized outside the prison,
- convicts can move around the prison in fixed times and places in internal order,
- convicts may use their own clothing, underwear and footwear,
- convicts may receive from the deposit of a penitentiary money at their disposal,
- convicts may be granted leave from the prison, not more often than once a month, in total for a period not exceeding 28 days a year,
- convict may enjoy an unlimited number of visits,
- view of convicts may be subject to supervision by the prison administration.
- correspondence of convicts is not subject to censorship of the penitentiary administration,
- phone calls of convicts are not subject to control by the prison administration.

The functioning of security systems is carried out based on physical protection, and the protective infrastructure used by the Prison Service consists, inter alia, in the application of technical protective safeguards, alarming and communication means. Technical and protective safeguards are mechanical, electrical, electronic and construction safeguards (Macwaldowski, 2014). Construction and mechanical security are a permanent basis and do not change as significantly as the electronic security infrastructure.

The dynamic development and the increasing availability of electronic security systems have made them widely used in ensuring the security of penitentiary units. Gradually, there was a shift away from manning armed posts in favor of electronic monitoring and control systems. The architectural diversity of the facilities of the Prison Service, the location of the facilities within the unit, the use of various security systems means that one solution cannot be adopted to ensure security. Currently used solutions include:

1. Intruder alarm system (SSWiN) is one of the basic alarm systems. In organizational units, he performs the following functions:

   - panic (permanent panic buttons located in the department wards, tutors, psychologists, in the outpatient department, in the corridors of residential departments, at posts, in the rooms supervising the work of prisoners - kitchen, workshops, warehouses, etc., also robotic pilots among departmental, tutors, psychologists, officers providing and implementing walks, visions;)
   - burglary (mainly perimeter protection, implemented by means of motion detectors, infrared barriers, microwaves, laser detectors, glass break detectors, vibrating detectors, smoke detectors, etc., but also rooms such as armament warehouses, secret offices, server rooms, archives, warehouses, entrances / exits from residential pavilions e.g. emergency exits, hatches or roof, basement windows, etc.).

2. The Access Control System (SKD) is implemented on the basis of proximity access cards and access privileges granted to these cards to specific people to specific places. The access card is treated as a key. It may allow the opening of doors and entrance grilles for residential buildings and departments, as well as doors and transition grilles in passageways only to the extent necessary for the performance of official duties performed by its user. To the implemented access control systems, the Prison Service has introduced modern electronic
chips to the company ID card, which are also a cryptographic card containing database access keys and an electronic signature. Cards are issued by the Central Certification Point in the Central Board of the Prison Service. The basis for opening the cell door is still mechanical keys. Locks, electromagnetic locks, electric strikes, electromechanical locks are executive elements in Access Control systems. The quality of these devices and the right selection for the functions carried out guarantees their efficient functioning. As experience of individuals shows, they are one of the most important elements affecting the movement of people and their safety in a penitentiary unit. As part of secure access control to rooms and zones, biometric identification and access systems are increasingly used in penitentiary units. The purpose of the biometric facility security control system is to allow access to specific places for specific people identified through biometric features. It is possible, among others through the use of biometric readers (more accurate identification of persons, linking other existing identifiers with their owner). Biometry allows for precise identification of people by using their unique characteristic features, which include fingerprint characteristics, hand geometry, face, ear, mouth geometry, iris structure, finger, hand or wrist vein system, and voice color (Bolle, Connell, Pankanti, Senior, 2003). As practice shows, biometric identification is more reliable than traditional methods to ensure security such as passwords or PIN access codes. Biometric readers are currently used in many areas of security. They have been used in access control systems since the seventies of the last century. Initially (due to high costs) biometric readers were installed only in protected facilities, such as nuclear power plants, military facilities, facilities of strategic importance (Holyst, 2018). The rapid development of microprocessor technologies has made the availability of biometric systems more and more common, and their precision and reliability have increased significantly. As a result, they were used in many security systems intended for special security facilities, which are undoubtedly prisons and detention centers (Holyst, Pomykala, 2010).

3. Video monitoring system (CCTV). When it comes to saturation of penitentiary units with video surveillance cameras, statistically per unit is about 83 cameras. It is important when organizing the operator/observer position to create appropriate, ergonomic working conditions to achieve the expected effectiveness of observation. In some places, mounting cameras is optional when it comes to observations of the unit’s area or selected rooms of art. 73 sq m There are also places on the premises of the unit where the installation of cameras is obligatory and this applies especially to convicts who pose a serious social threat or a serious threat to the security of the plant or it was decided to carry out self-examination against them, this applies especially to those detained on remand (Article 212c of the Penal Code). In addition, by decision of the director of the unit, the camera can be installed in a residential cell and obligatorily in a security cell. The rule is that they should be cameras resistant to mechanical damage caused by prisoners and enabling surveillance also at night in the absence of lighting. Monitoring used in penitentiary units must guarantee uninterrupted, continuous operation.

4. Fire signaling system (SSP) Due to the specificity of prison facilities, certain penalties in the use of fire regulations are applied in penitentiary units. Fire alarm systems are usually installed indoors, not in entire buildings. These special rooms are: weaponry warehouse, handy weaponry warehouse, offices and archives. Due to the 24-hour supervision of physical protection, environmental conditions, behavior of prisoners who often devastate equipment, smoke cigarettes, the use of residential fire alarm systems in pavilions does not meet expectations.

A large number of cameras installed and other elements of the alarm systems, forces the installation of systems supporting the work of the operator-observer. For example, through integration or the ability to switch projected images through motion detection, intelligent image analysis. Intercoms are used to establish fast, remote communication. Intercoms, there are three solutions installed in prisons for communication between:

- prisoners in residential cells, common rooms and a departmental officer,
- prisoners and a person in a “contactless vision”, i.e. seeing in a way that prevents direct contact with the visitor,
- a person at the crossings in the unit and the operator’s position.

These are independent systems that should meet certain requirements: intercoms must be resistant to mechanical damage by prisoners. Video intercoms and intercoms are used at the entrances and entry gates to the unit.
A separate group of devices used to ensure the security of penitentiary units are devices for controlling people and rooms, as well as detectors detecting prohibited items.

Security officers of the Prison Service use various types of control equipment. In addition to electronic devices, properly trained dogs are also used for control. An officer equipped with mechanical or electronic devices is obliged to use them for personal or cursory control of prisoners, persons from freedom, cells and other rooms, packages and objects as well as vehicles entering the penitentiary unit. Gate metal detectors - used at the entrances to units, and very often used manual metal detectors equipped with security officers. They are used to control people, parcels, correspondence, cells and rooms (things owned by prisoners). These devices are most often used in the daily work of officers.

Drug and explosive detectors used to detect drugs (in packages, correspondence, on the premises, indoors, for residential purposes, as well as by people entering the penitentiary unit) also use specially trained dogs to detect drugs. Chemical testers are used to recognize substances or ingestion of psychoactive substances. X-ray scanners are used to scan parcels that can be received by prisoners, correspondence to prisoners and SW units, as well as luggage, bags of persons applying for or leaving the premises of the unit. They are in all closed type prisons and detention centers. Scanners are also used to scan people, vehicles entering / entering the premises of the unit and outgoing / leaving. Cell phone detectors and devices interfering with the frequency of waves at which devices using mobile telephony operate.

3. Summary

Officers of the Prison Service and employees of the penitentiary unit use various wired and wireless communication systems as part of internal communication and to ensure security. All penitentiary units in Poland have online access to the Central Database of Persons Deprived of Freedom. Noe.NET is a system of records of persons staying in penitentiary units (convicted, detained and on remand). Access to the system is allowed only from the internal network, the user is equipped with an electronic certificate card issued by the Certification Point of the Central Board of Prison Service.

Other services, courts, have access to the dedicated database resource. The Noe.NET database has been classified as particularly important for national security. Electronic surveillance system (SDE) - The Prison Service is the administrator of the electronic surveillance system. This is the aforementioned prison system outside prison. The system is based on a transmitter on a hand or leg in a bracelet and a module for contact with the supervisory center installed in the convict’s place of residence. This module communicates with the monitoring central in the GSM network. A schedule is programmed in the control panel when the supervised person should stay at home and when outside. Rules are established for contacting, alerting and responding when a schedule is violated (Macwaldowski, 2014).

The most difficult tasks in terms of protection and to ensure security are performed by the Intervention Groups of the Prison Service (GISW). They are to prevent extraordinary accidents, intervene during prisoner revolts and collective instances. Their existence is primarily psychological and preventive. GISW were established on the basis of an ordinance on the principles of organization and scope of activity of full-time Prison Service Intervention Groups, signed on March 31, 2010 by the Director General of the Prison Service (Kochański, 2010).

Individual provisions of the ordinance specify in detail the scope of the prison intervention group, the type of equipment, uniforms, as well as matters related to its training. Each group, consisting of 16 officers, is appointed by the SW district director and, as a superior, commissions various tasks. Group members are at the disposal of the district director 24 hours a day. The district director is obliged to provide officers of the subordinate intervention group with training and training base. As the name suggests, this is a group for intervention, not for supervision over prisoners. The main argument in favor of the creation of GISW is a change in the approach to protective activities with an emphasis on internal protection. It is about the implementation of preventive measures, e.g. conducting more frequent ad hoc inspections of facilities and prisoners, securing departmental work, control of technical and protective security, implementation of convoys of convicts requiring increased protec-
tive measures (e.g. crown witnesses or so-called dangerous prisoners). Members of the intervention group are used to secure the individual in a natural disaster situation, e.g. by organizing and evacuating prisoners to other prisons and detention centers.

In addition, in situations of the highest threat, e.g. active rebellion, where the forces of a given unit are no longer sufficient, intervention actions of specialized groups, which are undoubtedly GISW, significantly contribute to increasing the security of penitentiary units. SW intervention groups also carry out many additional tasks. They carry out, among others: implementation of convoys of particularly dangerous prisoners, transport of particularly dangerous prisoners to other units, transport to courts, transport to hospitals, transport of prisoners requiring increased protection measures, control of cells and rooms in units, prevention of extraordinary events or liquidation of their effects, training other officers in the field of intervention techniques. In addition, officers of the intervention groups of the Prison Service actively cooperate with officers of other formations gaining new practical and theoretical experience. These include: terrorist subunits of other uniformed formations, as well as the Police, Border Guard, Military Police, Customs Service and others (Prison Service), which further strengthens the sense of personal security in penitentiary units.

References


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THE INTERACTION BETWEEN THE HUMAN RESOURCES MOTIVATION AND THE COMMITMENT TO THE ORGANIZATION

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Abstract. Achieving positive production and economic results in the businesses is no longer a product of the efforts of an organic circle of people, but a result of the activity of the members of the entire organization. Thus, the issue of employee motivation and commitment to the business entity becomes one of the basic prerequisites for the organizational efficiency and success. The lack of motivation and attachment to the goals of the company lead to increased staff turnover and reduced efficiency. This makes the investment of training, qualification and professional development of the human resources meaningless. The aforementioned necessitates the study and analysis of the main factors, which determine the people’s behavior at work, their motivation and involvement in the business entity. The purpose of this research is to investigate the relationship between the motivation of human resources and their commitment to the business organization. Establishing the interaction between the different determinants is essential in practical terms, as it allows one to predict the appearance of a certain attitude or behavior in the presence of the others.

Keywords: motivation; commitment; human resources; business organization, social responsibility, organizational effectiveness, communication, agreement

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JEL Classifications: J24, J21, D23, E24

1. Introduction

The socio-economic changes in Bulgaria in recent years have had a significant impact on the status and development of the business entities. This also influenced the manner of performance of the tasks, the role of the participants in its implementation, their expectations, values and skills. The managers faced challenges requiring new solutions. A reconsideration of values related to the individuals’ behavior at work, their satisfaction and sense of empathy, have proven to be crucial for the success of the management team and the viability of the company as a whole. They also contribute to its innovation and gaining a competitive advantage on the market (Pukala & Petrova, 2019; Aktan et al., 2018).
The scientific achievements, which explore the issue of employee motivation and commitment to the business entity, show significant results in the comprehension and structuring of this subject (Petrova et al, 2018; Islamgaleev, 2019; Zahars & Stivriņieks, 2018; Koval et al., 2019; Tumalavičius et al., 2017; Bernardi, 2019; Borisov et al., 2018; Lorincová et al., 2019; Hermawan, Gunardi, 2019).

Modifications in the content of work, in employees and in organizations have also necessitated a change in traditional human resource management models. They relate mainly to the integration of the members of the organization to make maximum efforts to achieve the common organizational goals. Achieving positive production and economic results in the businesses is no longer a product of the efforts of an organic circle of people, but a result of the activity of the members of the entire organization.

Thus, the issue of employee motivation and commitment to the business entity becomes one of the basic prerequisites for the organizational efficiency and success. The lack of motivation and attachment to the goals of the company lead to increased staff turnover and reduced efficiency. This makes the investment of training, qualification and professional development of the human resources meaningless. The aforementioned necessitates the study and analysis of the main factors which determine the people’s behavior at work, their motivation and involvement in the business entity.

Bulgarian and foreign researchers (Gryshova et al, 2019; Labunska et al., 2017; Islamgaleev, 2018a; Islamgaleyev, 2018b; Odinokova et al., 2018; Gryshova et al, 2016a; Gryshova et al, 2016b; Hlushko et al, 2015) noted that in the innovation economy, the efficiency evaluation based on multiple criteria is a more complicated option, but on the other hand, this evaluation gives more insight into the real state. In this sense, the guarantee of the sustainability and development of the business organizations is only possible by building an effective system of selection of the management personnel. In the context of the systematic approach, it is of paramount importance to develop a model for selecting a management team to ensure the sustainability and development of the business organizations.

The problems of social partnership were considered by many specialists (Lazarova et al, 2015; Petrova et al, 2018; Androniceanu & Tvaronavičienė, 2019). Promotion of economic educational services in Bulgaria were considered by Odinokova et al (2018), Vazov (2019).

Cooperation of entrepreneurs with institutions of vocational and higher education is viewed as close interaction between the educational and the private sectors (Uteubayev et al, 2018; Islamgaleyev & Uruzbayeva, 2018; Girdzijauskaite et al., 2019).

Knowledge transfer between universities and business will work best where there is a general framework of cooperation and mutual understanding, involving partnerships, joint projects and the exchange of people, respectively using social environment aspects (Zemlickiene et al. 2017; Tvaronavičienė, Razminičienė 2017; Bubliénė et al, 2019).

The effective management is a guarantee of lasting and competitive advantage. It is implemented in accordance with the targets and strategies of the organization, through the performance of a number of management functions and tasks related to planning, selection, evaluation, adaptation, informing, organization, leadership and motivation.

The motivation is key to understanding human behavior at work and is a prerequisite for efficiency in the job. It is influenced by a number of reasons, both personal and organizational. However, motivation often is narrowed down only to the needs of the individual or is considered only through the aspect of financial rewards and incentives, without regarding it as a complex phenomenon which involves many aspects. To gain a fuller understanding, on the basis of which appropriate systems for motivation and retention of qualified personnel can be introduced, it is necessary to analyze each of these components, taking into account the interaction between them, as well as their influence on motivation (Ilieva, 2009).
The issue, related to the necessity of research and increase of the motivation for the work of human resources, is becoming extremely relevant and important for the effective and successful functioning of the business organizations today. Despite the indisputable importance of motivation at work, despite the recognition of the importance and the role of the organizational structures responsible for the social, economic and spiritual commitment of the human resources to the companies, the problem of research and increase of their cooperation remains poorly understood, especially nationally (Davidkov, 2009). In the past ten years, Bulgaria has almost lacked research and publications to examine and study the motivation of the human resources and their involvement in the business entity.

The purpose of this study is to investigate the relationship between the motivation of the human resources and their commitment to the company. Establishing the degree of interaction between the individual determinants is essential in practical terms, as it allows one to predict the occurrence of an attitude or behavior, at the presence of other. From this perspective, this study presents an alternative view on the relationship between motivation and commitment of the human resources, ensuring organizational effectiveness and success.

2. Material and method

In order to study the interaction between the motivation of the human resources and their commitment to the business, 108 individuals were interviewed from seven different in size, status and type of ownership business entities in Bulgaria:

1. P2P ЕООД - Sofia
3. GT Fast Trans ООД - Petrich
4. А&Т ООД – Burgas
5. Capsico ООД - Parvomay
6. LDJ – Nikolay Markov ET – Sofia
7. Gabi – Aleksandar Marinov ET – Sofia

According to their size, the surveyed business organizations are grouped into three groups, and namely:

- Up to 10 employees - 57.14%
- From 11 to 50 employees - 28.58%
- Over 51 employees - 14.28%

By economic sectors, the companies are allocated as follows: 14.28% of the Industry sector (Clothing Manufacturing), 57.14% of the Services sector (hotel, restaurant and commerce) and 28.58% of the Agricultural sector (grain and vegetable production).

According to their legal structure, the business entities are grouped into three groups: The first one includes enterprises as Sole Traders (28.58%). These are mostly small companies where the bulk of the production is intended for the local markets. The second and third groups are capital companies. These are Single-Member Limited Liability Companies (28.58%) and Limited Liability Companies (42.84%). In these legal and organizational structures, the basic factors for achieving good economic results are vocational education, qualification and production experience.

The sample covers 89% of the employees in the companies, which enables us to recognize it as being representative. The main characteristics of the survey participants are presented in Figure 1.
The study is based on a previously developed questionnaire. It presents various statements describing the motivation of the human resources as well as their commitment to the organization in which they work. The participants were asked to rate different statements using a scale of 1 to 10. /The lowest score was 1 and the highest was 10/.

The work motivation was measured by various statements organized into 10 groups. They present the main aspects of motivation, and namely:

- Motivation for work related to the working conditions - expressed by statements such as “The physical conditions at my workplace are good” and “My working hours are convenient for me and my family”;  
- Motivation for work related to remuneration and wages - expressed through statements such as “The income I receive provides me with a good standard of living”;  
- Work motivation related to the content of the tasks - expressed through statements such as “My work is interesting and fascinating”, “My job requires me to use the skills and abilities I have”, or “My work is strenuous”;  
- Motivation for work related to self-control - expressed through statements such as “I can independently determine the way and the sequence of my tasks”;  
- Feedback motivation for work - expressed through statements such as “I can always judge whether the results I have achieved are good”;  
- Work motivation related to the organization’s policy towards its employees - expressed through statements such as “There is good work organization in my workplace”, “The company provides me with the use of additional benefits and perks”;  
- Motivation for work related to the professional and personal development - expressed through statements such as “I have the opportunity to be promoted and to advance in my job”;  
- Motivation for work related to recognition - expressed through statements such as “I am adequately valued and recognized by the management”;  
- Motivation for work related to the colleagues - expressed through statements such as “the relationship between our team members is good”;  
- Motivation for work related to the managers - expressed by statements such as “My boss is a competent specialist” or “I have a decent and sympathetic boss”.

The main aspects revealing the the human resources involvement in the business organizations are directed to:
- the content of the work,
- the surrounding conditions,
• the relations with the management team,
• the remuneration,
• the relationships with the colleagues,
• the overall satisfaction.

They are expressed through statements related to the possibility of autonomy and control, the responsibility at performance, the ability to use the skills in the work process, the tension at the job and the variety in carrying out the work tasks.

At the analysis of the links between the commitment and the various aspects of the work activities, related to motivation, a factor analysis was also made using the principal components of Varimax rotation. The initial theoretical assumptions are based on the notion that commitment to an organization is a complex psychological entity which is formed under the influence of various factors and therefore has various forms of manifestation of personality behavior at the workplace. As a result, five main factors have been identified which cover the various components of human resource engagement with the business organization.

The first factor involves statements whose content allows us to derive it as a „value of membership“. This factor emphasizes the desire of the individual to be a member of that precise organization due to emotional and moral reasons.

The second factor contains statements related mainly to feelings and emotions leading to different degrees of empathy. For the purposes of the study, it is referred to as „emotional affiliation“.

The content of the third factor reflects the intention to leave or stay in the current organization and the alternatives available to choose among (e.g., „I think my options are too limited to think of leaving that company“; „Many things in my life would go wrong if I decided I wanted to leave right now. „) It is referred to as „lack of alternative for leaving“.

The fourth factor covers statements about the value of staying in the organization as a result of the socialization process which leads to the conviction of loyalty and faithfulness to the company. This strong moral expression also gives the name of the factor - „loyalty to the organization“.

The last of the separate factors is related to the possible losses (material and psychological) of leaving the organization („It would be very difficult for me to leave this company, even if I wanted to“). Therefore, the name of this factor is „personal sacrifice from leaving the organization“.

Limitations. The research is based on primary survey data from seven companies in five towns in Bulgaria. From this perspective, some of the data may not overlap completely with other organizations in different cities. This is due to the heterogeneous socio-economic conditions in the different regions of Bulgaria, as well as due to a number of other objective and subjective factors.

The survey covers the period September 2018 - February 2019. It is based on a questionnaire specifically designed for the purpose of the study. The interview method is used to clarify the data and information. The statistical data processing is performed through the method of Pearson correlation analysis. The statistical package SPSS 13.0 and Microsoft Office (Word, Excel, Power Point) are used for data processing and analysis.

3. Results and discussion

Study of the interaction between the motivation of the human resources and their commitment to the organization
The data from the study of the interaction between the motivation of the human resources and their involvement in the company show that the first considered aspect of human resources commitment in the business organizations, arising from the content of work, is a statistically significant correlation with all aspects of motivation considered (Table 1). Particularly high correlation coefficients are observed, respectively, with the opportunity for professional and personal development /R = 0.583/, recognition /R = 0.668/, work content /R = 0.648/ and self-control /R = 0.569/. Their significance is proved at α = 0.01. This shows that the more conditions for professional development and self-improvement are created in the organizations, the more the individual is inclined to develop empathy with the conditions offered by the respective organization.

**Table 1. Interaction between commitment and the different aspects of work related to motivation**

<table>
<thead>
<tr>
<th>Commitment Motivation</th>
<th>Content of Work</th>
<th>Working Environment Conditions</th>
<th>Relations with the Management Team</th>
<th>Remuneration of Work</th>
<th>Relations with Colleagues</th>
<th>Overall Satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working Conditions</td>
<td>0.406**</td>
<td>0.507**</td>
<td>0.198</td>
<td>0.303*</td>
<td>0.106</td>
<td>0.143</td>
</tr>
<tr>
<td>Remuneration</td>
<td>0.431**</td>
<td>0.678**</td>
<td>0.347**</td>
<td>0.736**</td>
<td>0.167</td>
<td>0.175</td>
</tr>
<tr>
<td>Work Content</td>
<td>0.648**</td>
<td>0.395**</td>
<td>0.469**</td>
<td>0.326**</td>
<td>0.221</td>
<td>0.384**</td>
</tr>
<tr>
<td>Self-Control</td>
<td>0.559**</td>
<td>0.594**</td>
<td>0.503**</td>
<td>0.284*</td>
<td>0.209</td>
<td>0.288*</td>
</tr>
<tr>
<td>Feedback</td>
<td>0.154</td>
<td>0.209</td>
<td>0.173</td>
<td>0.169</td>
<td>0.136</td>
<td>0.203</td>
</tr>
<tr>
<td>Organization Policies</td>
<td>0.397**</td>
<td>0.467**</td>
<td>0.237*</td>
<td>0.323**</td>
<td>0.183</td>
<td>0.188</td>
</tr>
<tr>
<td>Opportunities for Professional and Personal Development</td>
<td>0.583**</td>
<td>0.621**</td>
<td>0.534**</td>
<td>0.594**</td>
<td>0.166</td>
<td>0.347**</td>
</tr>
<tr>
<td>Recognition</td>
<td>0.668**</td>
<td>0.603**</td>
<td>0.559**</td>
<td>0.511**</td>
<td>0.244*</td>
<td>0.361**</td>
</tr>
<tr>
<td>Relationship with the Colleagues</td>
<td>0.386**</td>
<td>0.326**</td>
<td>0.426**</td>
<td>0.257*</td>
<td>0.148</td>
<td>0.246*</td>
</tr>
<tr>
<td>Relationship with the Management</td>
<td>0.434**</td>
<td>0.515**</td>
<td>0.701**</td>
<td>0.258*</td>
<td>0.317**</td>
<td>0.358**</td>
</tr>
</tbody>
</table>

*Source: Author's data,*

*Note:* *The correlation is proven at 0.05 levels; ** The correlation is proven at 0.01 levels

Similar results are also observed in the interrelationship of the human resource commitment, resulting from the surrounding conditions, and the work motivation. In order to be achieved high organizational efficiency and development of the business organizations, a satisfactory payment of the invested labor is required /R = 0.678 at α = 0.01/; creating conditions for professional and personal development /R = 0.621 at α = 0.01/; recognition /R = 0.603 at α = 0.01/ and self-control /R = 0.594 at α = 0.01/. This implies creating a work environment which provides freedom, flexibility, autonomy and responsibility. All of the above listed leads to increased organizational efficiency and success.

Usually the relationships of the employees with the management team are perceived as a good opportunity for evaluation and feedback regarding the work and the efforts put into it. The data from this research show that high correlation coefficients for almost all aspects of motivation are found in the relationship between human resources involvement resulting from the relationships with the management and the work motivation. Particularly strong proportional dependence is observed in professional and personal development opportunities with R = 0.534 at α = 0.01 and recognition with R = 0.559 at α = 0.01. The interviewed associate these two aspects of motivation with the management team, which requires excellent communication between the different levels in the business organizations, as well as clear regulation of the opportunities for professional and personal development.

An important aspect of revealing the involvement of the human resources in the surveyed business organizations and its interaction with work motivation is the remuneration (material benefits). Good pay also requires a job well done. It is a recognition of the work done and the results achieved. This study finds a statistically proven relationship between remuneration and all aspects of the motivation. Particularly high correlation coefficients are reported at the development opportunities /R = 0.594 at α = 0.01/ and recognition /R = 0.511 at α = 0.01/. The satisfactory payment is directly linked to the professional and personal development opportunities and is an acknowledgment of excellent work. This reinforces the empathy of the human resources with the problems and development of the company.
When analyzing the relationship between the human resources involvement resulting from the relationships with colleagues and the work motivation, no statistically proven correlation coefficients are considered. The aspects related to the relations with the management team and the recognition are exceptions. They demonstrate statistically proven but low correlation coefficients.

Of interest are the results of the analysis of the last considered aspect of the human resources commitment resulting from the overall satisfaction. It does not exhibit statistically proven correlation coefficients in terms of payment and working conditions, as well as with regard to the organization’s policy and the feedback. The overall satisfaction is directly correlated with the content of work with \( R = 0.384 \) at \( \alpha = 0.01 \), the development opportunities with \( R = 0.347 \) at \( \alpha = 0.01 \), the recognition with \( R = 0.361 \) at \( \alpha = 0.01 \) and relations with the management team with \( R = 0.358 \) at \( \alpha = 0.01 \). From the data we can judge that the employees of the business organizations feel satisfied in an environment which offers them the opportunity for professional and personal development and which brings them well-deserved recognition. This is a guarantee for achieving high levels of organizational efficiency and success.

**Analysis of the factors of the interaction between the different aspects of empathy and the different aspects of work related to motivation**

Interesting results are also observed in the factor analysis (Table 2). The study of the first factor shows a strong interaction of the value of membership with the motivating factor “working conditions”/\( R = 0.561 \) at \( \alpha = 0.01 \). The more valued an organization’s membership is, the more the environment is perceived to be favorable in terms of the opportunities it offers for promotion and growth, thus achieving organizational effectiveness and success. A statistically significant correlation is also observed in the content of work /\( R = 0.425 \) at \( \alpha = 0.01 \/) and recognition /\( R = 0.373 \) at \( \alpha = 0.01 \/). The content of the work greatly enhances the value of membership. Perceiving the job as the enabler of autonomy, control, feedback, and utilization of abilities and skills, guarantees an increased desire to be and remain a member of an company. Statistically proven but low correlation coefficients are also observed in opportunities for development, relations with management and payment.

The emotional affiliation is largely related to almost all aspects of the motivation, with correlations here having similar values to those of the value of membership. The sense of emotional attachment to the organization greatly enhances the motivating force of the opportunity for professional and personal growth /\( R = 0.455 \) at \( \alpha = 0.01 \/) , recognition /\( R = 0.457 \) at \( \alpha = 0.01 \/) and the content of work /\( R = 0.489 \) at \( \alpha = 0.01 \/). The more the employees are motivated by the various aspects of the environment, the more they perceive the organization as a large family of which they are a part. Remuneration motivation is also significantly associated with experiencing emotional attachment to the organization - \( R = 0.466 \) at \( \alpha = 0.01 \).

**Table 2. Factor analysis of the commitment and the different aspects of the work related to motivation**

<table>
<thead>
<tr>
<th>Commitment Factors</th>
<th>Value of Membership</th>
<th>Emotional Affiliation</th>
<th>Lack of Alternatives for Leaving</th>
<th>Loyalty to the Organization</th>
<th>Personal Sacrifice from Leaving the Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working Conditions</td>
<td>0.561**</td>
<td>0.532**</td>
<td>0.407**</td>
<td>0.418**</td>
<td>0.261</td>
</tr>
<tr>
<td>Remuneration</td>
<td>0.319*</td>
<td>0.466**</td>
<td>0.324*</td>
<td>0.189</td>
<td>0.298*</td>
</tr>
<tr>
<td>Work Content</td>
<td>0.425**</td>
<td>0.489**</td>
<td>0.365*</td>
<td>0.263</td>
<td>0.358*</td>
</tr>
<tr>
<td>Self-Control</td>
<td>0.268</td>
<td>0.198</td>
<td>0.174</td>
<td>0.197</td>
<td>0.223</td>
</tr>
<tr>
<td>Feedback</td>
<td>0.186</td>
<td>0.207</td>
<td>0.118</td>
<td>0.264</td>
<td>0.187</td>
</tr>
<tr>
<td>Organization Policies</td>
<td>0.203</td>
<td>0.163</td>
<td>0.423**</td>
<td>0.489**</td>
<td>0.164</td>
</tr>
<tr>
<td>Opportunities for Professional and Personal Development</td>
<td>0.271*</td>
<td>0.455**</td>
<td>0.248</td>
<td>0.437**</td>
<td>0.253</td>
</tr>
<tr>
<td>Recognition</td>
<td>0.373**</td>
<td>0.457**</td>
<td>0.468**</td>
<td>0.368*</td>
<td>0.539**</td>
</tr>
<tr>
<td>Relationship with the Colleagues</td>
<td>0.328*</td>
<td>0.409**</td>
<td>0.266</td>
<td>0.483**</td>
<td>0.411**</td>
</tr>
<tr>
<td>Relationship with the Management</td>
<td>0.352*</td>
<td>0.194</td>
<td>0.368*</td>
<td>0.501**</td>
<td>0.224</td>
</tr>
</tbody>
</table>

Source: Author’s data, 
Note: * The correlation is proven at 0.05 levels; ** The correlation is proven at 0.01 levels
The lack of an alternative for leaving interacts particularly strongly with the working conditions with $R = 407$, recognition $R = 468$, and the company policy $R = 423$. Their significance is proven at $\alpha = 0.01$. Any organization which seeks to create a work environment which offers freedom, flexibility, autonomy and responsibility, gives its employees a reason to all the more appreciate the lack of alternatives.

Loyalty is primarily related to the motivating force of the working conditions $/R = 418$ at $\alpha = 0.01/$, the policy of the organization $/R = 489$ at $\alpha = 0.01/$, the relations with colleagues $/R = 483$ at $\alpha = 0.01/$ and the management $/R = 501$ at $\alpha = 0.01/$, which shows that the influence of the external aspects of labor dominates. Contrary to the expectations, it turns out that high loyalty is maintained mainly by favorable social (satisfaction with management and colleagues) and organizational (opportunity for promotion, recognition and growth, physical working conditions) factors. Loyalty does not prove the interaction with salary, job content or feedback. From all this we can conclude that the factors of loyalty formation are not material but rather social and are directly related to the employees' sense of acceptance.

The personal sacrifice from leaving the organization factor interacts particularly strongly with the recognition and relationships with colleagues. They show a proportional interdependence, proven by $R = 539$ and $R = 411$ at $\alpha = 0.01$, respectively. The satisfaction with the job content $/R = 358$ at $\alpha = 0.05/$ and remuneration $/R = 298$ at $\alpha = 0.05/$ are equally related to the personal sacrifice of leaving. On the one hand, they increase the feeling of the individuals that they will lose something valuable on leaving. On the other hand, there remains the dissatisfaction with pay and the opportunities for promotion and growth. This reduces the sense of sacrifice which the individuals would experience upon leaving the organization, and this greatly facilitates their intentions to leave.

Conclusions

As a result of the data presented and the analysis made about the relationship between the motivation of the human resources and their commitment to the business organization, the following important conclusions can be drawn:

- The more the conditions for professional development and self-improvement of the human resources are enhanced in the business organizations, the more the person is inclined to develop a commitment to the conditions offered by the respective organization, which guarantees the achievement of organizational efficiency and success;
- The achievement of high organizational efficiency and development of the companies requires the creation of a working environment which provides freedom, flexibility, decision-making capacity and responsibility;
- The relationships of the employees with the management team are perceived as a good opportunity to evaluate the human resources and a feedback regarding the work and the efforts put into it;
- Good remuneration is directly linked to professional and personal development opportunities and is an acknowledgment of excellent work. This strengthens the human resources involvement in the problems and the development of the business entities;

The employees of a company feel satisfied in an environment which offers them the opportunity for professional and personal development that brings them well-deserved recognition, which is a guarantee for achieving organizational efficiency and success.

Good conditions and satisfaction with the work performed is the success of the entire enterprise. It favors dynamic development and stimulates innovation (Pukala, 2016, Pukala, 2019). So it is a source of organization’s success.

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STATE REGULATION OF TARIFFS IN THE GAS SECTOR

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Abstract. The article discusses the problems of state regulation of tariffs for gas transportation services through gas distribution networks, which minimize losses and the need to create reasonable verifiable principles for establishing tariffs. The absence in the spheres of natural monopolies of effective competitive mechanisms poses a challenge for the state to create a special system for regulating their activities, which includes legal and organizational components. In each industry where natural monopolies operate, there are some pricing features that are reflected in the legal regulation. This article focuses on the structure of contractual relations in the field of gas supply during the transportation and sale of gas, which allows you to clearly demonstrate the reflection of the regulatory framework reflecting the state’s requirements to keep a separate record of products (services) and costs of its production by an organization engaged in the extraction, transportation and sale of natural gas.

Keywords: state regulation, tariffs; antimonopoly regulation; gas supply


JEL Classifications: O33; O38; J21
Additional disciplines management, ecology and environment; energetics

1. Introduction

Tariff regulation is actively developing in Russia. One of the areas of activity of the Federal Antimonopoly Service of the Russian Federation (FAS Russia) is the establishment of state prices and tariffs for a particular type of product or service that is provided by natural monopolies. Natural gas occupies a dominant position among energy sources in Russia (Paptsov et al., 2019; Voronkova et al., 2019; Fedulova et al., 2019; Shakhovskaya et al., 2018) therefore, particularities of state regulation of gas supply activities require special attention. As natural-monopoly and state-regulated types of activity, the transportation of gas through gas pipelines and distribution networks is singled out in regulatory legal acts (Luzina et al., 2019; Frolova et al., 2019; Saenko et al., 2019). When regulating gas pricing, insufficient attention is paid to the problems of operating networks and improving safety in order to minimize losses (Masood et al., 2019). The disclosure of the reserves of the organizational and economic mechanism of state regulation of tariffs for gas transportation services through gas distribution networks is an important task (Korableva et al., 2019).

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2. Methods

In the earth’s crust, gas is in a gaseous state as separate deposits or as a “gas cap” above the underlying oil, as well as in a dissolved state in the same oil or water.

Gas supply - the organized supply and distribution of gas fuel for the needs of the national economy. Natural gas is the most environmentally friendly fuel, while the cost of its production and transportation is quite low. These features make it the most perfect and economical type of fuel. That is why a developed and sustainable gas supply is a priority, not only in our country.

The largest consumers of natural gas are thermal power plants (thermal power plants) and enterprises of various industries (mechanical engineering, ferrous and non-ferrous metallurgy, building materials industry, etc.). There are various ways of organizing gas supply. The selection of a suitable method depends on the region and on the development of a gas transportation system in it.

Gas is supplied by natural and artificial gases through gas pipelines transporting gas from the places of its production or production to consumers. Gas is received by a settlement or an industrial facility at a control and distribution point, where gas is reduced to a pressure allowed by the norms and enters the city gas network or an industrial enterprise (see Figure 1).

Transportation of liquefied gases. Widespread gas transportation by sea. At elevated pressure, natural gas is cooled and pumped onto gas tankers. Terminals for liquefying it are located on the sea coasts, where gas is delivered as already described, through pipelines. This transportation option allows you to provide natural gas to countries and regions where it is absent. Unloading is carried out in special storage, from which gas is then delivered to consumers through pipelines (Methodological recommendations).

Another common way to organize gas supply is autonomous gasification. In this method, propane gas obtained as an accompanying product is used, mixed in various proportions with butane. Such gas mixtures are the most high-calorie, unlike natural methane, and their combustion gives 2-3 times more heat. Such a gas is called somewhat more expensive than ordinary natural gas, but due to the gain in caloric value, its use has also been recognized as economically feasible. Gas supply in the form of autonomous systems is used in areas that do not have an extensive gas transmission network (Milojević, 2017; Prodanova et al., 2019; Akulshin et al., 2017; Trofimova et al., 2019).
Currently, in Russia, regulatory and legal regulation in the field of gas supply is actively developing. To understand the current state of the regulatory framework, it is necessary to highlight the documents regulating the activities of organizations in the field of gas supply.


The state regulation of gas prices and tariffs for gas transportation services takes into account economically justified costs and profits, as well as the level of financial support for organizations that own gas supply systems to expand gas production, the network of gas pipelines and underground gas storages. Decree of the Government of the Russian Federation of October 13, 1999 N 1158 “On ensuring compliance with economically sound principles of pricing of products (services) of natural monopolies” also extends to this type of activity of natural monopoly entities.

Thus, the condition of economic feasibility, despite the fact that it is not singled out as a separate principle of state policy in the regulatory area under consideration, is also necessary to determine the legality of the tariff for gas transportation services.

The methodology and features of calculating tariffs (tariff rates) for gas transportation services through gas pipelines, the main methods, as well as the composition of tariffs are determined by the corresponding Methodology approved by Order of the Federal Tariff Service of Russia dated 15.12.2009 No. 411-e / 7 (as amended on 10.31.2014 ) “On the approval of the Guidelines for the regulation of tariffs for gas transportation services through gas distribution networks” (Registered in the Ministry of Justice of Russia on January 27, 2010 N 16076). Based on this regulatory act, state regulation of tariffs for gas transportation services through gas pipelines is carried out by establishing their fixed levels (Order of the Federal Tariff Service).

3. Results

- The basic principles of setting tariffs in the field of gas supply are enshrined in the regulatory field. From 01.01.2001, organizations engaged in the extraction, transportation and sale of natural gas are required to keep separate records of products (services) and costs of its production for the following activities:
- natural gas production;
- services for the transportation of natural gas through pipelines;
- storage of natural gas;
- services for the supply (sale) of natural gas.
The following shall be subject to state regulation in the territory of the Russian Federation:

1. Wholesale gas prices in cases.
2. Tariffs for gas transportation services through gas pipelines for independent organizations.
3. Tariffs for gas transportation services through gas distribution networks.
4. The size of the payment for the supply and marketing services provided to gas consumers by its suppliers (when regulating wholesale gas prices).
5. Retail prices for gas sold to the public.
6. The retail price of liquefied gas sold to the population for domestic purposes.
7. Special allowances to tariffs for gas transportation services through gas distribution networks designed to finance gasification programs.
8. Fee for technological connection of gas-powered equipment to gas distribution networks and (or) standardized tariff rates that determine its value.

The Federal Antimonopoly Service of the Russian Federation carries out state regulation of:

- wholesale gas prices;
- tariffs for gas transportation services through gas pipelines for independent organizations;
- tariffs for gas transportation services through gas pipelines owned by independent gas transportation organizations;
- tariffs for gas transportation services through gas distribution networks;
- the size of the payment for the supply and marketing services provided to gas consumers by its suppliers (when regulating wholesale gas prices).

Executive authorities of the constituent entities of the Russian Federation in the field of state regulation of tariffs state:

- retail gas prices;
- retail prices for liquefied gas
- payment for technological connection of gas-using equipment to gas distribution networks and (or) standardized tariff rates that determine its value.

Tariffs for gas transportation services through gas distribution networks are approved for a period of not less than 3 and not more than 5 years. Rates can be set with a calendar breakdown.

The initial data for the calculation of regulated prices (tariffs) by the method of economically justified expenses are:

- estimated volume of products (services) for the regulatory period, determined on the basis of the balance of gas production and sales in the Russian Federation approved in the established procedure;
- the estimated total revenue (for the regulatory period) required to compensate for the economically justified costs attributable to the cost of production (work, services), and to provide organizations engaged in regulated activities with the profit necessary for their self-financing, as well as the means to pay all taxes and other obligatory payments in accordance with the legislation of the Russian Federation.

When setting regulated prices (tariffs) for gas, the indexation method can be used. When applying the method of indexing, prices (tariffs) for gas are multiplied by the value of the index of changes in prices (tariffs), determined by the regulatory body, taking into account the average annual parameters for the change in wholesale gas prices established by the Government of the Russian Federation and the forecast inflation rate.

Gas producers in Russia create competitive conditions in the gas market. Companies such as Gazprom PJSC, Novatek PJSC, Northgas CJSC, Surgutneftegas PJSC, Itera Oil and Gas Company and others are engaged in the exploration, production, processing and sale of natural gas. Many gas producing companies have their own gas tankers for transporting liquefied gases.
Otherwise, the situation is when transporting natural gas through pipelines (De Moreira et al., 2019). The world’s largest gas transmission system is owned by PJSC Gazprom. The main part of this system is part of the Unified Gas Supply System (UGSS) of Russia. UGSS is a unique technological complex that includes gas production, processing, transportation, storage and distribution facilities in the European part of Russia and Western Siberia. Art. 14 of the Federal Law “On Gas Supply in the Russian Federation” regulates the indivisibility of the Unified Gas Supply System. Gazprom provides independent companies with non-discriminatory access to gas pipelines. In 2018, 24 companies provided gas transportation services through the Gazprom gas transmission system in the Russian Federation. The dynamics of access for 3 years is presented in table 1.

<table>
<thead>
<tr>
<th>Period</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of companies</td>
<td>22</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Volume of transportation, billion cubic meters m</td>
<td>121,5</td>
<td>129,0</td>
<td>137,9</td>
</tr>
</tbody>
</table>

Source: (PJSC Gazprom quarterly report)

In the period from 2002 to 2004, PJSC Gazprom reorganized the company structure by opening separate legal entities working in various areas in the oil and gas industry within the corporation. Consider subsidiaries that are controlled by PJSC Gazprom, which are of significant importance to it and built into an organized structure of contractual relations in the field of gas supply during gas transportation and sales (PJSC Gazprom quarterly report).

Sale of natural gas to all categories of consumers in the Russian Federation:
- Gazprom Mezhregiongaz LLC, location Russian Federation, St. Petersburg. Share of PJSC Gazprom in the authorized capital of the controlled organization: 100%.

Gas transportation.
- LLC Gazprom transgaz Volgograd;
- OOO Gazprom transgaz Nizhny Novgorod;
- Gazprom transgaz Makhachkala LLC;
- LLC Gazprom transgaz Stavropol;
- And others. The share of PJSC Gazprom in the authorized capital of these controlled organizations: 100%,
Type of control: direct control

Transportation of natural gas through gas distribution networks:
- LLC Gazprom gas distribution Volgograd
- PJSC Gazprom Gas Distribution Nizhny Novgorod
- JSC Gazprom Gas Distribution Makhachkala
- OOO Gazprom gas distribution Dagestan
- LLC Gazprom gas distribution Vladikavkaz
- And others

Figure 2 clearly demonstrates the interaction of organizations performing a strictly defined type of activity,
which allows them to keep separate records of products (services) and costs of its production.

Discussion

The volume of actually received gas and transferred to consumers by a regional supplier is determined by
metering devices at a gas distribution station (GDS). The volume of actually received gas by the consumer is
determined by metering devices installed on the territory of the consumer.

When transporting natural gas, irretrievable losses (volume reduction) of natural gas are generated due to the
technological features of the transportation process, as well as the physicochemical characteristics of the trans-
ported natural gas, i.e. technological losses (Kopteva et al., 2019; Botelho et al., 2019).

Do not apply to technological losses of natural gas:
- gas losses caused by the violation of regulatory legal and (or) regulatory and technical documents govern-
ing the operation of equipment, processes, structures;
- gas losses that occurred during emergency recovery operations;
- the amount of gas used during routine maintenance and repair work, as well as during testing at the main
gas pipeline facilities;
- the amount of gas used for own and (or) communal needs;
- gas losses resulting from accidents, theft of transported gas.

The Ministry of Energy of the Russian Federation (MinEnergo) has developed guidelines for determining the
 technological losses of natural gas during transportation by trunk pipelines. Based on this technique, the norm
of technological losses of natural gas during transportation by the main pipeline is calculated - the relative
value of technological losses in the calculation period to the amount of natural gas to be transported through
this section in accordance with the technological scheme of transportation approved in the established manner.
By Order No. 1206 of December 22, 2017, the Ministry of Energy approved the standards for technological
losses of combustible natural gas when transported by trunk pipelines by subsidiaries of PJSC Gazprom. Here
are some of the standards indicated in the document in table 2.

<table>
<thead>
<tr>
<th>Name of person</th>
<th>Norm,%</th>
</tr>
</thead>
<tbody>
<tr>
<td>LLC Gazprom transgaz Volgograd</td>
<td>0,004</td>
</tr>
<tr>
<td>LLC Gazprom transgaz Nizhny Novgorod</td>
<td>0,007</td>
</tr>
<tr>
<td>LLC Gazprom transgaz Stavropol</td>
<td>0,012</td>
</tr>
<tr>
<td>LLC Gazprom transgaz Makhachkala</td>
<td>0,013</td>
</tr>
<tr>
<td>LLC Gazprom transgaz Moscow</td>
<td>0,019</td>
</tr>
<tr>
<td>LLC Gazprom transgaz Saratov</td>
<td>0,030</td>
</tr>
</tbody>
</table>

Source: Methodological recommendations
The standards for natural gas losses during transportation by the main gas pipeline are monitored at the state level.

In turn, losses incurred in areas of gas distribution systems are located in the area of expenses of gas distribution organizations and the gas supplier (Islamov et al., 2019; Rogatchev et al., 2019). Federal Tariff Service in the Information Letter dated June 28, 2005 N SN-3923/9 provided clarifications on the issue of accounting for gas losses in order to resolve disagreements arising from settlements between suppliers, consumers of gas and gas distribution organizations providing gas transportation services. Responsibility for gas imbalance, according to the Federal Tariff Service of Russia, is distributed between the gas supplier and the gas distribution organization and is reflected in their financial result.

It should be noted that the size of technological losses taken into account when calculating the tariff cannot exceed 0.5% - 0.6% of the total volume of gas transportation.

Based on the fact that tariffs for gas transportation services are set mainly on the basis of reimbursement of economically justified costs, as a result, losses are returned in new tariffs to consumers.

Conclusions

An important role in the development of the regulatory framework is support from the Government of the Russian Federation, the Ministry of Energy of Russia, the FAS Russia. Work on the establishment of tariff regulation mechanisms is important for the economic sphere of control. It should be noted that focused and effective work on the creation of common principles of tariff regulation in all regulated areas of activity will serve as protection against various risks: legal, operational.

The organizational and economic mechanism of state regulation of tariffs for gas transportation services through gas distribution networks that minimize losses and create reasonable verifiable principles for establishing tariffs is a promising and important tool for the development of the industry as a whole.

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ANALYTICAL CAPABILITIES OF INTEGRATED CORPORATE REPORTING

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Abstract. The analysis of integrated corporate reporting relevance, the usefulness of disclosing financial and non-financial indicators, that are essential in the reporting to assess business performance and create a value chain, is the subject of study. The authors found that the leading indicators of economic activity of interest to external and internal users of the reporting information are related to the investment attractiveness of the company, its sustainable development, efficiency, and profitability. Therefore, to analyze value creation efficiency, it is necessary to expand the range of assessment with the following cost factors: organization, customers, society, natural environment, innovation, risks, and corporate management. should be classified into the following groups related to the company’s performance: income-generating (possibility of growth, competitiveness, cost of capital, risks) and expense-generating (labor costs, transaction losses, cost of capital, risk management). In this paper, the authors suggest a model for an objective assessment of the company’s ability to create added value, given the management segments (economic, environmental, social) and various forms of capital, which allows determining the company’s business advantages, directions for maximizing opportunities and minimizing risks for each capital used and reducing the information gap between financial and non-financial information, as well as improving business transparency.

Keywords: integrated corporate reporting; information; interested users; analytical capabilities; model

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JEL Classifications: M21, M40, G32

Additional disciplines Financial economics

1. Introduction

The complex, diverse, multidirectional institutional processes happening around the world have resulted in a fundamental change in ideas on how, to what extent, based on which methodological platform, should the information on the activities of the reporting entity be disclosed to the stakeholders. The answer is greatly determined by the fact that the traditional concept of capita today has undergone a significant transformation. The capital involved in the creation of added value, which the investors consider as the main guarantee of positive results and return on investment, today has acquired a complex, integrated character and can no longer be reduced to financial or material flows.
Consequently, the return on investment, the growth of business value, the development perspective are assessed not only in relation to the funding levels and the real availability of material assets but also by considering intangible components, such as economic relations, network interactions, the use of modern communication technologies, market segmentation, the active use of intellectual property, environmentally oriented business solutions, etc (Mullakhmetov et al., 2019).

Under these conditions, the accounting (financial) statement remains the essential foundation for making investment and financial decisions. It ceases to be the only source of information about the property status and financial capacity and can no longer satisfy the increased diversity of information requests from various users (Korableva et al., 2019).

The preparation of integrated corporate reporting is becoming a priority in the presentation of corporate information. It is increasingly regarded as a modern effective enterprise management tool providing the necessary information connectivity and completeness of the disclosed information on sustainable business development (Arbidane, Mietule, 2018; Subačienė et al., 2018; Vegera et al., 2018a; Vegera et al., 2018b; Ivanova et al., 2019; Stazić et al., 2019; Hijazi and Mahboub, 2019; Saenko et al., 2019; Miguélez et al., 2019; Voronkova et al., 2019; Nadhir, Wardhani, 2019; Puryaev, Puryaev, 2019).

The International Integrated Reporting Council describes it as “a comprehensive compact message to all interested parties about how the organization’s strategy, management, activities, and plans for the future, taking into account the external environment, lead to short, medium and long-term creation of additional value” (International Integrated Reporting Council (“the IIRC”), 2013). It is considered as a modern, actively used channel of information interaction to meet the interests of a wide range of stakeholders, including employers, customers, suppliers, business partners, local communities, regulatory institutions, and public authorities.

2. Literature review

The theory and practice of financial and non-financial reporting have been studied by numerous the following scientists. The problem of corporate social responsibility, environmental orientation and sustainable business development, including issues of non-financial information disclosure, were examined in numerous works (e.g. Energy Transformation towards Sustainability, 2020; Razminienė, Tvaronavičienė, 2018; Černevičiūtė et al., 2019 etc.)

The need for an effective and broad combination of heterogeneous information elements is indicated in the works of a famous Western scientist, one of the main ideologists of integrated reporting, R.J. Eccles (Eccles, 2010). He was one of the first to note the importance of correct connection and integration of financial data with a wide range of non-financial indicators containing information on intangible assets, key performance indicators, corporate governance, etc (Hilkevics and Semakina, 2019; Paptsov et al., 2019; Titova et al., 2019; Lateef et al., 2019; Dyussembekova et al., 2019).

The issues of increasing the effectiveness of business relationships with various groups of stakeholders for sustainable development and providing them with the necessary information were considered in many works (e.g. Cardoso et al., 2018). M.A. Vakhrushina, believes that “the integrated reporting will significantly increase the company investment attractiveness, provide potential investors with transparent information revealing the current and future risks not only in financial but also in social and environmental spheres” (Vakhrushina, 2014).

O.B. Fomina and M.V. Fomin define integrated reporting as “a new direction in the development of corporate reporting, which aims to provide various stakeholders with information about the key factors of the present and future value creation by the company...” (Fomina, 2014). The researchers claim that such reporting should provide an integrated overview of value generated by the strategy, management efficiency, and company capabilities in the long term. N.V. Malinovskaya considers integrated reporting as an element of managing an
economic entity. According to her, the integrated reporting is a “systematic factual and forecast financial and non-financial information of the reporting entity about the ability to create value for the organization and its stakeholders in the short, medium and long term, and its business model, formed in accordance with the national or internationally recognized standards and intended to satisfy public interests of the interested users” (Malinovskaya, 2018).

The issues of integrated corporate reporting are becoming increasingly popular in the scientific community. However, several problem areas and numerous issues remain the topic of discussion. This indicates the importance and necessity for further deep and informative research on non-financial corporate reporting, along with the development of methods of its preparation under the impact of various types of capital on ensuring business sustainability.

3. Materials and Methods

The laws and regulations of the Russian Federation in the field of corporate governance, accounting (financial) and non-financial reporting; information and analytical materials of consulting companies and international organizations involved in research and implementation of integrated corporate reporting; integrated reporting and other non-financial reports of Russian organizations registered in the National Register of non-financial reports; as well as results of the author’s research of non-financial reporting of Russian and foreign companies served as the information base for this study.

The research tools used in this research involved systematic analysis, empirical research, the principles of formal logic, synthesis and analysis of theoretical and practical data.

4. Results

One of the key elements of the concept of integrated reporting is the active use of the category “integration” in relation to business goals and objectives considered in the context of the so-called integrative thinking. At the same time, the traditional model of accounting and financial reporting is based on the need to present information from a financial perspective, which today is considered as the principal perspective. A comparison of the accounting and financial reporting indicators of different countries leads to the conclusion that, in general, the composition of forms and key articles evaluated by different users is identical. Table 1 summarizes the leading indicators of interest to users of the reporting information in several countries.

<table>
<thead>
<tr>
<th>Country</th>
<th>Leading indicators</th>
<th>Information users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Russia</td>
<td>Indicators of liquidity, solvency, sustainable development, profitability, efficiency of financial and economic activities</td>
<td>Shareholders, owners, controlling state bodies, investors, creditors, suppliers, customers</td>
</tr>
<tr>
<td>Belarus</td>
<td>Indicators of liquidity, solvency, sustainable development, profitability, efficiency of financial and economic activities</td>
<td>Shareholders, owners, controlling state bodies, investors, creditors, suppliers, customers</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>Indicators of liquidity, solvency, sustainable development, profitability.</td>
<td>Shareholders, owners, controlling state bodies, investors, creditors, suppliers, customers</td>
</tr>
<tr>
<td>Great Britain</td>
<td>ROM, ROFA, ROS, ROL, BER, ROA, ROE, ROIC, ROCE, ROTA, ROBA, RONA, OPR, NSAL, GM, EBIT, SAL, NINC, VCOST</td>
<td>Shareholders, owners, controlling state bodies, investors, creditors, suppliers, customers</td>
</tr>
<tr>
<td>China</td>
<td>ROM, ROFA, ROS, ROL, BER, ROA, ROE, ROIC, ROCE, ROTA, ROBA, RONA, OPR, NSAL, GM, EBIT, SAL, NINC, VCOST</td>
<td>Shareholders, owners, controlling state bodies, investors, creditors, suppliers, customers</td>
</tr>
<tr>
<td>France</td>
<td>ROM, ROFA, ROS, ROL, BER, ROA, ROE, ROIC, ROCE, ROTA, ROBA, RONA, OPR, NSAL, GM, EBIT, SAL, NINC, VCOST</td>
<td>Shareholders, owners, controlling state bodies, investors, creditors, suppliers, customers</td>
</tr>
</tbody>
</table>

*Source: Compiled by the authors*

The analysis of table 1 allows concluding that the interests of external and internal users of reporting in various countries are limited mainly to information on investment attractiveness, sustainable development, efficiency and profitability of the economic entity.
V. V. Berdnikov (2012) notes that “in addition to traditional indicators (business activity, asset coverage ratio, cash flow profitability, discounted payback period and added value), in selecting and subsequent monitoring of the investment projects implementation it is necessary to use indicators assessing the project’s risk potential for investors and future benefits from participation in the company’s project:

- investment indicators (NPV; IRR; MIRR);
- NPV, IRR, and MIRR investment indicators adjusted to the value of options;
- growth indicators (sales revenue; sales profit; asset value);
- performance indicators (gross margin; EBITDA return on assets; return on invested capital (ROIC));
- solvency ratios (interest coverage ratio, TIE; EBITDA/TD ratio);
- cost indicator (MVA value added);
- risk indicators (cash flow volatility $\delta^2(DCF)$);
- risk/return indicators (VaR/NPV; NPV/volatility; RAROC (return on assets adjusted for risk));
- specialized option pricing indicators with the probability of each option – Po.

Their selection is customized to each option type based on simulation” (Berdnikov, 2012).

Even though some companies develop innovative approaches to strengthening the accounting for various types of capital, investors demand more objective and unambiguous data. Therefore, disclosure of non-financial indicators helps to establish a firmer relationship with investors. Given the absence of generally accepted models for assessing and measuring the effectiveness of information in integrated corporate reporting, it seems important to define the suggested criteria and indicators for integrated reporting.

The authors believe that a reliable assessment of the company’s ability to create added value involves considering four groups of criteria that need to be reflected in corporate integrated reporting. These criteria ensure a reliable objective assessment of the company’s ability to create added value with minimal costs:

- integrated value-creating structure (value chain);
- management and strategy (internal processes);
- intellectual capital management (innovation and knowledge);
- competitiveness and best practices.

In this context, key performance indicators (KPIs) are characterized as an important element of integrated corporate reporting. They contribute to a comprehensive assessment of financial and non-financial factors affecting business performance. While managers and financial analysts have long used key performance indicators, their presentation in the corporate integrated reporting allows other categories of stakeholders to widely use their possibilities. In this context, key performance indicators (KPIs) are characterized as an important element of integrated corporate reporting. At the initial stage, it is necessary to determine the strategic goals of the company, considering both material and non-material aspects, financial and non-financial criteria. Strategic goals must relate to the expectations of each category of information users.

An integrated report should indicate the quality of the company’s relations with stakeholders; that is, how and to what extent, the organization understands, recognizes and responds to their legal needs and information requests.

In fact, understanding the needs of external users of the reporting information is crucial not only to ensure their effective capital participation but also to correctly determine the overall business performance. In the absence of understanding with stakeholders, the company management may decide that they determined the value correctly which is far from reality. To prevent this, it is necessary to establish a direct dialogue between the parties to ensure maximum trust and interaction. Once specified the strategic goals should be adjusted.
Identifying the expected result for each action allows managers to achieve specific goals and planned results. An integrated report should explain the revenue estimation, i.e. KPIs allow quantifying the ability of management to achieve strategic goals. While the leading indicators presented independently of value-added strategies and processes can complicate business reporting, a comprehensive set of indicators related to the strategy and the supported context will be a useful way to improve the business model.

KPIs should cover short-term, medium-term and long-term periods, including differentiated forecasts and targets. A comparison of the calculated data with actual performance and demonstration of the forecast management accuracy is of great importance to shareholders. Such comparison allows converting elements of integrated corporate reporting into revenue forecasts and management effectiveness, which, as a rule, are considered important for making investment decisions in the financial markets.

Accurate forecasts are an effective element of business success, as they provide a certain guarantee for investors. At the same time, investors themselves often do not have professional skills in checking managers’ forecasts, identifying errors in forward-looking calculations and results when analyzing integrated corporate reporting, etc. This results in a noticeable decrease in information stability in the financial market and affects the quality and completeness of the data presented.

To be useful, key performance indicators must have some important characteristics. First, they can be incorporated into performance measurement systems designed for internal purposes. According to international rules, the reporting package should clearly distinguish between external information and information communicated to senior management for decision-making purposes (Arniati et al., 2019; Vokshi, 2018; Goryushkina et al., 2019; Kolupaev et al., 2019). This means that most of the information used by managers to conduct business and evaluate the company’s achievements coincide with the requirements of investors and other interested parties in decision-making.

Secondly, key performance indicators should be clear and understandable. Thus, integrated corporate reporting will be able to provide any information that allows stakeholders to clearly understand each performance indicator. Therefore, it is necessary to provide for the following actions for each key indicator: defining the content and calculation methodology, determining the purpose and justifying it to be the “key” and source of initial data and any assumptions.

Third, key performance indicators for certain time limits must be comparable between different organizations (at least within the same industry). Such comparability is provided at two different levels:

1) intercompany comparability;
2) comparability over a certain period.

The combination of the above groups of elements allows developing a working structure for an objective assessment model of the company’s ability to create added value based on balanced indicators of business efficiency and sustainability (Figure 1).
While the economic entities can adopt this framework to manage goals and determine strategies and behaviors, investors and other interested parties will be able to assess the quality of management and the company’s ability to create value.

Each group of criteria should be analyzed in three perspectives: economic, environmental and social. This provides the necessary integration of financial and non-financial information. Moreover, each aspect must be evaluated through various forms of capital (human, social, natural, intellectual, industrial and financial). At the same time, maximizing opportunities and minimizing risks ensure competitive business advantages. Therefore, for each of the used capitals, one must consider the main risks and opportunities.

**Integrated value creation structure (value chain).** The main focus is on the creation of economic, social and environmental value chain, as well as the assessment of its individual links such as “Consumers and custom-
ers” and “Supply and logistics”. This allows understanding the basics of business development, the principles of added value distribution; the opportunities for expanding cooperation within the value chain, as well as for protecting and strengthening relationships with customers and suppliers; the potential to reduce adverse environmental impacts through the value chain; the opportunities to contribute to the company development in specific geographical areas (districts, areas of low social level, developing countries) or with special social significance, etc.

**Consumers and customers.** The supply of products and services complying with customer requirements is a key aspect in competitive markets. Thus, determining the most appropriate attribute value from a client’s perspective becomes essential. Subsequently, in terms of parameters and key performance indicators they can be considered as the leading indicators of a company’s ability to create value by increasing its capital through attracting customers; by providing products and services meeting customer expectations; by achieving an acceptable level of customer profitability; by controlling the risk of non-fulfillment of the customer’s financial obligations; by creating and protecting corporate brand; by establishing closer and synergetic relationships with customers, etc.

**Supply and logistics.** Reliable supply is an important factor in competitive advantage and sustainable performance. This aspect is indicative of the company’s performance; the cost of the procurement process in terms of the total cost of ownership, which, in addition to the cost of buying materials, involves paying for expenditure activities (issuing orders, receiving goods, inspection of goods, etc.), maintaining inventory (physical space, cost of capital, inspection, etc.) and other qualitative aspects (such as waste, alteration, return of the goods); stability of relations with suppliers, etc.

**Management and strategy (internal processes).** When constructing the KPI system for this criterion group, it is possible to identify two objectives. The first objective relates to the assessment of internal processes in terms of their effectiveness and affects various forms of capital available to the organization. In this case, the efficiency of internal processes can be determined by assessing:

- performance of internal processes;
- transaction costs;
- environmental impacts of the technologies used, in terms of pollution, energy consumption, emissions, recycling, etc.;
- possibility of creating new jobs;
- compliance with legislative and regulatory requirements related to life safety, etc.

The second objective is to evaluate the content of the cost of company performance. The leading performance indicators associated with this aspect may meet the following criteria:

- setting the maximum allowable amount and value of unsuitable waste;
- waste reduction options;
- the possibility of reducing fines and litigation costs.

**Intellectual capital management (innovation and knowledge).** Innovation and knowledge are the core values of any organization. Particular attention should be paid to this aspect from the point of identifying useful elements for assessing the current and future competitive advantages of the company and increasing the business model sustainability.

The leading indicators can measure the innovative potential of a company in terms of the following criteria:

- new products/services developed during the reporting period;
- new technologies/processes/materials introduced in the reporting period;
- company’s ability to protect innovations through patents and trademarks;
- innovation process efficiency;
- efforts aimed at implementing innovations (investments, expenses, etc.), etc.
This aspect also relates to the management of knowledge and human resources and determining their impact on employee satisfaction and productivity, their loyalty, increasing motivation, retaining experienced personnel and attracting highly qualified specialists, providing opportunities for staff development, organizational climate, safety in the workplace, respect for human rights and equal opportunities, etc.

**Competitors and best practices.** This aspect is designed to monitor competitors and their performance and allows for a comparative analysis of business processes, thereby achieving intercompany comparability.

Company performance can be better measured compared with the economic, environmental and social results of specific competitors or industry as a whole. Accordingly, the leading indicators in this group of criteria should emphasize the strengths and weaknesses of the business:

- profitability and growth of comparable competitor groups;
- various cost structures reflecting alternative process configurations, technologies, customer goals, etc.;
- alternative strategies and their social and environmental impact.

**Discussion and conclusion**

The preparation of integrated reporting is an important step towards the implementation of major changes, both in the reporting organizations themselves and in their business environment. Such changes affect the strategically important issues, particularly related to the efficiency of corporate objectives implementation and the formation of value chains.

The research allows distinguishing four criteria aspects of value creation: an integrated structure of value creation (value chain); management and strategy (internal processes); intellectual capital management (innovation and knowledge); competitiveness and best practices.

Accordingly, the authors identify four criteria characteristics in an integrated system for assessing business performance, based on which they recommend assessing an organization’s capacity to create value. It is these four characteristics that allow providing a reliable objective assessment of the company’s ability to create added value with minimal costs. Each criteria group should be considered from three perspectives: economic, environmental and social, which provides the necessary integration of financial and non-financial information. Moreover, each aspect of the model must be considered in relation to various forms of capital (human, social, natural, intellectual, production and financial). The analysis of business performance allows determining business advantages of the company, developing measures for decision-making on maximizing opportunities and minimizing risks. Thus, for each of the capitals used, it is necessary to consider the key risks and opportunities.

The authors’ assessment model allows determining the business advantages for the company and areas of maximizing opportunities and minimizing risks for each of the used capital, reducing the existing information gap between financial and non-financial information, and increasing business transparency.

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COMPARATIVE CHINA CORPORATE GOVERNANCE STANDARDS AFTER FINANCIAL CRISIS, CORPORATE SCANDALS AND MANIPULATION

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Abstract. Modern corporate governance standards and principles is becoming vital issues in developing countries such as Vietnam, China, India, Indonesia, Myanmar, Bangladesh, etc. The 2006 Taiwan Conference on Corporate Governance showed current company system needs not only back-end CG solution such as “golden parachute” but also internal mechanisms. There are also a few researches which have been done in the field of international corporate governance standards. This paper chooses a different analytical analysis style and among its aims is to give some certain systematic conclusions on China corporate governance (CG) system. First, it separates China standards into two (2) groups: China 2001 and Taiwan 2002 CG principles covered in group 1 and, group 2, including corporate governance principles from Hong Kong conclusion paper and KPMG guides, while it uses OECD principles as reference. Next, it separated independent contents with analysis and identified differences between these above set of standards which are and have been encouraged to use as reference principles for many organizations. In addition to, it aims to build a selected China comparative set of standards for corporate governance system in the post-crisis and scandal time. Last but not least, this paper illustrates some ideas and policy suggestions in order to overcome obstacles in China corporate governance system such as: insider trading, false financial reporting and concentration of state ownership.

Keywords: corporate governance standards; board structure; code of best practice; financial crisis; corporate scandals; market manipulation; internal audit


JEL Classifications: G00, G390

ABBREVIATIONS

CG : Corporate governance
BD : Board of Director
CSR : Corporate Social Responsibility
IA : Internal Audit
EA : External Audit
CEO : Chief Executive Officer
SOA : Sarbanes Oxley Act
OECD : Organization for Economic Cooperation and Development
ICGN : International Corporate Governance Network
NYSE : New York Stock Exchange
1. Introduction

A 2003 study by the World Economic Forum ranked China 44th out of 49 countries surveyed in terms of quality of corporate governance. Therefore, Chinese companies need to enhance their corporate governance structure by applying Western and international corporate governance best practices. This is one of main goals of this paper.

After Asia crisis 1997–1999, Taiwan Securities and Future Commission began to enhance importance of corporate governance in public companies. Therefore, here, we try to make a comparative analysis on different Corporate Governance approaches in China region. Despite of trying to select an easy-reading writing style, there is still some academic words need to be explained in further.

This paper is organized as following. Research literature and theories are put in the first two sessions. Then, it followed by introduction of our research methodology in session 3 (3rd). Next, session four (4) illustrates our familiar four (4) groups of empirical findings. After that, Fifth (5th) session turns to our conclusion and policy suggestion. Additionally, there are exhibit session which covers some summary of this paper’s analysis and models from international organizations such as auditing firm. Besides, a glossary note is provided with information for reference and because of reducing repeating terminology.

2. Research literature review

During the post crisis and post scandals time, there are lots of researches and surveys on importance of corporate governance and its reasonable structure and participants such as shareholders.

Johnson et al. (2000) stated that the “Asian Crisis” of 1997–98 affected all the “emerging markets” open to capital flows. Measures of corporate governance, particularly the effectiveness of protection for minority shareholders, explain the extent of exchange rate depreciation and stock market decline better than do standard macroeconomic measures. A possible explanation is that in countries with weak corporate governance, worse economic prospects result in more expropriation by managers and thus a larger fall in asset prices.

Next, The Taiwan CG Best Practice Code (2002) stated all directors, supervisors, employee and shareholders must perform their functions to enhance corporate governance. Then, Horn (2011) focused on the transformation of company law and corporate governance in the last decade. Here, the article illustrates how company law has become increasingly focused on the rights of shareholders, while worker rights have been relegated to the area of social policies and labour law. The study also traces the shift from a legislative programme centred on company law harmonisation towards a regulatory approach based on minimum requirements and mutual recognition, increasingly geared at adjusting the governance of corporations to the demands of liberalised capital markets. Also, Kumar and Singh (2013) mentioned that literature highlights that risk management, board practices, remuneration system, transparency and disclosure norms were found lacking in different aspects. Brian (2014) pointed that while the “imperial” CEO who surged to prominence in the 1980s became outmoded for the most part after corporate scandals at the start of the 2000s, this was not the case with large financial companies. The continued boldness of “star” CEOs in the financial services industry plausibly contributed to the market turmoil of 2008 but the financial crisis emphatically ended this corporate governance “free pass” banks had enjoyed. Dobre et al. (2015) and Arniati et al. (2019) provided evidence that the existence of corporate governance elements do positively influence the audit quality of the entity, especially when it comes to the number of members that the executive board has.

Al-Gamrh et al. (2018) found a positive influence of corporate governance strength on the accounting performance, but a negative influence on the firms’ economic performance. In normal times, corporate governance mitigates the negative influence of leverage and risk on the accounting and economic firm performance. Mahdy and Dina (2019) addressed the need for proactive corporate governance, using meta analysis to reconcile conflicting research findings, employing alternative theoretical underpinnings that go beyond agency theory, thinking blockchains, and developing an agenda for corporate governance convergence.
In an effort of internal assessment of corporate governance, what is the common and comparative standardized set of so-called China corporate governance standards?

**Theory of Corporate Governance, Scandal and Market Manipulation**

**Theory of manipulation**

There are different views on market and stock manipulation which are suggested to prevent their negative impacts in securities market in state and company laws. Firstly, Kenneth M. Breen, Keith W. Miller, Morgan J. Miller, and Thomas A. Zaccaro., (2008) pointed the possibility of manipulation relating to short-selling opportunities might be considered in relevant regulations. Lambert, Caroline and Sponem, Samuel (2003) argued that earning manipulation can be a tool to fulfill the role of efficient operating of companies in Anglo-Saxon corporate governance context. They also found that in companies with weak financial context, management controllers and operational managers can manipulate profits under pressure from shareholders. In addition to, there are evidence in stock market which disclose market manipulation can be used either to increase market value of the firm to benefit management team, or be used in stock price downturn for some private speculation. Beatriz García Osma, and Encarna Guillamón-Saorín, (2009) suggested that strong governance may result in lower manipulation. Therefore, we can see technique of market manipulation can be done with relevance of several individuals or groups.

**Theory of corporate governance and financial crisis**

First, OECD (2004) stated that corporate governance structure identifies distribution of rights and duties of different participants such as board, managers, shareholders and other stakeholders in the corporation. The UN Global Compact and IFC (2009) offered ten (10) principles to govern the company in fields of Human rights, Labor Standards, Environment and Anti-corruption. The Economist Intelligence Unit, (2002) stated in their report, Corporate governance is about facilitating corporate fairness, transparency and accountability. After Asia crisis, in 2002, KPMG Ltd. identified strong corporate governance is a foundation for preserving reputation and values, such as investor confidence, capital access, employee satisfaction, customer loyalty and organizational sustainability. And Thailand Stock Exchange, until 2006 defined corporate governance as a set of structures and processes b.t board, management and shareholders to strengthen the co.’s competitiveness, growth and long-term shareholder value, together with interests of other co.’s stakeholders.

Up to now, there are different analytical views on corporate governance and its importance.

**3. Research methodology**

Firstly, we analyze and compare corporate governance principles in each of two (2) different groups including: 1) Group 1 – China CG representative standards including China mainland and Taiwan Corporate Governance Principles which have a few modifications in corporate governance principles after the crisis period; and 2) Group 2 - Relatively good corporate governance group including Hong Kong corporate governance principles and KPMG Guide for Directors;

We also use, but not limited to, international standards of corporate governance such as: OECD, ADB and Mc Kinsey corporate governance principles and surveys as reference.

Then, we suggest on what so-called comparative China corporate governance principles which is aiming to create a common and sharing background for public and private corporations interesting in different aspects of corporate governance subjects. See Exhibit 2 for our model.

In general, it can be considered as the recommendation to relevant countries’ government and other relevant organizations for public policy and necessary evaluation. For a summary of our standards, see Exhibit and the
4. Empirical findings

A - Findings on Corporate governance issues after financial crisis, corporate scandals and market manipulation

There are several popular issues including: a weakness in information disclosure and transparency of corporations, as well as the matter of roles, values and participation of independent directors in the corporation.

Also, we can find out another corporate governance (CG) issue. It is, the lack of practices for connecting and participation of different types of shareholders such as individual, institutional and foreign shareholders. Another problem is the separation of conflicts of interests of controlling shareholders and other types of shareholders.

Moreover, the construction of operational processes of supervisory board is among interesting matters in post-crisis and post-scandal periods. Last but not least, the effectiveness of board, committees and internal regulations are also needed to audit.

Generally speaking, Chinese enterprises follows a socialist market economy theory and is in the transformation and corporatization stage which shows very fast growing GDP number, so it needs lots of efforts on operational improvement.

B - Findings on Ways of Manipulation during Corporate Scandals

Several Manipulation Techniques found out during corporate scandals involve, but not limited to:

B.1 – The manipulation techniques in the income statement:
Here, there is the involvement of management in preparing financial statements which contributed to transaction manipulation. For example, the case of Sunbeam showed us the earning was manipulated for smooth income purposes, by allowing contracts or customers paid in months later.

B.2 - The manipulation techniques in both the income statement and balance sheet:
We can find here evidence from Tobu Railway Company scandal, a Group company with subsidiaries, which is involved in using accounting techniques to hide liabilities or losses in financial statements. Or another case, famous Enron scandal, has to be verified its hiding of $1 billion losses.

B.3 - The manipulation techniques relevant to international accounting practice code:
In our previous paper series on Corporate Governance, we indicated that there is gap to manipulate the asset values and its depreciation time by utilizing international accounting standards. Also, a switching of inventory method, allowed by laws to some extent, is also taken into account for transaction manipulation.

B.4 - Other manipulation techniques net belong to above classifications:
Market Manipulation can happen in an event in which groups of participants such as shareholders concern in manipulation. For example, Fairfax Financial Holdings Ltd., Toronto, (2006) found that some group of hedge funds tend to manipulate market. Or the using of initial sale in transaction manipulation can be another example for this category.

C - Actions on Preventing or Controlling negative manipulation

Necessary actions to prevent or control negative market manipulation are, but not limited to, designing proper measures to provide sound results on both positive and negative effects of market manipulation action and information. Additionally, there is the fact that the analysis techniques used in review of big corporations’ fi-
nancial statements such as Enron needed to be enhanced. On the other hand, the competence of the Board and the control and reporting system also need to be strengthened.

D - Findings on Construction of Comparative International Corporate Governance Standards

These findings will be shown in a detailed analysis of a model indicated in the later sessions.

<D.1> - Group 1 - China and Taiwan Corporate Governance standards analysis

The China CG Principles


It is said that one of its significant advantages is to clarify full rights of shareholders, including but not limited to, participation in major matters, and their duties in the invested company. Additionally, similar to Japan Code, China Code considers the Company as a whole when it makes conditions of fully disclosure of basis for pricing of related-party transactions. Besides, it also gives another party “affiliates” in provision regarding to preventing them from transferring capital and assets of the co. through different means.

And different from some other Asian Codes, it stated the independence of the co.’s assets and controlling shareholders’ invested assets which has to be recognized in proper accounting and management procedures. Generally speaking, The China 2001 Code has a meaningful objective and solid focus on shareholder and their participation in the company. Besides, it is good to point that directors should have relevant training on their roles and duties, as well as buying liability insurance for directors which does not cover liability for violating laws. However, it still has not pointed well interest conflicts.

The Taiwan 2002 Corporate Governance Best Practice Principles


It pays lots of attention to shareholders and directors importance, esp. the roles of the independent directors, as well as provided details on information disclosure. Moreover, it indicated the co. as a whole should maintain environmental protection and communication with relevant stakeholders such as bankers, creditors, consumers, and employee.

Different from most of Asian Codes, there is an inspector at the GM who will examine documents by BD and SB. Also, it shows a good view on criteria for BD meeting such as sound recording and video taping.

However, it would be better to present clear views on the chairman of the co. and the chairman of the GM.

Comparison between the China and Taiwan Corporate Governance Principles

Different from most of Asian Codes, there is a focus on controlling shareholders in the China 2001 code. For example, it prevents them from damaging other shareholders’ legal rights by means such as assets restructuring. Moreover, it clarifies roles of directors when participating in BD meeting such as; presenting clear opinions on topics with responsible manner. Also, it makes a sound point when it suggests the BD may establish a corporate strategy committee (see Figure 1).
On the other hand, the 2002 Taiwan Code considers roles of Supervisory Board as a vital element in corporate governance structure. It indicates a supervisor need to understand duties and functions of BD and Managers, as well as it is necessary for them to attend regular meeting of BD. Through its 2002 CG Code, it signifies the compliance with laws and regulations. And it strengthens the role of information transparency as one of co.’s missions. Next, it makes sense when pointing a shareholder should be in a good faith with other shareholders or make MGT involving in illegal earning transactions. But it has to identify actions from compliance division in more details. See Table 1.

**Table 1.** China Corporate Governance (CG) representative standards

<table>
<thead>
<tr>
<th>Subjects or parties</th>
<th>Main quality factors</th>
<th>Sub quality factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audit committee (AC)</td>
<td>Responsible to Board of Director (BD); at least one with expertise in accounting or finance; Established by BD; AC oversee External Audit (EA) and Internal Audit (IA) interaction;</td>
<td></td>
</tr>
<tr>
<td>CEO/General manager and The Chair</td>
<td>The Chair, not a CEO, attend General meeting (GM) and inquire shareholders’ opinion; N/A (for further research and implementation)</td>
<td></td>
</tr>
<tr>
<td>Corporate Secretary (CS)</td>
<td>Be in charge of information disclosure; provide consultation; contact shareholders; BD and Management (MGT) actively support CS work;</td>
<td></td>
</tr>
<tr>
<td>Compliance officer</td>
<td>May engage legal counsel to ensure legal framework; N/A (for further research and implementation)</td>
<td></td>
</tr>
<tr>
<td>Board of Directors</td>
<td>Operate in independent manner; faithfully, honestly and diligently; Composition ensure effective discussion and timely decision making; Liability of compensation if violating laws and causing damages to co.;</td>
<td></td>
</tr>
<tr>
<td>Independent director</td>
<td>Independent from major shareholders; May receive liability insurance as GM resolution;</td>
<td></td>
</tr>
<tr>
<td>Supervisory board to the Management</td>
<td>professional knowledge in law or accounting; meet periodically;</td>
<td></td>
</tr>
<tr>
<td>Supervisory to the Board of Directors (SB)</td>
<td>accountable to all shareholders; professional knowledge in law or accounting; meet periodically; professional knowledge and skill, time and energy; Liability of compensation if violating laws and causing damages to co.; honest, fair and practical attitude;</td>
<td></td>
</tr>
<tr>
<td>Internal control</td>
<td>Comprehensive and effective; SB supervise BD and managers to perform operations;</td>
<td></td>
</tr>
<tr>
<td>Internal audit</td>
<td>No subordinate relationship b/t Co.’s IA and controlling shareholders or their IA;</td>
<td>Evaluate problems of IA system and efficiency of operation;</td>
</tr>
<tr>
<td>External audit</td>
<td>Engaged or replaced based on recommendation from AC;</td>
<td>Can be an independent CPA;</td>
</tr>
<tr>
<td>Disclosure and transparency</td>
<td>Set efficient communication channel with shareholder;</td>
<td>Explicit and Concrete Principles of Authorization for BD in GM;</td>
</tr>
<tr>
<td>Shareholders</td>
<td>Fair treatment to all shareholders;</td>
<td>Participate in major events of company;</td>
</tr>
<tr>
<td>The corporation as a whole entity</td>
<td>Ensure the CG Code have provisions to guarantee full exercise of shareholders’ rights; Clarify with directors rights and obligations;</td>
<td>Design measures to prevent affiliates from misappropriating co.’s capital and assets;</td>
</tr>
</tbody>
</table>

**<D.2> -Group 2 – Relative Good Corporate governance group analysis**

After the financial crisis 1997-1998, Hong Kong Exchanges and Clearing Limited has some improvements in their 2004 Conclusion of Corporate governance Codes.

**Hong Kong’s 2004 Conclusion on Corporate Governance Code:**

In the 2004 Code, so-called, it stated that companies can issue their own Code of Practice. It also enhanced roles of corporate secretaries in implementing good CG and in keeping minutes of BD meeting and other committees meeting.

Good recommendations involved in the 2004 Code include, but not limited to, specifies roles of AC with the Corporate Governance Report in which it might identifies reasons the BD takes different views on appointment or removal of EA.

Besides, it indicated there might be several chair at board committees such as independent board meeting chair, who can show up at GM to answer shareholders.

A minor point might be it will provide better views if it indicates more on roles of supervisory board. In summary, the 2004 Code strengthen the duties of AC in relation with EA, as a key representative body of the corporation.

**KPMG-Hong Kong Guideline for Directors analysis:**


According to the code, the responsibilities of the co. to customers are recognized. One example is the commitment to provide safe products to meet customers’ expectation.

It is also recommended that disclosure should be made as soon as practicable. And the co. should disclose transactions with a “connected person” such as chief executive, controlling shareholder as well. However, the Code has little attention to the role of CEO.

**The 1st Establishment of a so-called relatively Good Corporate Governance standard**

This following table is built with the consideration of comparative analysis of two (2) selected above organizations. See Table 2.
### Table 2. A relatively Good Corporate Governance standards

<table>
<thead>
<tr>
<th>Subjects or parties</th>
<th>Main quality factors</th>
<th>Sub quality factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audit committee</td>
<td>Separate secretary keep meeting minutes; build non-audit services policy with EA;</td>
<td>AC Chair can answer at GM;</td>
</tr>
<tr>
<td>CEO and The Chair</td>
<td>Chairman approve board meeting agenda; propose separate resolution at GM; Both have written roles;</td>
<td>Chair ensure directors receive adequate, reliable information;</td>
</tr>
<tr>
<td>Corporate Secretary</td>
<td>provide access and services to all directors; keep meeting minutes;</td>
<td>Have effective communication with shareholders;</td>
</tr>
<tr>
<td>Compliance officer</td>
<td>Disclose name in interim report in securities transactions;</td>
<td>N/A (for further research and implementation)</td>
</tr>
<tr>
<td>Board of Directors</td>
<td>Meeting notice at least 14 days; balance of skills and experience;</td>
<td>Director may find independent professional advice;</td>
</tr>
<tr>
<td>Independent director</td>
<td>Can Attend A board meeting held to solve conflict with shareholder;</td>
<td>N/A (for further research and implementation)</td>
</tr>
<tr>
<td>Supervisory board to the Management</td>
<td>Act by BD or other professional advice;</td>
<td>N/A (for further research and implementation)</td>
</tr>
<tr>
<td>Supervisory to the Board of Directors</td>
<td>Professional consult accessed by committees;</td>
<td>N/A (for further research and implementation)</td>
</tr>
<tr>
<td>Internal control</td>
<td>Annually reviewed by directors covering operational, compliance and RM;</td>
<td>Procedures to handle price sensitive information;</td>
</tr>
<tr>
<td>Internal audit</td>
<td>AC ensure coordination b.t IA and EA;</td>
<td>N/A (for further research and implementation)</td>
</tr>
<tr>
<td>External audit</td>
<td>Discuss AC scope of audit;</td>
<td>Independence, skills, knowledge reviewed by AC;</td>
</tr>
<tr>
<td>Disclosure and transparency</td>
<td>Disclose any information enabling public to evaluate the co.’s position and avoid false market on co.’s securities;</td>
<td>Disclose transactions b.t companies and “connected person”;</td>
</tr>
<tr>
<td>Shareholders</td>
<td>Elect new directors at GM with biographical notes;</td>
<td>Voting by poll;</td>
</tr>
<tr>
<td>The corporation as a whole entity</td>
<td>Set code of conduct regarding to securities transactions;</td>
<td>Has development programs for directors;</td>
</tr>
</tbody>
</table>

### D.3- The 1st Establishment of a so-called comparative International Corporate Governance standards

**Comparison of corporate governance standards between <D.1> and <D.2> group**

Before we come to set up a set of general limited standards of corporate governance, we need to review the standards combined in the previous two (2) groups.

The advantages of Group 1 (OECD and ICGN) are related to clear division of responsibilities of Board, but not limited to, disclosure standards, though it still works more on board composition.

On the contrary, the relative Good Corporate Governance Group standards states quality requirements of audit committee and duties of the corporation as a whole (while Group 1 regarding BD as a whole).

**A so-called Limited Comparative International Corporate Governance Set of standards**

Based on the above analysis, we consider building comparative standards for a comparative International Corporate Governance system. See Table 3.
Table 3. The Comparative China Corporate Governance standards

<table>
<thead>
<tr>
<th>Subjects or parties</th>
<th>Main quality factors</th>
<th>Sub quality factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audit committee</td>
<td>Responsible to BD; at least one with expertise in accounting or finance;</td>
<td>Established by BD; may invite intermediary org. to give professional ideas; AC oversee EA and IA interaction; improve communication b/t BD and EA;</td>
</tr>
<tr>
<td>Nominating committee</td>
<td>Written duties and authority;</td>
<td>Established by BD; may invite intermediary org. to give professional ideas;</td>
</tr>
<tr>
<td>Numeration or Compensation Committee</td>
<td>Consult chairman or CEO remuneration proposals; approve performance-based compensation;</td>
<td>Established by BD; may invite intermediary org. to give professional ideas;</td>
</tr>
<tr>
<td>CEO and The Chair</td>
<td>The Chair approve board meeting agenda; propose separate resolution at GM;</td>
<td>The Chair, not be a CEO, attend GM and inquire shareholders’ opinion;</td>
</tr>
<tr>
<td>CFO</td>
<td>Helped by AC to raise concerns in a forum;</td>
<td>N/A (for further research and implementation)</td>
</tr>
<tr>
<td>Corporate Secretary</td>
<td>Be in charge of information disclosure; provide consultation; contact shareholders;</td>
<td>BD and MGT actively support CS work;</td>
</tr>
<tr>
<td>Compliance officer</td>
<td>May engage legal counsel to ensure legal framework;</td>
<td>N/A (for further research and implementation)</td>
</tr>
<tr>
<td>Board of Directors or Management Board</td>
<td>Operate in independent manner; Composition ensure effective discussion and timely decision making;</td>
<td>Liability of compensation if violating laws and causing damages to co.; faithfully, honestly and diligently; if BD or Managers resign, SB will investigate causes; cooperate well with inspector in GM;</td>
</tr>
<tr>
<td>Independent director</td>
<td>Independent from major shareholders;</td>
<td>May receive liability insurance as from GM resolution;</td>
</tr>
<tr>
<td>Supervisory board to the Management</td>
<td>Institutional investors join in supervisory for MGT; Act by BD;</td>
<td>professional knowledge in law or accounting;</td>
</tr>
<tr>
<td>Supervisory to the Board of Directors</td>
<td>Professional knowledge in law or accounting; meet periodically; co. set a channel for SB to communicate with employees, shareholders;</td>
<td>Liability of compensation if violating laws and causing damages to co.; accountable to all shareholders; cooperate well with inspector in GM;</td>
</tr>
<tr>
<td>Internal control</td>
<td>Comprehensive and effective;</td>
<td>SB supervise BD and managers to perform operations;</td>
</tr>
<tr>
<td>Internal audit</td>
<td>Evaluate problems of IA system and efficiency of operation;</td>
<td>No subordinate relationship b/t Co.’s IA and controlling shareholders or their IA;</td>
</tr>
<tr>
<td>External audit</td>
<td>Discuss AC scope of audit;</td>
<td>Engaged or replaced based on recommendation from AC; can be an independent CPA;</td>
</tr>
<tr>
<td>Disclosure and transparency</td>
<td>Explicit and Concrete Principles of Authorization for BD in GM;</td>
<td>Set efficient communication channel with shareholder;</td>
</tr>
<tr>
<td>Shareholders</td>
<td>Fair treatment to all shareholders;</td>
<td>Participate in major events of company;</td>
</tr>
<tr>
<td>Stakeholders</td>
<td>Ensure shareholders’ legal rights following state laws;</td>
<td>Co. provided information to banks and creditors to assess its financial position;</td>
</tr>
<tr>
<td>Accountability</td>
<td>BD show balanced, comprehensible assessment on co.’s position;</td>
<td>truthfully, accurately, completely and timely information disclosure;</td>
</tr>
<tr>
<td>Leadership</td>
<td>BD has duty for leadership and control;</td>
<td>Board leadership by chairman;</td>
</tr>
<tr>
<td>Employee</td>
<td>Enhance professionalism and knowledge of the law</td>
<td>AC consider hiring employees from EA; treat employees fairly and equitably;</td>
</tr>
<tr>
<td>3rd parties and conflicts of interests</td>
<td>A board meeting held to solve conflict with shareholder or director;</td>
<td>Specific Written agreements with equality, compensation and voluntarity principles;</td>
</tr>
<tr>
<td>The corporation as a whole entity</td>
<td>Clarify with directors rights and obligations; fulfill the function of supervisors;</td>
<td>Design measures to prevent affiliates from misappropriating co.’s capital and assets;</td>
</tr>
<tr>
<td>The Code</td>
<td>Ensure full exercise of shareholders’ rights</td>
<td>Disclose corporate governance structure and rules;</td>
</tr>
</tbody>
</table>

(Note: source are based on corporate governance standards of group <D.1> and <D.2> and the appraisal of these standards)

3. Conclusions

In previous analysis, we found out several key corporate governance issues including, but not limited to, the lack of an effective board as well as necessary mechanisms to build better disclosure system. The 2006 Taiwan Conference on CG also identified despite of its active growing capital market, the quality of independent directors are not enhanced well.
To lower its impacts, The 2001 China Code and 2002 Taiwan Best Practice Principles enhances recommendations on disclosure and transparency policies as well as connection between Board and SB.

Besides, the Hong Kong Code and KPMG Guide also play a vital role in guiding the Board toward setting a good CG system although it needs to give more views on internal and risk contents.

In CFA Institute Survey on China CG 2007, it shows accuracy of financial reporting are one of the most important factor in disclosure policy.

In consideration of corporate governance issues analyzed in the previous sessions, we proposed the main and sub quality factors in this paper a set of general China corporate governance standards in a limited model with selected above countries. Though limited, it has some implications for further research and proper recommendations to relevant government and organizations. And it also provides relevant academic and non-academic, lawyer and consultant, board and non-board people with minimum information for further researches.

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Towards Sustainable Development via Enhancing Viability of Small Businesses through Lending: A Case Study

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Abstract. Sustainable development of any country is hardly possible without viable small business. The development of small businesses has a number of advantages, which are expressed in the activation of structural adjustment of the economy, providing freedom of market choice and additional jobs, ensuring rapid cost recovery, and rapid response to changes in consumer demand. Small business leads to saturation of the market with goods and services, overcoming industry and territorial monopolies, and increasing the level of competition. In Kazakhstan, state support for small and medium-sized businesses is multi-level in the implementation of measures to reduce the tax burden, implement a set of measures to facilitate access to credit resources, simplify administrative procedures and permits, and organize regional centers to support small and medium-sized businesses in cities and rural areas.

Keywords: sustainable development; small business; lending; tools; sources; funds; programs; manufacturers; credit product; financing; services; indicators


JEL Classification: M2, O30

1. Introduction

There is unanimous agreement among development scientists, that sustainable development of any economy is closely related to viability of small business (e.g. Filipishyna et al., 2018; Baltgailis, 2019; Tvaronavičienė, 2017; Kowo et al., 2019; Amraoui et al, 2019). At the new stage of development, Kazakhstan is solving a wide range of tasks related to improving the competitiveness of the national economy. These are, first of all, economic restructuring, development of infrastructure and market institutions, as well as overcoming the shortcomings inherited from the previous stage: imperfection of the industry and technological structure; weak internal integration, and insufficient viability of productive forces (e.g. Petrenko et al., 2019; Tireuov et al., 2018).

Foreign experience of economic and social development confirms that small business can become a real factor not only for stabilization, but also for growth of the economy of Kazakhstan. Small business contributes to maintaining a proper level of competition, flexible restructuring of production, acceleration of innovation processes, formation of social orientation of market relations and employment growth. In this regard, the scientific analysis of the economic problems of small businesses in Kazakhstan is of particular importance in the conditions of economic reform, characterized primarily by the structural restructuring of the economy, the
need to stabilize reproduction processes and ensure sustainable economic development in the future (Tireuov, 2016a). Today, the problems of optimizing state and non-state influence on the small business sector, the lack of an integrated business management system at the level of the state and its regions, and a specific enterprise, are of particular relevance.

The state needs a number of studies on both the theoretical aspects of business, the definition of small and medium-sized businesses, and the study of practical issues of creating and effectively operating small firms, which were resilient to external challenges (Tvaronavičienė, 2018). The role of small and medium-sized businesses in the modern economy is difficult to overestimate. In developed countries, small and medium-sized businesses account for about 55-60% of enterprises and produce about half of the gross domestic product.

2. Methods of research

As it was already indicated above, small and medium-sized businesses are now the core of sustainable economic and political development. The development of small business has a number of advantages in comparison with large-scale production, which are expressed in the activation of structural adjustment of the economy, providing broad freedom of market choice and additional jobs, ensuring rapid cost recovery, and rapid response to changes in consumer demand.

Small business contributes to the saturation of the market with goods and services, overcoming industry and territorial monopolies, and increasing the level of competition (Tireuov, 2016b). In general, it can be noted that state support for small and medium-sized businesses in the Republic is multi-level: measures are being taken to reduce the tax burden, legalize property and assets, implement a set of measures to facilitate access to credit resources, simplify administrative procedures and permits, and organize regional support centers for small and medium-sized businesses in both cities and rural areas.

Currently, the state actively supports the constructive initiatives of public organizations of entrepreneurs. The society promotes the active life position of each entrepreneur in creating an economically developed state and improving the welfare of the population of the Republic.

3. The discussion of the results

Small business enterprises are an essential component and subjective base of a civilized market economy, an integral element of the competitive mechanism in the market. The entrepreneurial structure gives the market economy flexibility and carries antitrust potential (Altukhov, 2016). The development of small businesses solves the problem of employment and other social problems of the market economy, as well as provides a breakthrough in a number of areas of scientific and technological progress (Tvaronavičienė, 2018). For these reasons, the formation, maintenance and development of small businesses is currently part of the strategic objectives of the economic policy of the Republic of Kazakhstan.

The development of small and medium-sized businesses is the basis of any country’s economy. Without developed small and medium-sized businesses, it is difficult to talk about the stability of the macroeconomic situation of States. As a result, even at the dawn of independence, small and medium-sized businesses were identified in Kazakhstan as the most important sector of the economy.

Comprehensive support for small and medium-sized businesses has always been a priority of state policy. This is why, despite the difficult economic situation in the country in the 1990s, the number of small businesses has constantly grown. The formation and formation of small businesses in Kazakhstan took place in 4 stages: 1. Small business shortly before independence (1986-1990); 2. Small business at an early stage of transition to a market economy (1991-1996); 3. Small business at the stage of formation of market relations in Kazakhstan (1997-2000); 4. Modern stage of small business development. The first three stages are associated with Kazakhstan’s independence, the establishment of market relations and the emergence of new forms of ownership in the country.
During these stages, there was a gradual formation of the regulatory, legislative and institutional framework for supporting the development of private entrepreneurship. The current stage of development of small and medium-sized businesses in Kazakhstan, for example, is characterized by the introduction of a number of complex measures aimed at streamlining activities in the field of private entrepreneurship, including small businesses (Gumar, 2018).

In the socio-economic policy of the Republic of Kazakhstan, special attention is paid to the development of small businesses. Its role in improving the social climate is leading. First of all, employment is growing faster in this area and conditions are being created for stability in society.

In the modern world economy, the further development of the power of large monopolies is accompanied by the preservation and development of small and medium-sized firms, which is due to the scientific and technical revolution.

The share of small businesses in developed countries such as the United States, Germany, and Japan is very large, ranging from 97-99%, employing 50-70% of the country’s working population and creating up to 55% of the country’s gross domestic product (GDP). Similar parameters for the Republic of Kazakhstan differ from these results, since the share of small and medium-sized businesses in the country’s GDP is about 27%, the share of employees in the total number of employees is 37.4% (Makarova, 2019; Farooq, 2019).

Availablibility of funding is very important factor directly affecting viability of small and medium companies (Włodarczyk et al., 2018; Włodarczyk et al., 2018; Mackevičius et al., 2018). In the United States, credit is provided through the small business Administration, the small business insurance credit Corporation (Japan), and credit for medium and small firms (France). Special attention should be paid to the American experience of state support for small and medium-sized businesses. The United States is a country of not only giant corporations, but also small businesses that employ more than 50% of private sector employees. The small business administration (SBA) provides loan guarantees to small and medium-sized businesses (Ivanova, 2018; Bychkov, 2019).

In addition, it offers a wide range of financing methods - from microloans to loans to cover large debt (Gritsenko, 2019; Kiryan, 2017). Small business development centers provide many types of services related to specific projects in various fields (from home business to shipping and international trade), as well as technical assistance, management assistance, and loan applications.

In modern conditions, the mechanism for ensuring effective functioning of small and medium-sized businesses should be concentrated, first of all, to strengthening state support for small and medium-sized businesses (Gumar, 2018). In order to assist in the development and creation of favorable conditions for business in the Republic of Kazakhstan, state, government and industry programs have been functioning at various times (figure 1).

In order to further develop small and medium-sized businesses, government agencies have identified the main areas of support for small businesses in the near future, including the formation of an entrepreneurial climate, a competitive environment, and a system of public institutions that will encourage the private sector to create industries with high added value.
The government is pursuing an in-depth policy on financial sector reform and comprehensive development of small business support infrastructure: expanding the network of small and medium-sized business centers, business incubators, consulting, leasing and other firms, and creating data banks that specialize in servicing small businesses (Mizanbekova et al., 2016). It also provides for measures for cooperation of small businesses with large enterprises, as well as the implementation of segmentation of large inefficient industries and the creation of small enterprises on their basis. In order to attract entrepreneurs to the process of preparing legislative and regulatory acts, the Central Executive bodies have established Expert councils for the support and development of small and medium-sized businesses, which include representatives of public associations of entrepreneurs.

In general, the procedure for registering small businesses has now been simplified - introduced the model statutes, the registration fee is reduced by 4 times, a simplified procedure of certification of products for small businesses, introduced incentives for real estate registration and land rights, reduced the number of Supervisory and inspection state bodies and paid services carried out by them, held tenders for the transfer of small businesses engaged in production activities, unused spaces and land, as well as unfinished construction sites, a simplified accounting system has been introduced for small businesses.

The government of the Republic of Kazakhstan sets an ambitious goal-to increase the share of small and medium-sized businesses in the gross domestic product to 50% by 2050, currently the figure exceeds 28%.

By June 2019, more than 438 thousand legal entities and 1.16 million individual entrepreneurs were registered in Kazakhstan. One of the tools for achieving this goal is lending, which the authorities are trying to make more accessible to businesses through various government programs, such as the business Roadmap 2020 program, Damu regions III, and the Enbek program for the development of productive employment and mass entrepreneurship. Within the framework of the priority project lending mechanism, entrepreneurs engaged in the manufacturing industry and the agro-industrial sector can receive funding (Palatkin et al., 2018; Noeva et al., 2019). This is a new state program aimed at developing the production of so-called simple things in Kazakhstan, and the production of a product or service from the list of priority projects is a prerequisite. An entrepreneur can get a preferential rate at the expense of state subsidies. Loans are issued for investments and working capital replenishment.

The “Business Roadmap 2020” program is the main program to promote the development of entrepreneurship in Kazakhstan and support it using public Finance and tools. It sets out, among others, target indicators for the development of small and medium-sized enterprises (SMEs). Thus, it is planned to increase the volume of
output of SMEs by 1.5 times from the level of 2014, increase active SMEs by 50 percent and the number of employees in SMEs by 50 percent from the level of 2014. The Fund for financial support of agriculture issued 50 billion tenge to Kazakh farmers in 2018. The main credit products are the programs “Igilik”, “Sybaga”, “ Kasipker” and “Yrys”. The Fund credits rural entrepreneurs and those who are just getting ready to start a business under the program for the development of productive employment and mass entrepreneurship. In 2018, 30 billion tenge was allocated for these purposes in the country, of which 1.8 billion tenge was allocated to the North Kazakhstan region. In 2018 year 7.8 thousand rural entrepreneurs in Kazakhstan received micro-loans worth 28.4 billion tenge. The North Kazakhstan region (North Kazakhstan region) accounts for 3.4 billion of the total portfolio of micro-loans. 4.9 thousand rural producers (63% of the total number of all those who received state support) were trained under the “Bastau” project. 361 people were trained in SKO, which is slightly less than half of those who received preferential funding.77% of credit funds were spent on startup projects, 11% - on opening a new business. The implementation of the program for the development of productive employment and mass entrepreneurship allowed providing jobs to 9.2 thousand people in Kazakhstan, including 705 residents of North Kazakhstan region.

In 2017, the program for the development of meat animal husbandry “Sybaga” was updated. The update allowed to increase the loan amount to 70 million tenge, and also increased the loan term - up to 15 years. The interest rate has been reduced to 4% per annum. In 2018, according to the new version of “Sybaga”, 15 entrepreneurs received funding in SKO. The total amount of the loan was 530 million tenge. Thanks to the financial agreements reached, 1 thousand head of purebred cows will be delivered to the region in 2019. JSC “NUH KazAgro” started financing Kazakh farmers in the framework of the program for the development of productive employment and mass entrepreneurship for 2017-2021. The program “Enbek”, which is a continuation of the program “employment Roadmap 2020”, in which the national holding “KazAgro” has been participating since 2013. The program operators are subsidiaries of the holding – JSC “agrarian credit Corporation”, JSC “Fund for financial support of agriculture” and JSC “Kazagrogarant”.

In 2019, it is planned to Finance the program in the amount of 17.482 billion tenge. Of the 3,420 micro-loans for startup projects, 684 are planned to be issued. In addition, 2,736 micro-loans will be issued to start-up and existing enterprises and projects within the framework of anchor cooperation. Through a subsidiary of the National holding – JSC “Kazagrogarant” – if there is a shortage of collateral, borrowers can obtain guarantees from the budget. At the same time, the amount of guarantees varies, up to 50% of the loan amount is provided for existing businesses, and up to 85% for startups and start – UPS. Over a five-year programme implementation period (2015-2019) the amount allocated to funding provided in the $ 276 billion tenge, including means of the Republican budget of 154 billion, local budgets – 90 billion tenge of the National Fund – 31.5 billion. The implementation of support programs for SMEs has led to a significant increase in their lending. Currently, second-tier banks have allocated loans totaling more than 1 trillion to participants in government programs using the interest rate subsidy tool. In the amount of about 100 billion tenge, loans were issued under guarantees under state programs for the development of priority industries, primarily the manufacturing industry, which accounted for 34 billion tenge of loans. Small and medium-sized businesses are making a growing contribution to the economy of Kazakhstan – both the volume of output and its share in the country’s gross domestic product are growing steadily.

Within the framework of the “Business Roadmap 2020 program”, subsidies are provided at an interest rate for the implementation of business projects or guarantees are provided for Bank loans if the entrepreneur’s collateral is insufficient. “DKB-2020” has been operating since 2010, and during this time they approved subsidies for almost 15 thousand projects worth more than 2.2 trillion tenge, subsidies amounted to more than 250 billion. For the implementation of “DKB-2020”, you can get loans under the “Damu regions III” Program. Entrepreneurs in cities can take credit in priority sectors of the “DKB-2020”, for entrepreneurs working in rural districts, mono-and small cities of Kazakhstan-there are no industry restrictions. As part of the “Enbek” program, both beginning and existing entrepreneurs can get a loan. The program does not provide for industry restrictions, there is only a limit on the maximum amount of credit depending on the region. This budget program is designed to develop the market for micro and small businesses and help self-employed people who plan to open
and develop their own businesses. The programs are implemented by attracting budget funds and through The Damu entrepreneurship development Fund, which attracts funds from the budget and international sources, and provides preferential financing to transfer them to business together with Kazakh banks. There is a division into national and regional programs. In the case of the latter, co-financing is partially from the funds of the akimats, which is why they determine priority industries according to the needs of the region (Mizanbekova et al. 2019). For example, for the cities of Nur-Sultan and Almaty, this is the sphere of services, public catering, tourism and trade. For the Turkestan region, this is the manufacturing industry, for the Kyzylorda or Pavlodar regions – rural producers.

For small businesses in agriculture, specialized credit products are defined: loan guarantees, loans for the purchase of special equipment, target programs - “Ken Dala”, which Finance spring field and harvest works, for agricultural processing enterprises, subsidizing the interest rate on loans and leasing of technological equipment, for the purchase of farm animals, leasing of agricultural equipment.

Conditions depend on the specific lending program, but the most attractive is the interest rate: it is usually lower than for similar products in the rest of the financial services market. The bonus is the absence of commissions when making such loans in commercial banks. The overall level of innovation activity of enterprises in the East Kazakhstan region in 2017 amounted to 15.1%. When considering innovation activity by type of enterprise, it can be noted that the innovation activity of small enterprises is only 11.1%, medium-sized enterprises -24.9% and almost 48% (Figure 2).

Farmers of Kazakhstan participating in the project for the development of meat farming until 2020 will be provided with loans on preferential terms with a loan term of up to 7 years, and a remuneration rate of 6%. Under the “Enbek” program, you can get loans in the amount of up to 6,500 monthly calculation index (MCI) or 16 million tenge (for all cities except Almaty, Aktau, Atyrau, Shymkent and Nur-Sultan), up to 8,000 MCI or about 20 million tenge (for the cities of Almaty, Aktau, Atyrau, Shymkent and Nur-Sultan), at an interest rate of no more than 6% per annum for up to five years. Under the program to support small and medium-sized businesses in the manufacturing industry, the interest rate also does not exceed 6%, up to 1.85 billion tenge with a maximum loan term of up to 10 years.

The business Roadmap 2020 program includes several areas with their own conditions, subsidizing up to 50% of the nominal interest rate, and the possibility of obtaining a guarantee from the Damu Fund if there is not enough collateral. In 2016, the law “on grain” was amended and, in accordance with these amendments, moved from paper grain receipts to electronic ones. From June 1, 2017 on the portal minagro.kz the rating of grain receiving enterprises is available, which allows market participants to know which company they are operating with, and minimizes the risks of second-tier banks when accepting grain receipts as collateral (Usenbayev et al., 2019). The following changes are made to the system, such as voluntary online insurance of grain receipts, and online lending secured by grain receipts. Electronic grain receipts will be introduced in the future at the level
of the peasant economy, while electronic accounting is conducted at the level of elevators, but in the future it is planned with farms that grain that comes from farms to elevators will be taken into account.

Conclusions

The development of this small business sector can create stable conditions for further economic growth and mitigate economic and social difficulties. Small business is a flexible economic structure that quickly adjusts to market changes. The purpose of entrepreneurial activity is to produce and offer the market a product that is in demand and that brings the entrepreneur a profit. The development of technologies, science and technology constantly calls for a qualitative change in demand. This can be done by small businesses due to the flexibility and speed of decision-making. In today’s market, the response to rapidly changing demand is much more flexible than that of large enterprises, using lending tools, resources and opportunities.

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HISTORICAL AND LOGICAL STAGES OF ESTABLISHING THE FINANCIAL REPORTING SYSTEM: A PARADIGM APPROACH

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Abstract. The authors have conducted a retrospective analysis of the historical and logical stages of establishing the financial reporting system in the Russian Federation for determining the development direction of public reporting of economic entities and justifying the need to prepare integrated corporate reporting that meets the information needs of interested parties. The use of a paradigm approach made it possible to justify the regularities of the formative stages of accounting environment, to distinguish the key foundations of complex accounting information, to determine the current needs of business informatization and preparation of integrated corporate reporting.

Keywords: information; stakeholders; financial reporting; paradigm; historical and logical stages

JEL Classifications: M21, M40, G32


Additional disciplines: Financial economics

1. Introduction

Globalization of the modern economy “involving national economies in a single global reproduction process” (Sapozhnikova, 2009) leads to the deepening of inter-economic relations of various countries, the internationalization of business, the creation of corporations, and the effective use of capital of economic entities (Tvaronavičienė, 2018; Koval et al., 2019; Tvaronavičienė, 2019; Zeibote et al., 2019). The dynamism of economic processes requires increasing the informativeness of business management for solving strategic tasks outlined by the national programs of the Russian Federation, integrated understanding and major revision of the existing attitude to the content and composition of organizations’ reports, and a significant expansion of the amount of stakeholders. In the context of uncertainty, “a new reporting model that takes into account the interconnection of environmental and social factors, the quality of organizational management is needed” (Malinovskaya, 2018).

The main requirements imposed by users for reporting information are disclosure of information about the organization’s interaction with the environment and the use of adequate methods for preparing integrated corporate reporting.
In the present circumstances, the organization and conduct of business have changed significantly, which is becoming more open, informatively accessible, which expands the possibilities of investing capital, raising the value of the company, and increasing its effectiveness, taking into account the influence of various factors. “By disclosing information, a company gains a significant competitive advantage, improving its corporate governance system” (Ponomarenko, 2013).

Changes in economic conditions require new theoretical and methodological approaches to the areas of development of the accounting environment, the construction of accounting models that “adequately reflect the behavior of business entities” (Sidorova, 2013). It is impossible not to agree with the opinion of V. F. Paliy, who believes that it is necessary to “change the vector of development of accounting practice, align accounting practice with the objective conditions of economic development” (Paliy, 2018).

2. Literature review

The changes observed today in the field of reporting theory and practice can be described as a paradigm shift. To understand the essence of the ongoing changes, it is necessary to study the historical aspect of accounting paradigms. The application of the “paradigms” theory of the American science historian T. Kuhn (1922–1995) made it possible to identify institutional patterns and changes in the theory and practice of the development of accounting and the establishment of the financial reporting institution in the Russian Federation. T. Kuhn in his work puts forward the idea of a paradigm, i.e. the totality of generally recognized knowledge, the “disciplinary matrix”, within the framework of which the “normal” development of the theory and practice of a particular area of human activity is carried out (Kuhn, 1977). Thus, the criterion of scientific truth makes sense only within the framework of a certain paradigm, as a historically established system of views. The transition from one paradigm to another is a scientific revolution (Puchkova, 2005; Magsumov, 2019; Dunets et al., 2019; Titova et al., 2019; Thalassinos et al., 2013; Saenko et al., 2019).

In our opinion, the use of the paradigm concept allows us to introduce modern methodological tools of the philosophy of science into the research of the theory and practice of accounting and reporting.

According to T. Kuhn, paradigms determine the historical stages of science development (Lesnevskaya, 2009). In accordance with this approach, radical changes and transformations in the basic concepts and conceptual foundations of scientific theory, leading to a new picture of the explanation of the world, suggest a paradigm shift (Fedulova et al., 2019; Ivanova et al., 2019; Teles et al., 2019; Vertakova et al., 2019). Meanwhile, a certain continuity, overlap and coexistence of various paradigms can often be observed. Accordingly, “the transition from one paradigm to another is related to information capacity over time (more information is collected in less time). Each stage of the company’s development is characterized by its own system of accounting and reporting. As the company’s functioning becomes more complex, the accounting process becomes more complicated” (Solonenko, 2013).

In domestic science, the topic of accounting and reporting paradigms has received significant development. For the first time, accounting paradigms were announced by Ya.V. Sokolov. His classification of the stages of historical development of accounting was based on the idea of paradigm changes in the accounting methodology (unigraphic, desk and digraph paradigms), later the scientist identifies four accounting paradigms - naturalistic, desk, patrimonial accounting and double entry (Sokolov, 1996). Ya. V. Sokolov’s developments had a breakthrough character in the field of accounting methodology. The approach he proposed was developed in scientific discussions and developments regarding the further evolution of accounting and reporting. In particular, V. V. Kovalev understood the accounting paradigm as “scientific achievements” that “allow solving emerging problems of practical orientation” (Kovalev, 2013). Terentyeva T.O. formulated the principles of balance sheet items, defining the paradigms of financial statements (Tereneva, 2002). Shigaev A.I. introduced the concept of actuarial accounting as “accounting aimed at generating information necessary for existing and potential investors, lenders and other capital suppliers to assess the created economic value” (Shigaev, 2011), proposing a new accounting paradigm for the creation of a value-based management model. Scientists A.M.
Novikov, D.A. Novikov interpret the definition of a paradigm in the following context: “concept, theory, model of problem statement, adopted as a model for solving research problems” (Novikov, 2007).

The evolutionary development of accounting accelerated sharply at the beginning of the 20th century, when new objects and facts of economic life appeared (Singareddy et al., 2019; Arif and Hussain, 2018; Goryushkina et al., 2018). A number of them are still not clearly defined and are often not obvious from the point of view of evaluation, recognition and reflection in accounting and reporting. For example: corporate culture, contract system, organizational structure, leadership qualities of employees, etc. (Pankov, 2009). In the process of applying the dominant digraphic paradigm, the boundaries of the double-entry method are discovered (according to Kuhn’s terminology, “puzzles or anomalies”). In this regard, new paradigms are discussed that compete quite actively and successfully with the existing theory. Thus, O. A. Mironova, developing the theory of the institutional approach to accounting, notes that “accounting in our time begins to play a completely different role” (Mironova, 2011).

The difference in conceptual paradigms is based on the dominant approach to the theory and practice of accounting, which has developed in this organization or at the national level. Well-known American scientists E. S. Hendriksen and M. F. van Breda identified two groups in the aggregate of scientific approaches: a personalistic group that includes legal, tax, behavioral, and ethical accounting theories; and an economic (materialistic) group based on socio-corporate, microeconomic, and macroeconomic theories (Hendriksen, 1997).

These approaches are targeted on specific goals, focus on the interests of stakeholders, and build their information accounting system. As a result, the interpretation of the same fact of economic life can be carried out both from a legal and economic point of view (Sokolov, 2010), which affects the formation of a unified accounting methodology (Tsygankov, 2016). Each historical stage has its own accounting means, methods and techniques for preparing financial statements, and the content of accounting information (Korableva et al., 2019).

L. A. Tchaikovskaya made a significant contribution to the development of the paradigm concept in accounting. She believes that the formation of the concept of accounting in our country was mainly through revolutionary (perestroika) transformations (Tchaikovskaya, 2007). She presents a paradigmatic change in the concept of financial statements in the form of a sequence of stages, each of which has its own characteristics: genesis (origin); formation of financial reporting; financial reporting crisis; crowding out the old accounting paradigm.

3. Materials and Methods

As part of the research, the author analyzes the historical and logical stages of the financial reporting system formation in the Russian Federation. System analysis, empirical research, principles of formal logic, synthesis and analysis of theoretical and practical material were used as research tools.
4. Results

We are impressed by the idea of a paradigm approach presented in Figure 1, which should be developed in relation to the preparation of financial statements.

In our opinion, the proposed approach allows us to consider the paradigm logic of historical development and the formation of modern theories towards the creation of the institution of accounting financial statements and its alternative options in the form of so-called non-financial reporting.

![Diagram of a paradigm approach to the creation and preparation of financial reporting](source: Compiled by the authors)

Based on the paradigm approach, we have identified the scientific views of various eras, the laws of theory and practice of creating and preparing financial reporting at different stages of evolutionary development, their relationship to the development of the conceptual field in the information accounting environment. According to the research results, depending on the historical period, twelve evolutionary stages of reporting development were identified, which are presented in Figure 2.
<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
<th>Information Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-st stage</td>
<td>Origin (XVII–XIX centuries)</td>
<td>Peter I takes over foreign experience</td>
</tr>
<tr>
<td>2-nd stage</td>
<td>Establishment (1898–1917)</td>
<td>The knowledge of the content of the processes taken into account and the effectiveness of the accounting procedure led to the emergence of categories: balance sheet, profit, cost, production and circulation costs</td>
</tr>
<tr>
<td>3-rd stage</td>
<td>Stabilization and War Communism (1917–1921)</td>
<td>Transition to a machine-based technological basis. Development of various forms of business transactions and increasing the volume of both trade and financial transactions</td>
</tr>
<tr>
<td>4-th stage</td>
<td>New Economic Policy (NEP) (1921–1931)</td>
<td>Restoration of the traditional accounting system</td>
</tr>
<tr>
<td>5-th stage</td>
<td>The prewar and war years (1931–1945)</td>
<td>Industrialization, building socialism, creating new accounting principles</td>
</tr>
<tr>
<td>6-th stage</td>
<td>Building developed socialism (1945–1964)</td>
<td>Centralized accounting and reporting regulation</td>
</tr>
<tr>
<td>7-th stage</td>
<td>Stagnation period (1964–1985)</td>
<td>Improving production accounting, analyzing its organizational structures and disseminating mechanized processing of economic information</td>
</tr>
<tr>
<td>8-th stage</td>
<td>Pre-perestroika and perestroika periods (1985–1994)</td>
<td>The restructuring of all socio-economic relations in the country</td>
</tr>
<tr>
<td>9-th stage</td>
<td>The beginning of the reform (1994–1998)</td>
<td>Studying the content of international financial reporting standards. Analysis of possible options for reporting of Russian organizations in accordance with IFRS</td>
</tr>
</tbody>
</table>

**Figure 2.** The evolutionary stages of development of financial statements in Russia

*Source: Compiled by the authors*
For the purposes of developing a paradigm approach to the creation and preparation of financial reporting in Russian accounting practice, we also proposed the compilation of paradigm matrices of scientific knowledge of a total (general) and local (individual) nature. The construction of a total (general) matrix of scientific knowledge is based on accounting paradigms in the Russian Federation and types of reporting, the preparation of which is based on the formed view of the corresponding stage.

Within the framework of the paradigm matrix of scientific knowledge of accounting, a common information capacity is created that reveals the historical and logical sequence of development of the conceptual field, contributing to the interconnection of accounting paradigms and the use of scientific increments and innovations at each subsequent stage, as it is shown in Figure 3.

Local (individual) matrices of scientific knowledge will provide a generalization of the information field on the creation of certain types of reporting, which will allow to implement the concepts of its improvement in accordance with the theory of stakeholders and the requirements of the digital economy.

The use of the matrix approach in the paradigm concept of creating and preparing financial reporting will ensure the focus of research on the information field in the created accounting environment. The multi-level paradigm approach provides for a consistent study of the stages of creating scientific knowledge about the origin and formation of the financial reporting institution and its subsequent development.

To summarize the evolutionary stages presented in Figure 2, Table 1 presents the total (general) matrix of scientific knowledge on the creation and preparation of financial reporting.

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**Figure 3.** The total (general) matrix of scientific knowledge in the accounting environment for the creation and preparation of financial reporting

*Source: Compiled by the authors*
Table 1. The total (general) paradigm matrix of scientific knowledge in the accounting environment by stages of evolution

<table>
<thead>
<tr>
<th>Stage</th>
<th>Name</th>
<th>Term</th>
<th>Summary books and statements</th>
<th>Management Summary Reports</th>
<th>Financial Reporting</th>
<th>Consolidated Financial Reporting</th>
<th>Accounting and Financial Reporting</th>
<th>Accounting (financial) reporting</th>
<th>Financial Reporting according to IFRS</th>
<th>Consolidated reporting</th>
<th>Corporate reporting</th>
<th>Integrated corporate reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-st stage</td>
<td>Origin</td>
<td>(XVII-XIX centuries)</td>
<td>+</td>
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<tr>
<td>2-nd stage</td>
<td>Establishment</td>
<td>(1898-1917)</td>
<td>+</td>
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<tr>
<td>3-rd stage</td>
<td>Stabilization and War Communism</td>
<td>(1917-1921)</td>
<td>+</td>
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<tr>
<td>4-th stage</td>
<td>New Economic Policy (NEP)</td>
<td>(1921-1931)</td>
<td>+</td>
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<tr>
<td>5-th stage</td>
<td>The prewar and war years</td>
<td>(1931-1945)</td>
<td>+</td>
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<tr>
<td>6-th stage</td>
<td>Building developed socialism</td>
<td>(1945-1964)</td>
<td>+</td>
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<tr>
<td>7-th stage</td>
<td>Stagnation period</td>
<td>(1964-1985)</td>
<td>+</td>
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<tr>
<td>8-th stage</td>
<td>Pre-perestroika and perestroika periods</td>
<td>(1985-1994)</td>
<td>+</td>
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<tr>
<td>9-th stage</td>
<td>The beginning of the reform</td>
<td>(1994-1998)</td>
<td>+</td>
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<tr>
<td>10-th stage</td>
<td>Unification and standardization</td>
<td>(1998-2011)</td>
<td>+</td>
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<tr>
<td>11-th stage</td>
<td>Global convergence of accounting systems</td>
<td>(2011-2016)</td>
<td>+</td>
<td>+</td>
<td>+</td>
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<td></td>
<td>+</td>
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<td>+</td>
</tr>
<tr>
<td>12-th stage</td>
<td>Perspectives (Digital Economy)</td>
<td>(2016-until now)</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
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<td>+</td>
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</table>

*Source:* Compiled by the authors

The total (general) paradigm matrix of the relationship of scientific knowledge in the accounting environment characterizes their genesis in the development of accounting and reporting. Each subsequent paradigm is based on the knowledge of previous periods, thereby contributing to the creation of a new type of reporting.

**Discussion and Conclusion**

The results of the study indicate that the evolutionary process of the formation and reform of accounting (financial) statements in Russia should be considered as a complex, social phenomenon based on paradigmatic views on the theory and practice of accounting, a set of transformations in legal norms and economic relations. This process is associated with the development of an accounting methodology to meet the information needs of various users.

The paradigm approach to the evolution of financial reporting in Russia, developed by the authors, made it possible to identify the scientific views of different eras, the laws of theory and practice of creating and preparing financial statements at various stages of evolutionary formation, their relationship in creating a conceptual field in an information accounting environment. According to the results of the study, twelve evolutionary stages of reporting development are identified depending on the historical period.
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EUROPE 2020 STRATEGY AND ITS IMPLEMENTATION IN THE SLOVAK REPUBLIC

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Abstract. Since its inception, the European Union, as one of the most comprehensive and elaborate models of regional economic integration, has been striving to achieve a high degree of internal cohesion and natural convergence in the level of performance of individual national economies in its Member States as well as to maintain and improve its position as a major player in the complex geo-economics space of a globalized world economy. In order to achieve these key objectives, the European Union has been working since 2000 to implement large EU-wide strategies, one of which is the Europe 2020 strategy currently in place. The present article concentrates on the evaluation of the level of implementation of the Europe 2020 strategy in the conditions of the Slovak Republic in the context of analysis and evaluation of the level of fulfilment of individual objectives in the monitored time series.

Keywords: the European Union; world economy; economic and sustainable development; Europe 2020; the Slovak Republic


JEL Classifications: O1, O3, O4

1. Introduction

The European Union as one of the key actors (poles) of the world economy, especially in the external dimension of economic relations, seeks to effectively engage and establish wider economic relations with selected geo-economic partners in the form of national as well as forming and formed transnational economic complexes establishing an effective network of economic cooperation bringing benefits to all cooperating actors. By developing international economic cooperation as well as continuously deepening the economic integration of its internal space, the European Union seeks to fulfil one of its main strategic objectives aimed at maintaining and continuously strengthening its position in the globalized world economy. To fulfil this goal is within the framework of its interior, the European Union seeks to implement a number of different measures using a range of different groups of instruments. In the group of main measures with the most significant impact on the whole European integration area we can mainly include the so-called EU-wide strategies setting out the main objectives and priorities for further development for a limited period of time. At present, the European integration area is being implemented in the order of the second strategy defining the basic priorities and main objectives of the comprehensive and especially sustainable development of the European integration area called Europe 2020. The actual implementation process of the Europe 2020 strategy is based on monitoring and regular evaluation of priorities and objectives both at the level of the European Union as a whole and of individual national states.

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2. Theoretical background

The European Union, despite some problems, has without any doubt huge economic potential, which makes it a power of global influence. (Ivančík, 2019) Therefore, as one of the key player’s active in the globalized world economy, is striving in the long term to maintain its acquired position and to actively use its economic potential to initiate economic growth and increase competitiveness on a regional and global scale (Kovacova, 2013). Given the highly differentiated internal economic space of the European Union, it is essential to ensure the effective and efficient use of the economic potential of national economic complexes in such a way that these processes contribute to promoting economic growth and development of individual integrated national economic complexes and development of the EU transnational economic complex as a whole. In this area, the European Union has adopted a model for the implementation of strategies aimed at achieving sustainable economic growth in the constantly dynamically changing conditions of its internal and, in particular, its external economic space. The Europe 2020 strategy currently implemented is one of the key strategies aimed at initiating economic growth and development in the post-crisis period, which should reflect all the key dimensions of the sustainable development model (economic dimension, social dimension, ecological dimension). All three dimensions of the sustainable development model are reflected in the setting of the main priorities and consequently the individual strategic objectives, which are implemented by projects financed by the European Union, reflected in numerous publications (e.g. Monni et al., 2017; Prause, Atari, 2017; Monni et al., 2018; Iorio et al., 2018; Monni et al., 2019; Sarma et al., 2019; Bublienė et al., 2019; Rezk et al., 2019; Selivanova-Fyodorova et al., 2019; El Iysaouy et al., 2019; Prause et al., 2019). The implementation of the Europe 2020 strategy rests primarily on the nation states and the functionality of their economic complexes. Following the Europe 2020 headline targets defined at transnational level, at national level, the achievement of these targets is achieved through their implementation in national development strategies, in which case EU Member States have the option of identifying key targets by monitoring and forecasting future macroeconomic developments, as well as on the basis of an assessment of the real possibilities of the individual national economic complexes to effectively achieve these goals, the limits of these goals, which will be sought at national level by 2020. The Slovak Republic, as a Member State of the European Union, also strives to actively contribute to the achievement of the Europe 2020 goals. (Kavan, Brehovska, 2016) As mentioned above, the Slovak Republic has set its national limit values when setting the thresholds defined for individual Europe 2020 objectives. The implementation of the Europe 2020 strategy objectives in the Slovak Republic is implemented in close cooperation with other strategic objectives concerning various areas of economic and social practice (education, health, tax and levy, education system, economic performance, knowledge economy building, etc.) (Kavan, 2015) These objectives are contained in the basic strategic document National Reform Program. The National Reform Program is a fundamental strategic and planning document in the area and at the same time an open and dynamic document. This means that the level of achievement of each of the objectives set out in this document is monitored and evaluated on an annual basis and, based on a critical reflection and evaluation of the progress made so far, as well as the specific conditions under which the measures are implemented and measures that need to be implemented in this area.

3. Research objective and methodology

The research carried out, the partial results of which are presented in the present article, is focused on the study of selected factors determining both the transnational and selected national states the level and dynamics of the implementation of the Europe 2020 goals. the role of the Europe 2020 strategy in the context of its work as a key strategic document defining strategic objectives at the economic, social and environmental levels, which are essential pillars for creating a dynamic, developing, efficient, competitive and sustainable European Union multinational economic complex built on synergies and synergies similar principles of built and functioning national economic complexes. Various methods and procedures were used in the process of the research, the output of which is the submitted article. In particular, we consider a number of mathematical-statistical methods and procedures to be the most important ones in terms of setting the research objective for obtaining the necessary data and data. On this basis, the individual data and data were subsequently selected with respect to the defined time frame of assessment of the level of development of individual monitored indicators. These data
and data were then summarized and logically arranged on a defined timeline, and based on an assessment of the whole range of factors; these data were subsequently evaluated with an indication of expected development in the level of meeting the objectives pursued at the selected national state level.

3. Europe 2020 Strategy

In the framework of the Europe 2020 strategy, the main emphasis is placed on reiterating the basic effective functioning mechanisms, using various instruments enabling their effective functioning and bringing the expected positive effects in the form of initiating higher dynamics of economic growth supported by economic development. It is these two dimensions of economic growth, supported by a high level of development of individual sectors and retaliations, which should make a significant contribution to promoting and increasing the level of competitiveness at both regional and, above all, global level. The main concept of the Europe 2020 strategy is built on the definition of the three main priorities, each individually represents a fundamental pillar and the synergy of three main components of the model of sustainable economic development while preserving the necessary dynamics of economic performance and at the same time creating appropriate starting conditions for facilitating and increasing flexibility of the EU as the transnational economic complex as well as the Member States and their national economic complexes adapting to the dynamics of current global economic developments. The following have been selected and included in the Europe 2020 headline priority group:

- priority for smart growth
- a priority geared towards achieving sustainable growth;

In the area of priority focused on achieving smart growth, the main attention is focused on the need to implement changes in the applied models of economic growth and development focused on traditional approaches of the industrial era to the model of knowledge economy both nationally and transnationally. Concentrating attention on building a knowledge-based society and the knowledge-based economy, both at transnational and national level, is now a priority of major importance, both in terms of current and future projections of economic growth and development and the pursuit of pace and progress in this area, as well as in terms of projection of current and probable future development in the field of competitiveness both at national, regional and global level. Several currently carried out analyses aimed at identifying the main sources of economic growth and progress, as well as increasing the level of competitiveness at regional and global level, show that there are fundamental changes in the area compared to the previous period, which will be national and transnational economic complexes, if they want to succeed in increasingly intense competition, especially at global level, they have to adapt. These changes are related in particular to the shift in importance and the role of basic sources of competitiveness, which have shifted away from the traditional sources of competitiveness (land, labour, minerals, etc.) towards information and knowledge, and in particular their crucial role in the process. Creating and implementing innovation in individual sectors of the economy.

The second priority of the Europe 2020 strategy focuses on achieving sustainable growth. Under this priority, the need to rebuild the national economic complexes of the Member States and, in cooperation with the whole transnational economic complex of the European Union, to a more competitive and environmentally acceptable type of economy is underlined. In the long term, it can be pointed out that the European Union seeks to rebuild the applied economic growth model into a sustainable economic growth model while maintaining the necessary level of progress and extensive development (Ivančík, Nečas, 2017).

The third priority of the Europe 2020 strategy is to create efficient structures within the European Integration Area, which will not only contribute to increasing its economic growth, development and competitiveness, but also contribute to creating a type of society characterized by the high level of inclusion of its inhabitants, including in the case of various disadvantaged groups. This priority mainly affects the socio-economic dimension of the lives of EU citizens and individual Member States. This priority encompasses a wide range of areas related in particular to the effective prevention of poverty risk and the reduction of the EU population at risk of poverty and the associated social exclusion.
The identified, key priorities of the Europe 2020 strategy have found their expression and concrete definition in the form of the five core objectives that form the core of this strategy paper. A set of basic, five Europe 2020 objectives consist of: (Smarter, greener, more inclusive, 2018)

- the first objective is focused on increasing the employment rate of the EU population aged 20-64 to at least 75%. This objective also directly affects the need to achieve a higher employment rate of so called disadvantaged groups such as women, older workers, people with disabilities and people with reduced working capacity, as well as migrants;
- the second objective of the Europe 2020 strategy focuses on science and research, and in particular the progressive growth of investment in this field, with a view to achieving a level of science and research investment calculated as a share of at least 3% of total GDP by 2020;

The following two objectives are aimed at supporting core areas that are directly related to the fulfilment of the priority aimed at achieving smart growth, while closely linked to the other priority of the strategy aimed at promoting inclusive growth.

This group includes objectives aimed at:
- reducing the EU-population aged 18-24 who have dropped out of school or other forms of training to at least 10%;
- increasing the population of the EU aged 30-34 with a university degree to 40% (Smarter, greener, more inclusive, 2018).

The inclusion of these two strategic objectives suggests that the EU places a strong emphasis on the re-enactment of an educated, highly skilled and skilled workforce as a necessary element in building and effective functioning of the knowledge society and knowledge economy. (Kovacova, 2013) Achieving a higher level of professional qualifications enables individuals to better find themselves in the labour market and at the same time leads to a reduction of the risk of negative impacts related to the reduced ability to integrate into the labour market (long-term unemployment, low incomes, social dependence, etc.).

Within the Europe 2020 strategy, the priority focused on sustainable growth (Monni, Iorio, Realini, 2018) has been translated into three basic objectives, which can be described as forming an integral part of the so-called energy-environmental package. This group consists of objectives aimed at: (Smarter, greener, sea inclusive, 2018)

- setting up internal systems, implementing mechanisms and introducing new technologies to achieve significant greenhouse gas emission reductions of 20% (at a favourable development of 30%) compared to 1990 levels of greenhouse gas emissions;
- promoting and introducing new technologies and technological solutions to increase the share of energy produced from renewable sources in total final energy consumption by 20%;
- achieving at least 20% higher energy efficiency by 2020;

In order to achieve a higher level of inclusion for a highly educated and socially stratified European society, the Europe 2020 core objectives also included a target aimed at: (Smarter, greener, more inclusive, 2018)

- 25% reduction in the EU population at risk of poverty and social exclusion compared to the previous period.

Monitoring the level of progress achieved in meeting the Europe 2020 objectives, such as the coordination of the instruments of the Stability and Growth Pact and the Europe 2020 strategy, is implemented through a specific mechanism known as the European Semester. (Nečas, Andrassy, 2018) The European Semester represents a cycle that overlaps in time with the period of the first half of the calendar year concerned. Within this time period, individual Member States aim to ensure internal coordination and linkage between budgetary, macroeconomic and structural policies. Individual Member States can thus implement individual proposals and recommendations communicated from a transnational level into their economic strategies and adapt the draft state budget accordingly. The implementation of the proposed recommendations is under way between July
and December of the calendar year concerned. This period is referred to as the “national semester” (European Semester, 2018).

The Europe 2020 strategy itself foresees the need to use the resources of the EU’s internal potential efficiently in order to meet the objectives set. The main sources of EU internal potential that can be used to achieve the objectives are:

- a strong and efficient internal market - seeking to achieve greater connectivity and functionality;
- cohesion policy and its main instruments,
- the EU budget;
- use of funds from both public and private sources;
- effective use of EU external policy instruments (foreign trade policy). (Commission Communication, Europe 2020, 2010)

4. Implementation of the Europe 2020 Strategy in the Slovak Republic

The Slovak Republic, as an EU Member State, has implemented in its basic strategic documents aimed at defining the basic medium-term priorities and objectives in the area of economic activity based on the monitoring of the current situation and projection of expected macroeconomic development in the following periods. The values of the level of fulfillment of the Europe 2020 strategy objectives in the Slovak Republic for some objectives do not overlap with the targets set at the transnational level, which is related, as mentioned above, mainly with the expected outlook of macroeconomic trends and tendencies in the following period. Under the conditions of the Slovak Republic there is also an annual monitoring of the level of fulfillment of individual objectives defined in the key strategic documents. The level of achievement of the Europe 2020 objectives is monitored and evaluated on the basis of an established evaluation and control mechanism, referred to as the European Semester. In this section, we will therefore focus on assessing the state of play in meeting the individual targets set at national level on the basis of the Europe 2020 headline targets.

**Raising the employment rate of the EU population aged 20-64 years to at least 75%**

As mentioned in the previous sections of the text, the first of the top five objectives set out in the Europe 2020 strategy, which was implemented in the national, national strategic employment objectives of the Slovak Republic, is aimed at increasing the employment rate of the EU population aged 20-64 to 75%. (see Figure 1) On the basis of monitoring the development in the area of employment rate growth, the Slovak Republic set its national target of 72% within this target. In 2010, the employment rate of the population of the Slovak Republic in the age group 20-64 was 64.6%. Since 2011, however, we have seen annual progress in the development of this indicator, as documented by the following data. In 2011, the employment rate of the Slovak population in the age group of 20 - 64 years increased, while the employment rate reached the level of 65.0%. Between 2012 and 2014, there was a slow growth in the fulfilment of the target, while 2013 was a year of stagnation at 65.0%. In 2014, the employment rate of the Slovak population in the age group 20-64 increased by 0.9 percentage points to 65.9%. In 2015, progress was again recorded in the given area, with the rate of reported employment of the Slovak population in the age group 20-64 years reaching 67.7%. A similar positive development was recorded also in 2016 and 2017, when the Slovak Republic again recorded progress in the given area of 69.8% (2016) and 71.1% (2017). (National Reform Program of the Slovak Republic, 2017, 2017, National Reform Program of the Slovak Republic 2018, 2018)

In order to achieve the necessary dynamics in achieving the set national target aimed at increasing the employment rate of the population aged 20-64 to at least 72%, several measures have been adopted and implemented within the Slovak Republic. Of the wide range of these measures, we can mention only some selected, such as the Action Plan to Support the Integration of the Long-Term Unemployed into the Labour Market (launched in 2016). Following this, several mechanisms were implemented in 2017 to support the wider participation of the long-term unemployed in the labour market. In March 2017, the project entitled The Road to the Labour Market was implemented, aimed at effective reduction of long-term unemployment with a direct concentration
on districts, characterized by low dynamics of economic growth determined mainly by low level of internal, economic, development potential. One of the fundamental problems of these regions is also the relatively high rate of registered long-term unemployment as well as the unemployment of certain groups of the population, leading to an increased risk of poverty and social exclusion of these population groups. In the second half of 2017, another project called Restart - Opportunity for the long-term unemployed to return to the labour market was implemented in order to achieve more significant results in the area of reducing long-term unemployment. By the end of 2017, up to 1,907 persons from the target group were thus supported, long-term unemployed. (National Reform Program of the Slovak Republic 2018, 2018)

![Figure 1. Employment rate of EU citizens aged 20-64 in 2008 and 2017](Source: Smarter, greener, more inclusive, 2018)

**Increasing the share of investment in science and research to at least 3% of GDP**

We can also include in the group of objectives aimed at achieving smart growth the aim of achieving positive development in the area of progressively increasing the share of investment in science and research within the European integration area to at least 3% of GDP. (see Figrue 2) Under the conditions of the Slovak Republic, in view of the current development in this area, this value was set to 1.2% within this target. Monitoring the development of a given indicator on the basis of the set timeline from 2009 and 2010 up to the present time indicates that within the given target, in our conditions we record only a slight progress, which is determined by several factors. Based on the above, we can predict that the Slovak Republic will not meet the target of 1.2% of GDP. An attempt to gradually increase the share of investment in science and research and at the same time implement certain measures aimed at increasing the share of investment in science and research coming not only from public but especially private sources can be considered as positive in this area. (Selivanova-Fyodorova, N., Komarova, Lonska, Mietule, 2019)

The initial state of development of the volume of investments in the area of science and research showed that under the conditions of the Slovak Republic these expenditures are considerably undersized given the set priorities in the area of education and further training systems as well as in the area of research and development. In 2008, the volume of R&D expenditures in the Slovak Republic was 0.46% of GDP and in 2009 it was 0.47% of GDP. Since 2010 we have seen a slightly positive development in this area, which can also be documented by the progress of the indicator. In the period 2012 - 2014, the value of the monitored indicator of the share of investments in science and research ranged from 0.62% of GDP to 0.88% of GDP. In 2015 there was a one-off increase in the volume of investments in science and research to the level of 1.17%, mainly due to the draw-down of EU funds. In 2016, however, there was a disruption of the positive development trajectory in the given area, when the share of expenditure on science and research within the Slovak Republic reached 0.79% of GDP. In 2017, the volume of expenditure on science and research reached 0.88%. (National Reform Program of the Slovak Republic 2019, 2019)
As mentioned above, the achievement of a positive development in the form of a stronger progression in the growth of the volume of expenditure on science and research is determined by a number of different groups of factors. (Prause, Atari, 2017) In this context, we will only highlight the most important ones that need to be addressed in the short term. In particular, it is a more efficient and effective use of funds allocated from EU resources, especially in connection with the implementation of the settings of the Operational Program Research and Innovation. Attention should also be paid to the gradual application of the implementation plan of the Strategy for Intelligent Specialization of the Slovak Republic (RIS3), which has a direct link to the gradual launch and implementation of state programs aimed mainly at supporting science and research and R&D in 2018-2020. The purpose of the implementation of these programs should be to set up systemic measures aimed at promoting research and innovation beyond 2028. Further measures should be aimed at establishing an effective and efficient mechanism of support for public research and education institutions, not only within their traditional framework tasks in scientific research and educational activities, but especially in the area of creating suitable preconditions for the possibility of developing stronger links between research activity and practice so that the results of scientific research can be directly applied in practice. (Monni, S., Palumbo, Tvaronavičienė, 2017) Attention should also be paid to the area of international scientific research cooperation and thus increase the possibilities of access to the use of various grant schemes for their support.

**Figure 2.** Share of R&D expenditure in the EU and other countries in 2008-2016 (expressed as % of GDP)

*Source: Smarter, greener, more inclusive, 2018*

*Reducing the EU-population aged 18-24 who have dropped out of school or other forms of training to at least 10%*

The other Europe 2020 targets include an emphasis on reducing the 18-24-year-old EU population who dropped out of school or other forms of training to at least 10%.

Within this target, the Slovak Republic has set its national target at 6%. Developments within a given indicator can be documented as follows. In 2009, this indicator was 4.9%. Since 2011, however, we have seen a gradual increase in the values of the indicator aimed at monitoring the share of the population of the Slovak Republic aged 18-24 who had dropped out of school or other forms of training. In 2011, this indicator reached 5.1%, in 2012 it was 5.3%. In 2013, the monitored indicator increased to the declared level of 6.4%. Between 2014 and 2015, the monitored indicator recorded a slight increase again, reaching 6.9% in 2015. In 2017, the monitored indicator reached 9.3%. (National Reform Program of the Slovak Republic 2019, 2019) Based on the monitoring of the development trend in the area of the monitored indicator, the growth of values in this case is not associated with a favourable development in the given area. An early school leaving or other form of training brings with it a range of negative socio-economic impacts. Low levels of qualifications, expertise, skills and different competences disadvantage individuals in the labour market, reducing their competitiveness on the
labour market, which is usually reflected in their low social applicability and quite often leads to long-term unemployment, social dependence and hence social exclusion (see Figure 3).

In connection with the observed increase in the monitored indicator, the Slovak Republic has undertaken a whole range of reforms aimed at improving and improving education and training at all levels of the education system. (Vackova, Kovacova, Kancirova, Losoncz, 2016) In connection with the observed increase in the monitored indicator, the Slovak Republic has undertaken a whole range of reforms aimed at improving education and training at all levels of the education system. For example, we can mention the adoption of the document entitled National Program for the Development of Education, which is a strategic document integrating the long-term strategy and concept of the content of education at various levels and forms of education. Other measures have been implemented in this area, such as: reviewing expenditure on education, setting up measures to promote dual education, introducing measures to create an effective career guidance mechanism for pupils and students, and concentrating on increasing the social inclusion of pupils from social disadvantaged environment, streamlining the network of secondary education, harmonizing education at all levels of the system with the needs of practice, etc. (National Reform Program of the Slovak Republic 2019, 2019)

![Figure 3. The share of the EU population who left school early, or other forms of training in 2008 and 2017](#)

*Source: Smarter, greener, more inclusive, 2018*

*Increase in the EU population aged 30-34 who have completed university education to at least 40%*

The Group of Europe 2020 Strategy, implemented at national and transnational level, also included another objective aimed at promoting and improving education, as well as increasing the share of the educated and highly skilled workforce possessing the necessary knowledge and skills. This objective is primarily aimed at monitoring the development of the population of the EU aged 30-34 who have completed at least 40% of university education. In line with setting the target value at the supranational level, the Slovak Republic also set a target value of 40% within the target.

On the basis of monitoring the development of the indicator we can state that in our conditions we record positive development for individual monitored years, which is also documented by the following data. In 2009, the indicator of the population of the Slovak Republic, aged 30-34, who had completed university education was 17.6%. Since then, we have seen a gradual increase in the development of this indicator. In 2010, the value of this indicator reached 22.1%. In 2011, the value of this indicator reached the level of 23.2%. In 2012, it was already 23.7%. Between 2013 and 2014, the monitored indicator increased again to 26.9%. In 2015, the growth was 28.4% and in 2016 the growth of the indicator reached 31.5%. In 2017, the population of the Slovak Republic aged 30-34 years with completed university education reached 34.3%. (National Reform Program of the Slovak Republic 2019, 2019)
However, a positive development in the area of the monitored indicator must also be supported by a series of implemented measures. Based on a content analysis of selected strategic documents of the Slovak Republic aimed at supporting higher education, these documents point out that in the period up to 2020 it will be necessary to focus on: support of employees working in higher education (increasing their social and economic value, as well as the attractiveness of their profession), improving the quality and availability of education, increasing the proportion of students’ practical training, in particular in line with the needs of current social and economic practice.

The educated population possessing the necessary skills is now one of the cornerstones of our societal, political, social and economic development. (Ivančík, 2019) A highly qualified workforce is one of the main sources of new knowledge that underlies the processes of creating innovation applicable in various areas and aspects of life in contemporary societies (see Figure 4). Innovation is one of the main drivers of economic growth, the progress of individual economic sectors, and also of increasing competitiveness, not only at the regional but especially at the global level.

![Figure 4. Share of EU population aged 30-34 with university degree in 2008 and 2017](image)

*Source: Smarter, greener, more inclusive, 2018*

*Reducing greenhouse gas emissions by 20% compared to 1990 greenhouse gas emission levels*

Another group of objectives declared in the framework of the Europe 2020 strategy consists of objectives that are part of the so-called environmental-energy package and have a direct link to the main priority of the strategy aimed at achieving sustainable growth (see Figure 5).

The first of these targets is the 20% reduction target for greenhouse gas emissions compared to 1990 levels. As part of this goal, the Slovak Republic has set its national target value at 13%. By following the development of the given indicator in our conditions, we can state that we are quite successful in achieving this goal. In 2011, the GHG emission reduction level in our country was 0.8%. In 2012 and 2013, the GHG emission reduction was 4.5 - 4.6%. In 2014, the greenhouse gas emission reduction limit was reached at 10.5%. In 2015, this figure dropped slightly to 9.1%, but in 2016 it reached its 2014 level again, reaching 10.6%. In 2017, there was a stagnation in the development of the indicator aimed at monitoring the achieved level of reduction of greenhouse gas emissions, while the value of the monitored indicator was at the level of 2016. (National Reform Program of the Slovak Republic 2019, 2019)
Increase in the share of energy produced from renewable sources in total final energy consumption by 20%

The second objective, included in the target group of environmental energy package, is the objective aimed at increasing the share of energy produced from renewable sources in total final energy consumption by 20% (see Figure 6). Within this target, the Slovak Republic has set its national target value of 14%. As in the case of the previous target, in our conditions we succeed in meeting the set values, which can be documented on the development of the monitored indicator in individual years. In 2011, in our conditions the share of energy produced from renewable sources in total final energy consumption reached 10.3%. Between 2012 - 2013, the monitored indicator reached approximately the same value as in 2011. Since 2014, there has been a slight progress in the area, when the value of the indicator reached 11.7% and in 2015 12.9%. In 2016, we recorded a slight decrease in the value of the indicator aimed at monitoring the share of energy produced from renewable sources in the total final energy consumption, which reached the level of 12%. (National Reform Program of the Slovak Republic 2019, 2019)
Increase energy efficiency by at least 20%

The last of the three objectives forming an integral part of the objectives of the Europe 2020 Environment and Energy Package is the objective of increasing energy efficiency by at least 20% by 2020. (Rezk, Radwan, Salem, Sakr, Tvaronavičienė, 2019) Within this target the Slovak Republic has set a limit of 11%. As in the case of the previous two objectives, we are seeing progress in our conditions in meeting the energy efficiency target (see Figure 7). The development of this indicator is monitored on the basis of periodic evaluation and monitoring of changes in final energy consumption values compared with the average achieved in the years 2001 - 2005. (Sarma, Karnitis, Zuters, Karnitis, 2019) The results of realized comparisons show the following. In 2011, final energy consumption fell to 5.3% from the reference values. In 2012, the reduction was at 9.6%. In 2013, the value of the monitored indicator reached the level of 7.0%. In 2014 and 2015, the reduction in final energy consumption was between 12.3% (2014) and 11.4% (2015). In 2016, the reduction in final energy consumption in our conditions reached 8.8%. (National Reform Program of the Slovak Republic 2019, 2019)

As mentioned in the previous sections of the text, the Slovak Republic is experiencing a certain progress for all three objectives under the environmental energy package. In this context, however, it is also necessary to point out certain problem areas and bottlenecks that are closely linked to the issue. The main problem areas related mainly to the area of protection and preservation of healthy environment include: waste management, air quality, still relatively low level of waste recycling, waste separation, as well as negative impact of relatively high concentration of dust particles in air pollution. (Necas, Kollar, 2018) In this area, the Slovak Republic endeavours to seek and take relatively fundamental measures concerning these key areas of environmental protection. Among the wide range of strategic documents and measures and systems solutions declared there are, for example, the development and approval of the concept of the 2030 Environmental Policy Strategy, which focuses in particular on finding effective tools and avenues to avert and mitigate the negative impacts of major environmental challenges currently facing the Slovak Republic (air quality, waste management, forest protection and forestry). Other key strategy documents include the adoption of a Low Carbon Strategy aimed at identifying the potential and internal potential of individual economic sectors in the context of the need to reduce emissions by using the so-called “carbon economy”. A cost-effective approach with a view to 2050. A relatively essential document in this area is the Strategy of the Slovak Republic’s Adaptation to the Adverse Consequences of Climate Change. (National Reform Program of the Slovak Republic 2018, 2018)

25% reduction in the EU population at risk of poverty and social exclusion

The last of the Europe 2020 objectives is to emphasize the need to focus attention on reducing the EU’s population at risk of poverty and social exclusion by 25%. The evaluation of individual collected data shows that in 2011, 20.6% of the Slovak population were exposed to the risk of poverty and social exclusion. Gradually, this
share was reduced in the coming years. In 2012, the monitored indicator was 20.5%. In 2013 it was 19.8%. In 2014 and 2015 it stagnated at 18.4%. In 2016 it reached 18.1% and in 2017 it was 16.3%. (National Reform Program of the Slovak Republic 2019, 2019)

![Figure 8. EU population at risk of poverty and social exclusion in 2008 and 2016](source: Smarter, greener, more inclusive, 2018)

The results of an EU-level survey showed that within the European Integration Area, people at risk of poverty and social exclusion are most often confronted with three basic types of poverty (see Figure 8) (Harakalova, 2019) Financial poverty, which is one of the most widespread forms of poverty within the European Integration Area and threatens up to 17.3% (2016) of the European population, ranks first in this case. Another type of poverty is a material shortage, with up to 7.5% of Europe’s population exposed in 2016. (Prause, Tuisk, Olaniyi, 2019) Another type of poverty is poverty resulting from the low rate of remuneration of the work done, which is mainly related to low labour productivity resulting from the low or possibly insufficient level of qualifications, lack of necessary work skills, knowledge and competences. (Losonczi, 2014) In 2016, up to 10.5% were exposed to this type of poverty. (Smarter, greener, more inclusive, 2018)

4. Conclusions

In accordance with the setting of the Europe 2020 strategy goals, the Slovak Republic has implemented in its national strategy documents as one of the key tasks the fulfilment of these goals in connection with other long-term goals aimed at supporting the growth dynamics of economic growth and competitiveness on a transnational, regional and global level. As stated above, each EU Member State has set, based on the analysis of the current economic development, the basic target values of the level of fulfilment of the individual objectives declared in the Europe 2020 strategy, which it seeks to achieve effectively. In the case of the Slovak Republic, there was also a definition of the basic target values that it wants to achieve in case of fulfilling each goal of the Europe 2020 strategy. In this context, it can be pointed out that, for some selected objectives, the Slovak Republic maintained its national target value at the same level as set at EU level. The assessment of the level of fulfilment of the individual sub-objectives of the Europe 2020 strategy under the conditions of the Slovak Republic showed both positive development and progress in selected areas, but also revealed weaknesses in the process of implementation of the Europe 2020 strategy. A positive development was recorded in the area of employment rate growth of persons aged 18-24. A relatively positive development has also been observed in the area of meeting the target in increasing the number of people aged 30-34 who have completed university education. The Slovak Republic is gradually progressing also in the case of meeting the objectives of the so-
called environmental-energy package. On the other hand, the Slovak Republic has made very little progress in increasing the share of investment in science and research. In this area, we are comparatively lagging behind the EU average, and the area of science and research and its support today is one of the main objectives declared in several strategic documents as one of the key sources and engines of economic progress and support for increasing competitiveness. According to the surveys carried out nowadays, the group of the most competitive economies in the world includes mainly those that invest large amounts of funds in the area of support of science and research. Science and research are the main bearers of new ideas and knowledge, which are subsequently transformed into a range of innovations that can be used in different areas of life in contemporary societies and are thus initiators of the progress of society as a whole. It will therefore be necessary to pay increased attention to this area in the coming period, focusing in particular on putting into practice several measures and instruments that have only been declared. The process of implementing the objectives set out in the Europe 2020 strategy is carried out within the Slovak Republic in relation to other key objectives and despite the fact that in the case of meeting the selected objectives we have seen some progress in each of the identified areas it is necessary to introduce and implement a whole range of measures and system solutions so that progress in the level of fulfilment of individual strategic objectives is dynamic.

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Abstract. The authors have investigated the features of legal support for cybersecurity in some of the leading countries of the world, have established the organizational basis for its support, as well as the main aspects of NATO and the EU’s activities and standards in this area. In particular, the essence of the concept of cybersecurity is determined by referring to the views of both foreign scientists and Ukrainian scientists, and fixing this definition in normative documents of international importance (international standard ISO/IEC 27032:2012). Actual strategic goals in the direction of ensuring cybersecurity in countries such as France, the UK, the United States, as well as the settlement of these issues at the legislative level in Ukraine are highlighted. It has been established which state bodies operate in the indicated countries, whose powers include ensuring cybersecurity. Attention is paid to the settlement of cybersecurity and cyber protection issues at the international level, in particular at the EU and NATO levels. Particular attention is paid to NATO standards - TEMPEST. The content of the norms of the current legislation of Ukraine in the field of ensuring cybersecurity and the nature of the priority tasks of the National Cyber Security Coordination Center under the National Security and Defense Council of Ukraine are disclosed, which are normatively enshrined in the relevant Regulation. The features of the regulatory and organizational support of cybersecurity in some leading countries of the world and in Ukraine are structured.

Keywords: cyberspace; cybersecurity; cyber defense; TEMPEST.


JEL Classifications: F35, F42

1. Introduction

In recent years, the use of computer and telecommunication technologies has become widespread in various areas of human life, which is marked not only by positive changes in the transformation of social relations but also has led to new threats. The latter in the modern world is called “cyberthreats”, the existence of which causes significant damage to both the national security of individual countries and has reached a global scale.

The existence of new negative challenges of the information age suggests the need to neutralize them and therefore led to the emergence of the concept of cybersecurity. To date, ensuring cybersecurity is no longer limited to the creation of the information security system at a separate facility. Solving this issue requires the formation of a unified system of protection of potential threats to the country’s national security in cyberspace.
The development of strategic goals and the adoption of measures to ensure cybersecurity require the existence of an appropriate regulatory framework because they must be regulated at the legislative level. To this end, many countries of the world developed cybersecurity strategies that reflect not only the state’s priority goals in this direction but also possible ways of implementing such measures and expected results. Given the above, it seems relevant to study the features of the legal and organizational support of cybersecurity in individual countries, as well as NATO and EU standards in this area.

2. Literature Survey

The essence of the concept of cybersecurity is the object of study by both many foreign scientists and Ukrainian scientists. Thus, Kumar & Somani (2018) focuses on the fact that the cybersecurity points to both the uncertainty in this new space and the practice or procedures to make it (progressively) safe. This, in turn, points to a multitude of exercises and activities, both specialized and non-specialized, which, as it is expected, should provide the bioelectric state and the information that it contains and transport from all possible threats (Tvaronavičienė, 2018a; Korauš et al., 2019; Ključnikov et al., 2019; Vlasov et al., 2019).

Panchanatham (2015) notes that advanced technologies such as cloud services, mobile phones, e-commerce, that participate in these transactions contain the most sensitive and important information about users. Therefore, providing them with the necessary security is very important. Improving cybersecurity and protecting sensitive data and infrastructure are important to all countries, which is a first and foremost security (Tvaronavičienė 2018b; Lialina, 2019; Vigliarolo, 2020; Chehabeddine, Tvaronavičienė, 2020; Petrenko et al., 2019; Markopouloua et al., 2019).

Weiss et al. (2013) define cybersecurity as the management, development, management, and use of information security, and the protection of operational technologies (IT) and IT security means to achieve regulatory compliance, protect assets and compromise the assets of opponents.

Samuel & Osman (2014) point out the crucial role of cybersecurity in the field of data transfer technologies, the protection of which is the most difficult today. The main essence of cybersecurity, on which an important emphasis is placed, is associated with cybercrime, which is characterized by a rapid growth day by day.

According to Rus (2017), under a systemic approach, cybersecurity covers: (1) protection of electronic equipment; (2) data and information processing software. In terms of the concept, cybersecurity includes information security, it is extended to mobile devices and intelligent equipment, structured and unstructured information that it controls.

The enough interesting idea is expressed by the team of authors Galinec et al. (2017), who point out that cybersecurity is not:

(1) simply synonymous with information security, OT security, or IT security;
(2) the use of information security to protect the enterprise from crime.
(3) Cyberwar - although the definition of this term is still controversial. The consensus is that “cyberwar” means taking advantage of cybersecurity in the conditions of the war. This is a complex area and should not be confused with physical attacks on infrastructure (for example, destruction of property and equipment) and information war (for example, with the use of psychological operations using propaganda and disinformation).
(4) Cyberterrorism - like cyberwar, “cyberterrorism” refers to the use of cybersecurity techniques as part of the terrorist campaign or activity.
(5) Cybercrime is only an injured or pretentious term for criminal attacks using IT infrastructure. This is not related to cybersecurity.

Authors Panteleeva et al. (2019) believe that the concept of “cybersecurity” is complex, which in its essence combines the subject basis of cyberspace and the process functionality of the defense mechanism, relies on
systemic and institutional approaches, principles of efficiency, reliability, and optimality.

It is also necessary to focus on the fact that the concept of “cybersecurity” is not only researched and defined in the scientific refinements of scientists but also is enshrined in regulatory documents of international importance. In particular, in clause 4.20 of the international standard ISO/IEC 27032:2012 “Information technology - Security techniques - Cybersecurity guidelines”, the concept of “cybersecurity” is interpreted through the category “cyberspace security”, which refers to the confidentiality, integrity, and accessibility of information in cyberspace. The definition of cyberspace is contained in clause 4.21, which refers to a complex environment arising from the interaction of people, software and the Internet using technological devices and networks connected to it, which does not exist in any physical form (ISO/IEC 27032:2012 Information technology - Security techniques - Cybersecurity guidelines, 2012). In order to harmonize national Ukrainian legislation with international and European regulatory documents, DSTU ISO/IEC 27032:2016 “Information Technologies. Methods of protection. Cybersecurity guidelines”, which came into force on January 1, 2018.

3. Methods

The study of the concept of cybersecurity, the features of its legal support in some leading countries of the world, the definition of the organizational framework for ensuring cybersecurity, as well as the coverage of the main aspects of NATO and the EU’s activities in this area, were carried out using dialectic, comparative-legal, formal-legal, and system structural methods.

Using the dialectical method, the essence of the concept of “cybersecurity” was revealed by referring to the views of both foreign scientists and Ukrainian scientists.

The comparative-legal method made it possible to determine the legal framework on the specifics of ensuring cybersecurity in the leading countries of the world. In addition, the current strategic goals in this direction (for example, France, Great Britain, the USA), as well as resolving these issues at the legislative level in Ukraine, are highlighted.

Using the formal-legal method, the contents of the current legislation of Ukraine in the field of cybersecurity and the nature of the priority tasks of the National Cyber Security Coordination Center under the National Security and Defense Council of Ukraine are disclosed, which are normatively enshrined in the relevant Regulation.

Using the system-structural method, the analysis is carried out and the features of the regulatory and organizational support of cybersecurity in some leading countries of the world and in Ukraine are determined.

4. Results

Within the framework of the subject under study, it is necessary to determine what regulatory documents of the leading countries of the world have settled the issue of cybersecurity and what organizations operate in this area.

In France, for example, the 2011 French National Cyber Security Strategy is the founding document. The Strategy defines cybersecurity as the desired state of an information system in which it can withstand events from cyberspace that may compromise the availability, integrity or confidentiality of the data which are stored, processed or transmitted, and the related services that these systems offer or make available. Cybersecurity uses the methods of protecting information systems and is based on the fight against cybercrime and the establishment of cyber defense. In turn, cyberspace is defined as a communication space created through the worldwide interconnection of automated digital data processing equipment (Information systems defense and security - France’s strategy, 2011).
On October 16, 2015, the French National Digital Security Strategy, based on five strategic priorities, was announced by French Prime Minister Manuel Valls:

1. the main interests, defense, and security of state information systems and critical infrastructure, the most important operators of the economy and society, the big cybersecurity crisis;
2. digital trust, confidentiality, personal data, cyber identity;
3. raising awareness, primary education, continuing education;
4. digital business environment, industrial policy, export, and internationalization;

In France, the Agence nationale de la sécurité des systèmes d’information (ANSSI) is the government agency in the field of cyber defense and network and information security. To carry out its missions, ANSSI has launched a wide range of regulatory and operational activities, ranging from issuing regulations and verifying their application to monitoring, alerting and rapid response, especially in government networks. ANSSI maintains bilateral relations with numerous foreign agencies on every continent.

Following a multilateral approach, ANSSI works closely with the Ministry of Foreign Affairs and International Development (Ministère des Affaires étrangères et du Développement international (MAEDI) and the Ministry of Defense to define and promote French positions on political cybersecurity priorities (for example, the application of international law in cyberspace, the role of regional cybersecurity organizations, etc.). At the European Union (EU) and NATO level, ANSSI plays an important role through the National Communication Security Authority (NCSA) and the National Cyber defense Authority (NCDA). ANSSI is involved in providing communications to these organizations, ensuring that the EU and NATO have the necessary structures and resources to provide their own cybersecurity and support these organizations in their efforts to achieve this goal. ANSSI also represents France in the European Network and Information Security Agency (ENISA) and the National Liaison Officers (NLO) (The official website of ANSSI).

In 2013, many years of experience and cooperation with critical operators led ANSSI to propose to adopt a regulatory framework “Critical Information Infrastructure Protection (CIIP) Law”, which was promulgated on December 18, 2013. The law was proposed with the goal of establishing a common minimum cybersecurity level for all critical operators and enhancing ANSSI to support them in the event of a cyberattack. The law applies to more than 200 public and private operators from 12 sectors that are already recognized as critical in France. Security requirements will apply only to the most “critical information systems” of operators responsible for identification. The law provides for 4 main activities:

1. Incidents Notification - ANSSI directly informs operators of cases that occur in their critical information systems, protecting the confidentiality of operators;
2. Security Rules - ANSSI should establish technical and organizational rules, mainly basic cyber hygiene measures and common ones to all sectors;
3. Inspection - ANSSI may run security audits conducted by its services, another government agency, or a trusted service provider regularly or after an incident;
4. Major Crisis - ANSSI may introduce measures in the event of a major crisis announced by the Prime Minister. He establishes the legal basis for action under the crisis management plans (The French CCIP framework).

In April 2019, the French Military Cyber Strategy, consisting of two separate documents: the Public Elements for the Military Cyber Warfare Doctrine (hereafter the Public Elements) and the Ministerial Policy for Defensive Cyber Warfare (hereafter the Ministerial Policy), was introduced by the Minister of Armed Forces Florence Parly in France. The first of two documents containing the strategy of France is the Public Elements, which makes it possible to act on both the defense and offensive levels using cyber capabilities. The second document is the Ministerial Policy. Based on the recognition that cyber defense is a shared responsibility, the ministerial policy aims to better define the distribution of powers between the Ministry of Defense, its various structures,
and their industrial partners outside the government. The Chief of Defense Staff is responsible for defending the French Ministry of Defense against cyberthreats, and COMCYBER is responsible for its implementation. Together, these documents define the doctrine of the French Ministry of Defense (Ministère des Armées) on informative defense and offensive action, or on defense and offensive cyber warfare. The military cyber strategy, both its offensive and defense components, demonstrates a comprehensive approach to cyber defense, involving the entire French military industrial complex, including the Ministry of Defense (Delerue et al., 2019; Sitdikova & Starodumova, 2019).

Thus, in France, the Head of ANSSI is generally responsible in the field of the state’s cybersecurity, while the cyber defense commander (COMCYBER) is exclusively responsible for the cyber defense of the Ministry of Defense.

In the UK, the main regulatory document, the provisions of which are aimed at ensuring cybersecurity, is the National Cyber Security Strategy for 2016-2021. Clause 2.11 of Section 2 of the Strategy provides a definition of cybersecurity as protection of the information systems (hardware, software and related infrastructure), data about them and the services they provide against unauthorized access, damage, or misuse. Cyber security also includes damage caused by the system operator intentionally or accidentally due to non-compliance with security procedures (National Cyber Security Strategy 2016-2021, 2016).

The National Cyber Security Strategy is designed to shape government policies and offer a coherent and credible vision for sharing with the public and private sectors, civil society, academia, and the public. The strategy determines the proposed or recommended actions for all sectors of the economy and society, from the central government to the leaders of various industries and individuals.

It is also important to note that the National Cyber Security Strategy addresses cybercrime in the context of two interrelated forms of criminal activity:

1) cyber-dependent crimes - crimes that can only be committed with the help of information and communication technology (ICT) devices, where the devices are both a tool for committing a crime and a goal of a crime (for example, the development and distribution of bogusware for the purpose of financial profit, hacking to steal, damage, distortion or destruction of data and/or network or activity);
2) cyber-enabled crimes - traditional crimes that can be scaled up or expanded through the use of computers, computer networks, or other forms of ICT (for example, data theft) (National Cyber Security Strategy 2016-2021, 2016).

According to the National Cyber Security Strategy, the future vision until 2021 is that the UK is reliable and resilient to cyber threats, prosperous and confident in cyberspace. Such a vision involves the achievement of relevant goals in three directions, namely:

1) Protection - the availability of funds to protect the United Kingdom from developing cyber threats, an effective response to incidents and assurance of the protection and resilience of the UK networks, data, and systems.
2) Deterrence - The UK must be a difficult target for all forms of aggression in cyberspace, which is ensured by the identification, investigation, and deterrence of hostile actions taken against the country.
3) Development - the presence of an innovative, growing cybersecurity industry, supported by the world leading research and development (National Cyber Security Strategy 2016-2021, 2016).

In the UK, the Government Communications Headquarters (GCHQ) is active in cybersecurity and cyber defense. GCHQ provides intelligence, protects information, and informs relevant UK policy to keep society safe in the Internet age. GCHQ’s cybersecurity policy is to create an environment, in which the UK is considered a safe place to live and do business on the Internet. GCHQ activities are directed in three areas, namely:

1) collection - with strict observance of the current legislation, a number of methods are used to collect messages and data that are important;
(2) analysis - communications and data are analyzed to create intelligence reports;
(3) effects - the use of various Internet opportunities that can lead to a real world result (The official website of GCHQ).

The National Cyber Security Center (NCSC) was created in the GCHQ structure, which is aimed at establishing cooperation between the industry and the government by providing advice, guidance, and support on cybersecurity issues, including the management of cybersecurity cases. NCSC provides support to key UK organizations, the public sector, industry, and the general public. The NCSC is designed to respond effectively to the emergence of various cyber incidents in order to minimize damage to the UK. The NCSC’s cyber defense activities include cooperation with law enforcement, national defense, intelligence and security services in the UK and international partners (The official website of NCSC).

In order to strengthen cybersecurity in the country, the Cyber-Attacks (Asset-Freezing) Regulations were adopted on May 20, 2019, which provide for measures to freeze the funds and economic resources of all individuals and organizations listed in Appendix I of the Regulation, and to ensure that it is impossible to provide funds and economic resources to them or to their benefit (The Cyber-Attacks (Asset-Freezing) Regulations, 2019).

At a NATO Cyber Defense Conference held on May 23, 2019, Ciaran Martin (Head of the NCSC) noted in his report that the NCSC has already developed world-class methods to track the most threatening attack groups, tools, and techniques to counter them. At the same time, there are a number of activities that help make the Internet vulnerable automatically safe. It is important to focus attention on Ciaran Martin’s comments that the NCSC is a part of the GCHQ, and that is why success in the NCSC activities is achieved at the national level. As part of the international community, a cybersecurity alliance with NATO is very important. The NCSC strongly supports the full implementation of Cyber Defense Pledge 2016 (Ciaran Martin’s speech at the NATO Cyber Defense Pledge Conference, 2019).

In the United States, the legal cybersecurity principles are concentrated in the 2018 National Cyber Defense Strategy. The priorities of the National Cyber Defense Strategy include:
(1) protection of the homeland by protecting networks, systems, functions, and data;
(2) fostering America’s prosperity by developing a secure, prosperous digital economy and fostering strong domestic innovation;
(3) maintaining peace and security by enhancing the ability of the United States in collaboration with allies and partners to deter and, if necessary, punish those who use cyber tools for malicious purposes;
(4) expanding American influence abroad to expand the basic principles of an open, collaborative, reliable, and secure Internet (National cyber strategy of the United States of America, 2018).

Based on the analysis of the provisions of the National Cyber Defense Strategy, it is important to pay attention to the fact that, unlike the similar strategies in the field of cybersecurity in France and the United Kingdom, there is no definition of cybersecurity in it.

The Privacy and Civil Liberties Final Guidelines: Cybersecurity Information Sharing Act (2015) defines that the goal of cybersecurity is to protect an information system or information that is stored, processed, or transmitted through information systems against cybersecurity threats or security vulnerability. Cybersecurity threats are identified as actions that can lead to unauthorized efforts to adversely affect the security, accessibility, privacy, or integrity of the computer system (Privacy and Civil Liberties Final Guidelines: Cybersecurity Information Sharing Act (2015)).

As for the state body vested with authority in the field of cybersecurity in the United States, it is the Cybersecurity and Infrastructure Security Agency (CISA), which operates in compliance with the provisions of the Law on the Agency for Cybersecurity and Infrastructure adopted in 2018. The CISA coordinates security and resilience efforts using strong partnerships in the private and public sectors and provides technical assistance and evaluation to federal stakeholders, critical infrastructure owners and operators across the country. To ensure
cybersecurity among the main areas of CISA activities, it is necessary to highlight the following:
(1) the provision of free tools and resources for public and private partners;
(2) facilitating the assessment of the critical infrastructure vulnerability;
(3) enhancing safety and sustainability in the chemical sector;
(4) providing training, encouraging the exchange of information, and promoting industry partnerships and international engagement (Cybersecurity and Infrastructure Security Agency Act, 2018).

The CISA works with businesses, communities, and governments at all levels to make the country’s critical infrastructure more resilient to cyber threats (The official website of CISA).

The issue of cybersecurity is relevant not only at the national level of individual states but also at the international level. In particular, NATO and its allies rely on strong and sustainable cyber defense to fulfill the Alliance’s core tasks of collective defense, crisis management, and shared security. The Alliance must be prepared to defend its networks and operations against the growing complexity of cyber threats and attacks it faces (The official website of NATO). Among the main events in the field of cybersecurity, it is important to highlight the following ones:
(1) cyber defense is part of the key mission of NATO’s collective defense.
(2) NATO has confirmed that international law applies in cyberspace.
(3) NATO’s focus on cyber defense is to protect its own networks (including operations and missions) and increase resilience in the Alliance.
(4) In July 2016, the allies reaffirmed NATO’s defensive mandate and recognized cyberspace as a field of operations, in which NATO must defend itself as effectively as it does in the air, on land, and at sea.
(5) In July 2016, the allies also committed themselves to cyber defense in order to improve their cyber defense as a priority. Since then, all allies have improved their cyber defense.
(6) NATO reinforces its opportunities in the field of cyber-learning.
(7) Allies should strengthen the exchange of information and mutual assistance in preventing, mitigating, and recovering from cyberattacks.
(8) NATO cyber defense rapid response teams are ready to help allies 24 hours a day, if required and approved.
(9) At the Brussels summit in 2018, the allies agreed to create a new Cyberspace Operations Center as part of NATO’s strengthened team structure. They also agreed that NATO could use national cyber retaliation for its missions and operations.
(10) In February 2019, the allies approved NATO’s leadership, which contains a number of tools to further strengthen NATO’s ability to respond to significant harmful cyber activities.
(11) NATO and the European Union (EU) collaborate thanks to the cyber defense technical agreement, which was signed in February 2016. In light of the common challenges, NATO and the EU strengthen cooperation in the field of cyber defense, especially in the areas of information exchange, training, research, and exercises.
(12) NATO is stepping up cooperation with industry through a partnership in NATO’s cyber industry.
(13) NATO recognizes that its allies can take advantage of standards-based, predictable, and secure cyberspace (Cyber defense, 2019).

Responsibility for planning and conducting all cybersecurity lifecycle management activities is vested in the authority of the NATO Communications and Information Agency (NCI Agency) Cyber Security (CS) Service Line (SL). The cybersecurity service line provides specialized cybersecurity services covering a range of scientific, technical, and operational support throughout the life cycle of NATO’s information communications and technologies, and allows the Alliance to operate safely and securely. Cybersecurity provides for the provision of a wide range of services in such specialized areas of security: CIS security, cyber protection, information security, computer security, and communications security. When carrying out its duties, CS SL supports the development and implementation of the cybersecurity policy and strategy and provides lifecycle security risk management services for all NATO ICTs (The official website of NCI Agency).
In 2016, Cyber Defense Pledge was signed by NATO member countries. In accordance with this document, the heads of states and governments of the member countries of the Alliance assumed the obligation to ensure the security of the Alliance against cyber threats, as well as the possibility of their own protection in cyberspace. The work of the allies and the EU on enhancing cybersecurity, which helps to strengthen resilience in the Euro-Atlantic region, and further cooperation between NATO and the EU in the field of cyber defense are recognized as one of the priority areas. In addition, the member states affirmed the applicability of international law in cyberspace in the Cyber Defense Pledge. The role of NATO in promoting cooperation in the field of cyber defense, including through multinational projects, education, training, and the exchange of information to support national cyber defense efforts, is noted. Among the obligations of NATO member states, the following ones are enshrined in Cyber Defense Pledge:

1. To develop the fullest range of capabilities to protect national infrastructure and networks;
2. To allocate adequate resources at the national level to strengthen cyber defense capabilities;
3. To strengthen the synergy between relevant cyber defense stakeholders in order to deepen collaboration and share best practices;
4. To improve understanding of cyber threats, including the exchange of information and assessments;
5. To enhance the skills and knowledge of all defense stakeholders at the national level on fundamental cyber hygiene through sophisticated and reliable cyber defense;
6. To promote cyber education, training, and the fulfillment of forces, as well as strengthening educational institutions, building trust and knowledge in the Alliance;
7. To speed up the implementation of agreed cyber defense obligations, including for the national systems, on which NATO depends (Cyber Defense Pledge, 2016).

So, in 2018, NATO member states agreed on how to integrate the sovereign cyber effects, voluntarily provided by the allies, into the operations and missions of the Alliance, as well as create a Cyberspace Operations Center (CyOC). CyOC is responsible for information on cyberspace, centralized planning for cyberspace aspects of Alliance operations and missions, and coordination of cyberspace operational issues (Brent, 2019).

Today, NATO TEMPEST standards are world-famous in the field of cyber defense. TEMPEST deals with radiated electromagnetic waves of equipment (both radiated and conducted) and assesses the risk of eavesdropping. All electrical and electronic equipment generates electromagnetic radiation. In EMC, radiation from data processing equipment such as laptops or mobile phones contains sensitive information that is easy to intercept. In accordance with NATO TEMPEST standard, the so-called zones are defined - Zone 0, Zone 1, Zone 2 or Zone 3, and for which a standard for equipment test is required, which processes sensitive data in these rooms (Figure 1).

The European Union Agency for Cybersecurity (ENISA) has been operating in the European Union since 2004. ENISA works closely with member states and other stakeholders to provide advice and solutions, as well as improve their cybersecurity capabilities. It also supports the development of a joint response to large-scale cross-border incidents in the field of cybersecurity or crisis and has been developing cybersecurity certification schemes since 2019. The Regulation (EU) 2019/881 (Cybersecurity Act) establishes a European cybersecurity certification system for ICT products, services, and processes. ENISA is participating in this new structure, preparing candidate certification schemes at the request of the European Commission or the European Cybersecurity Coordination Group (member state delegation) (Regulation (EU) 2019/881).
LEVEL A – NATO SDIP-27
High level A is NATO’s most stringent standard, and therefore it is sometimes called “FULL”. Level A is applied to environments and equipment where immediate eavesdropping from an adjacent room (approximately 1 meter) can occur. Therefore, this standard applies to the equipment operating in the NATO zone 0.

LEVEL B – NATO SDIP-27
High level B is NATO’s next highest standard, also known as “IMMEDIATE”. This standard is applied to equipment, which is not heard at a distance of more than 20 meters. This “IMMEDIATE” standard is applied to equipment that operates in NATO Zone 1 and protects equipment both at 20 meters of unobstructed distance and at a comparative distance through walls and obstacles.

Level C - NATO SDIP-27
Temperature level C is also called “TACTICAL”. This standard is applied to environments and equipment in NATO Zone 2 (where eavesdropping can be possible at least 100 meters away). This standard protects equipment at 100 meters of unobstructed distance or comparable distance through walls and obstacles (What is the US NATO TEMPEST).

Figure 1. NATO ZONING (https://www.interelectronix.com/en/tempest.html)

The important role of standardization is caused by the following factors:
- there is a need for closer international cooperation to improve cybersecurity standards, including the need to define common standards of behavior, adopt codes of conduct, use international standards and exchange information, fostering faster international cooperation in response to the network and information security problems and promoting a joint global approach to such issues;
- European cybersecurity certification schemes should be non-discriminatory and based on European or international standards, if only these standards are ineffective or inappropriate to fulfill the Union’s legitimate goals in this regard;
- The EU certificate or declaration of conformity must contain technical specifications, standards, and procedures (Cybersecurity Standards and Certification, the official website of ENISA)

The ENISA strategy for 2016 - 2020 includes the following priority areas:
(1) to foresee and support Europe in solving new problems related to network and information security;
(2) to promote the network and information security as a priority of EU policies,
(3) to support Europe in supporting the advanced capabilities of the Network Information Service (NIS)
(4) to contribute to the formation of the European Community of the CIS;
(5) to enhance the effect of ENISA (Markopouloua et al., 2019).

In Ukraine, the concept of «cybersecurity» is defined by the legislator in the Law of Ukraine «On the basic principles of ensuring cybersecurity of Ukraine» dated October 5, 2017. In accordance with the clause 5 part 1 article 1 of the Law, cybersecurity means the protection of the vital interests of a person and citizen, society and the state when using cyberspace, which ensures the sustainable development of the information society and digital communication environment, timely identification, prevention, and neutralization of real and potential threats to the national security of Ukraine in cyberspace. Clause 7 part 1 Article 1 of the Law contains a definition of the concept of cyber protection as a combination of organizational, legal, engineering and technical measures, as well as measures of cryptographic and technical information protection aimed at preventing cyber incidents, identifying and protecting against cyberattacks, eliminating their consequences, and restoring the stability and reliability of communication and technological systems (Law of Ukraine on the basic principles of ensuring cybersecurity of Ukraine, 2017).
The Cyber Security Strategy of Ukraine, approved by the presidential decree of March 15, 2016 is currently in force. The priority areas of the Strategy include:

1. Elaboration and operational adaptation of state cybersecurity policies aimed at developing cyberspace, achieving compatibility with relevant EU and NATO standards,
2. Creation of a domestic regulatory and terminological base in this area, harmonization of regulatory documents in the field of electronic communications, information protection, information and cybersecurity in accordance with international and EU and NATO standards,
3. Formation of a competitive environment in the field of electronic communications, the provision of services for the protection of information and cyber defense;
4. Development of cybersecurity technologies for mobile communications, ensuring hardware, content security, and application and communication services security;
5. Attracting the expert potential of scientific institutions, professional and public associations to prepare projects of conceptual documents in the field of cybersecurity;
6. Improvement of the digital literacy of citizens and a culture of safe behavior in cyberspace, integrated knowledge, skills, and abilities necessary to maintain the goals of cybersecurity, implementing state and public projects to increase public awareness of cyber threats and cyber protection;
7. Conducting exercises on cyberspace emergencies and incidents;
8. Development and improvement of the system of state control over the state of information security, as well as the system of independent audit of information security, the implementation of international best practices and international standards on cybersecurity and cyber protection;
9. Development of electronic communications infrastructure, including broadband Internet access, digital and interactive television;
10. Development of a network of computer emergency response teams;
11. Creation of a system for the timely detection, prevention, and neutralization of cyber threats, including with the involvement of volunteer organizations;
12. Development and improvement of the technical and cryptographic information protection system;
13. Development of international cooperation in the field of cybersecurity, support of international initiatives in the field of cybersecurity that are in line with the national interests of Ukraine, deepening cooperation between Ukraine and the EU and NATO to strengthen Ukraine’s capabilities in the field of cybersecurity, participation in OSCE-sponsored cyberspace confidence-building activities;

It is important to note that the working body of the National Security and Defense Council of Ukraine in the field of cyber defense is the National Cyber Security Coordination Center, which operates in accordance with the Regulation. The priority tasks of the National Cyber Security Coordination Center include:

1. Analysis: cybersecurity status; results of a review of the National Cyber Security system; the state of readiness of cybersecurity entities to fulfill the tasks of countering cyber threats, implementing measures to prevent and combat cybercrime;
2. Participation in the development of industry cybersecurity indicators;
3. Forecasting and identifying potential and real threats in the field of cybersecurity of Ukraine;
4. Development of conceptual principles and proposals for ensuring state cybersecurity;
5. Synthesis of international experience in the field of cybersecurity;
6. Participation in ensuring the development and implementation by cybersecurity entities of information exchange mechanisms necessary for organizing a response to cyber attacks and cyber incidents, eliminating their causes and consequences;
7. Operational, informational, and analytical support of the National Security and Defense Council of Ukraine on cybersecurity issues.
(8) developing and submitting proposals to the National Security and Defense Council of Ukraine, its Chairperson, in accordance with the established procedure, on defining Ukraine’s national interests in the field of cybersecurity;

(9) monitoring the development and implementation of national standards and technical regulations for the use of information and communication technologies, harmonized with EU and NATO standards;

(10) the elaboration of issues to determine the ways, mechanisms, and methods for resolving problematic issues that arise during the implementation of state policy in the field of ensuring cybersecurity;

(11) participation in ensuring the monitoring of the implementation of decisions of the National Security and Defense Council of Ukraine on cybersecurity of the state, enforced by decrees of the President of Ukraine;

(12) study of international experience in the creation and functioning of National Cyber Security systems, its distribution among organizations and institutions in accordance with its competence, monitoring of its implementation in Ukraine;

(13) participation in the organization and conduct of interethnic and interdepartmental cyber-learning and training in the field of cybersecurity, the development of relevant methodological documents and recommendations (Regulations on the National Cyber Security Coordination Center, 2016).

Thus, on the basis of the study conducted, it is possible to formulate regulatory and organizational support in the leading countries of the world and Ukraine in the corresponding table (Table 1).

<table>
<thead>
<tr>
<th>Country</th>
<th>Regulatory support (basic regulatory documents)</th>
<th>Organizational support (state authorities)</th>
<th>Strategic goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>1. The French national digital security strategy (2015)</td>
<td>Agence nationale de la sécurité des systèmes d’information (ANSSI)</td>
<td>(1) the main interests, defense, and security of state information systems and critical infrastructure, the most important operators of the economy and society, the big cybersecurity crisis;</td>
</tr>
<tr>
<td></td>
<td>2. French Military Cyber Strategy (2019): the Public Elements for the Military Cyber Warfare Doctrine (the Public Elements) and the Ministerial Policy for Defensive Cyber Warfare (the Ministerial Policy)</td>
<td>(2) digital trust, confidentiality, personal data, cyber identity;</td>
<td>(2) digital trust, confidentiality, personal data, cyber identity;</td>
</tr>
<tr>
<td></td>
<td>3. Critical Information Infrastructure Protection (CIIP) Law (2013)</td>
<td>(3) raising awareness, primary education, continuing education;</td>
<td>(3) raising awareness, primary education, continuing education;</td>
</tr>
<tr>
<td></td>
<td>2. The Cyber-Attacks (Asset-Freezing) Regulations (2019)</td>
<td>(1) Protection - the availability of funds to protect the United Kingdom against developing cyber threats, the effective response to incidents and assurance of the protection and resilience of the UK networks, data, and systems.</td>
<td>(2) Deterrence - The UK must be a difficult target for all forms of aggression in cyberspace, which is ensured by the identification, investigation, and deterrence of hostile actions taken against the country.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(3) Development - the presence of an innovative, growing cybersecurity industry, supported by world-leading research and development.</td>
<td>(3) Development - the presence of an innovative, growing cybersecurity industry, supported by world-leading research and development.</td>
</tr>
<tr>
<td>United States</td>
<td>Ukraine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td>----------------</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3. Regulations on the National Cyber Security Coordination Center (2016) |
| Cybersecurity and Infrastructure Security Agency (CISA) | The National Cyber Security Coordination Center is a working body of the National Security and Defense Council of Ukraine |
| (1) protection of the homeland by protecting networks, systems, functions, and data;  
(2) fostering America’s prosperity by developing a secure, prosperous digital economy and fostering strong domestic innovation;  
(3) maintaining peace and security by enhancing the ability of the United States in collaboration with allies and partners to deter and, if necessary, punish those who use cyber tools for malicious purposes;  
(4) expanding American influence abroad to expand the basic principles of an open, collaborative, reliable, and secure Internet. | (1) elaboration and operational adaptation of state cybersecurity policies aimed at developing cyberspace, achieving compatibility with relevant EU and NATO standards,  
(2) creation of a domestic regulatory and terminological base in this area, harmonization of regulatory documents in the field of electronic communications, information protection, information, and cybersecurity in accordance with international and EU and NATO standards,  
(3) formation of a competitive environment in the field of electronic communications, the provision of services for the protection of information and cyber defense;  
(4) development of cybersecurity technologies for mobile communications, ensuring hardware, content security, and application and communication services security;  
(5) attracting the expert potential of scientific institutions, professional and public associations to prepare projects of conceptual documents in the field of cybersecurity;  
(6) improvement of the digital literacy of citizens and a culture of safe behavior in cyberspace, integrated knowledge, skills, and abilities necessary to maintain the goals of cybersecurity, implementing state and public projects to increase public awareness of cyber threats and cyber protection;  
(7) conducting exercises on cyberspace emergencies and incidents;  
(8) development and improvement of the system of state control over the state of information security, as well as the system of the independent audit of information security, the implementation of international best practices and international standards on cybersecurity and cyber protection;  
(9) development of electronic communications infrastructure, including broadband Internet access, digital and interactive television;  
(10) development of a network of computer emergency response teams;  
(11) creation of a system for the timely detection, prevention, and neutralization of cyber threats, including with the involvement of volunteer organizations;  
(12) development and improvement of the technical and cryptographic information protection system;  
(13) development of international cooperation in the field of cybersecurity, support of international initiatives in the field of cybersecurity that are in line with the national interests of Ukraine, deepening cooperation between Ukraine and the EU and NATO to strengthen Ukraine’s capabilities in the field of cybersecurity, participation in OSCE-sponsored cyberspace confidence-building activities;  
(14) creation of the conditions for the introduction of modern cyber defense technologies in Ukraine |
5. Discussion

In the modern world, one of the priorities in ensuring the national security of the state is the formation of the cybersecurity policy. This is explained by the fact that with the development of information and communication technologies, the emergence of new threats in cyberspace, called cyber threats, became inevitable.

That is why the effectiveness of the normative and organizational support of cybersecurity in any country is an indicator of its ability to withstand the cyber threats that exist in cyberspace and take various forms every day.

Achievement of the desired cybersecurity level in a given country is seen to be effective, provided that there is both coordination between national government bodies that are vested with the relevant authority in this area and at the level of interstate ties. In particular, in the context of European integration for Ukraine, the urgent strategic goal of ensuring cybersecurity is the harmonization of regulatory documents with international and EU and NATO standards.

Conclusions

According to the results of the study, it should be noted that in many leading countries of the world, cybersecurity systems of national importance have already been formed and are functioning.

So, in France, the Agence nationale de la sécurité des systèmes d’information (ANSSI) acts as the state body in the field of cyber defense and network and information security. To carry out its missions, ANSSI has launched a wide range of regulatory and operational activities, ranging from issuing regulations and verifying their application to monitoring, alerting, and rapid response, especially in government networks.

In the UK, the Government Communications Headquarters (GCHQ) actively operates in the area of cybersecurity and cyber defense, which provides intelligence, protects information, and informs relevant UK policies to keep society safe in the Internet age. Moreover, the National Cyber Security Center (NCSC) was created in the GCHQ structure, which is aimed at establishing cooperation between industry and the government by providing advice, guidance, and support on cybersecurity issues, including the management of cybersecurity cases.

In the United States, the legal framework for cybersecurity is concentrated in the 2018 National Cyber Security Strategy, and the Sybersecurity and Infrastructure Security Agency (CISA) acts as the government agency with powers in cybersecurity, which operates in compliance with the relevant laws of the agency.

The issue of cybersecurity is relevant not only at the national level of individual states but also at the international level. In particular, NATO and its allies rely on strong and sustainable cyber defense to fulfill the Alliance’s core tasks of collective defense, crisis management, and shared security.

Responsibility for planning and conducting all cybersecurity lifecycle management activities is vested in the authority of the NATO Communications and Information Agency (NCI Agency) Cyber Security (CS) Service Line (SL). Today, NATO TEMPEST international standards are world-famous in the field of cyber defense. The European Union Agency for Cybersecurity (ENISA) has been operating in the European Union since 2004, which works closely with member states and other interested parties to provide advice and solutions, as well as improve their cybersecurity capabilities.

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RISK MANAGEMENT, SUSTAINABLE GOVERNANCE IMPACT ON CORPORATE PERFORMANCE

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Abstract. The first objective of this study is to examine the relationship between the size of the Board of Directors and audit committee on the company’s financial performance; the second is to test the size of the Board of Directors and the audit committee on the implementation of Enterprise Risk Management (ERM); the third is to examine the relationship of the application of ERM on the company’s financial performance; and fourth is to test the relationship of the size of the Board of Directors and the audit committee on the company’s financial performance when mediated by the adoption of ERM. The research sample is 70 firm-years Indonesian non-financial companies listed during 2013-2016. Structural equation Modeling (SEM) with the WarpPLS approach has been used for data analysis. The results showed that the size of the Board of Directors affected the company’s financial performance, while the size of the audit committee did not affect the financial performance. The size of the Board of Directors and the audit committee influence the implementation of ERM. The application of ERM affects the company’s financial performance. The application of ERM mediates partially the relationship between the size of the Board of Directors and the company’s financial performance, but the application of ERM does not mediate the relationship between the size of the audit committee and the company’s financial performance. The results of the study have implications for agency theory and resource dependence theory where a large Board of Directors is a solution to the problem of resources for supervision in improving organizational performance through the effective implementation of ERM.

Keywords: Company Financial Performance; Enterprise Risk Management; Board of Directors; Audit Committee.


JEL Classifications: M14, M41, M49

1. Introduction

The company’s main goal is to increase the prosperity of shareholders. Management is always required to achieve certain performance standards as outlined in the performance contract. Business competition requires management to achieve performance above the industry average, therefore competitive advantage is needed to enable companies to compete in a demanding business environment. On the other hand, management’s efforts to reach the agreed performance contract will always be accompanied by risk, the higher the target of achieving the desired performance by the company, the higher the level of risk exposure that will be faced. Various cases experienced by large companies such as Enron, WorldCom, Global Crossing, and Adelphia are examples of company failures in risk management. Reflecting on these failures, management must be able to implement an effective risk management system. The approach that is believed to be able to mitigate risk and manage risk holistically is by implementing Enterprise Risk Management (ERM). ERM is a new paradigm dealing with organizational risk that enables policymakers to focus on ways to improve risk management comprehensively with a holistic approach that goes beyond traditional silo-based risk management techniques (Beasley et al., 2005; Gordon et al., 2009; Viscelli et al., 2016; Petrenko et al., 2017; Suray et al., 2019; Nasr et al., 2019;
Havierníková, Kordoš, 2019; Kordík, Kurilovská, 2019; Tarasova et al., 2018; Masood et al., 2019; Chehabed-dine, Tvaronavičienė, 2020; Lincényi, Čársky, 2020), by using risk appetite, to determine risks that must be accepted, risks that must be reduced and risks that must be avoided by companies (Pagach and Warr, 2010). Recent developments in Corporate Governance have made ERM a key component of companies’ management because the application of ERM is believed to be able to realize the company’s goals in the long run and can be used as a tool to monitor agent performance by principals. Schroeck (2002) and Mafrolla et al. (2016) state that the application of ERM can overcome or reduce agency problems and improve company performance. Some researchers have proven that ERM can improve company performance such as Gordon et al. (2009), Hoyt and Lybenberg (2011), Florio and Leoni, (2016), but the opposite evidence, namely that ERM does not affect company performance, was found by Pagach and Warr (2010). While several other researchers have identified that the implementation of ERM is determined by many factors such as internal governance factors, namely the Board of Directors and audit committee. Desender (2007) argues that a large Board of Directors size adds opportunities to exchange information and expertise, thereby increasing the quality of ERM implementation. This is supported by the resource dependence theory according to which the most common solution to the inherent problems of the organization lies in the interdependence of resources to increase supervision that benefits each other’s sources (Pfeffer and Salancik, 1978). Furthermore, Beasley et al. (2005) show that audit committees improve the quality of supervision over the implementation of ERM to reduce fraud and opportunistic behaviour of managers. On the other hand, empirical evidence first shows that the implementation of corporate governance can improve company performance, such as Belkhir (2009), Husaini and Saiful (2017), and Echeverri et al. (2019) who concluded that the size of a large Board of Directors can improve company performance. Likewise, the results of research undertaken by Reddy et al. (2010), Oradi et al. (2017), and Chiu, et al. (2019) revealed that the existence of an audit committee can reduce agency conflicts and improve company performance. Based on the argument above, this shows that there is a direct and indirect relationship between the size of the Board of Directors and the audit committee on the company’s financial performance. Second, it provides support to agency theory and resource dependence theory (Suryani, 2018). Third, it adds empirical literature for the model of the application of ERM in Indonesia.

2. Literature Review

2.1 Corporate Governance and Company Financial Performance

Corporate governance has become an important pillar in ensuring the success of the company to remain sustainable. The Board of Directors and the audit committee are important mechanisms within this pillar. Agency theory indicates that a strong Board of Directors can reduce agency conflict and can align the interests of agents with the interests of the principals. In this case, the size of the Board determines the quality of supervision, especially in improving company performance. Jensen (1993) explains that companies with a slim board size will be more effective in carrying out supervision. In contrast, resource dependency theory supports the existence of large board sizes (Yahya & Ghazali, 2017), where large board sizes guarantee the availability of external resources, enable the elaboration of knowledge, and the availability of skills that can strengthen the organization (Dalton et al., 1999). Several studies have confirmed the relationship between the Board of Directors size and company performance, showing that a large Board of Directors size can improve company performance (Belkhir, 2009; Husaini and Saiful, 2017; Echeverri et al., 2019). Based on the above review the first hypothesis of this study is as follows.

H1: The Board of Directors positively influences the company’s financial performance.

The audit committee is a sub-committee of the Board of Directors as an important monitoring mechanism in corporate governance. The main function of the audit committee is to protect the interests of shareholders through financial supervision, internal control, the audit process, and risk management practices (Klein2002). Research on the relationship between audit committee and company performance shows that there is a signifi-
cant positive relationship between audit committee and company performance despite using different proxies to measure performance, such as Oradi et al. (2017) proxied performance with ROA and Tobin’s Q. Likewise the research of Chiu, et al. (2019) examined the voluntary adoption of audit committees on Tobin’s Q, return on assets, and idiosyncratic risk, showing that audit committees, especially those controlled by families, enjoy better performance and lower risk (Kristanti, 2019). Chiu, et al. (2019) concluded that voluntary audit committee adoption can reduce agency conflicts and asymmetric information. Furthermore, the results of research by Reddy et al. (2010) concluded that large audit committees are more effective than smaller committees and help improve company performance. Therefore, the second hypothesis is as follows.

**H2: The audit committee has a positive effect on the company’s financial performance.**

### 2.2 Corporate Governance and Enterprise Risk Management

As a pillar in the corporate governance of companies, the Board of Directors and audit committees have an important role in the company’s supervision system, especially in overseeing the accuracy of the ERM implementation approach by management, including determining the company’s risk appetite. Desender (2007) argues that a large number of board members add opportunities to exchange information and expertise, thereby increasing the quality of ERM. The results of the study of Wan Daud et al. (2011) show that there is a positive correlation between the quality of the Board of Directors at the level of ERM adoption in Malaysia. Gordon et al. (2009) concluded that the relationship between monitoring by the Board of Directors and the adoption of ERM is determined by the suitability of the ERM program and the level of monitoring by the Board of Directors. Based on the above thought, the third hypothesis is as follows.

**H3: The Board of Directors has a positive effect on the application of Enterprise Risk Management.**

On the other hand, the complexity of the risks faced by companies has resulted in changing the role of the audit committee which needs to add ERM to its agenda, thereby increasing its responsibilities (Burton, 2008). The audit committee is given explicit responsibility for overseeing ERM practices (Beasley, 2010; Viscelli et al., 2016), focusing on the challenges of the overall risk profile (Demidenko and McNutt, 2010), and has a coordinating system with the Board of Directors, management and auditors relating to risk management and financial reporting (Turley & Zaman, 2004). This supervision allows the Board of Directors or managers to take risk mitigation strategies to maintain the effectiveness of the company’s operations (Allini et al., 2016). The results of research conducted by Gottwald and Mensah (2015) show that there is a significant relationship between the existence of the audit committee and the level of ERM implementation. Likewise, the results of Husaini and Saiful (2019) show that the audit committee is one of the determinants of the effectiveness of the implementation of ERM in the banking industry in Indonesia (Arniati, 2019). Therefore, the fourth hypothesis is as follows.

**H4: The audit committee has a positive effect on the implementation of Enterprise Risk Management.**

### 2.3 Enterprise Risk Management and Company Financial Performance

According to Beasley et al. (2005), the application of ERM is a means to promote the company’s operational performance and assist in making strategic decisions. ERM provides benefits for companies, such as reducing direct and indirect costs related to company finances, so that the application of ERM will affect revenue, namely by reducing variability through control of risk at the cost center and source of income. Therefore, the application of ERM improves performance because it helps companies to avoid loss, bankruptcy and reputation costs (Gordon et., 2009; Pagach and Warr, 2010). Lai and Samat (2011) conducted research using survey methods on 128 companies listed on the Malaysian stock exchange, the results of the study found that the implementation of ERM had a positive association in reducing the costs of financial difficulties (Firnanti, 2019), lowering external financing, improving the company’s credit rating, obtaining rewards from the equity market, reduce information asymmetry, and reduce agency problems. Schroock (2002) indicates that the application of ERM can reduce agency costs in the form of monitoring costs and improving company performance. Some research
shows that the application of ERM can improve both financial performance and market performance of companies, such as the results of research conducted by Florio and Leoni (2016), Silva et al. (2018), Kommunuri et al. (2015); Hoyt and Lybenberg (2011), and Gordon et al. (2009). Research in Indonesia by Husaini and Saiful (2017) shows results that are consistent with some previous studies that the application of ERM can increase company value. However, some researchers found different results such as Pagach and Warr (2010) and Quon et al. (2012) who concluded that the application of ERM did not affect the company’s financial performance. Based on the description above, the fifth hypothesis is as follows.

**H5: The application of Enterprise Risk Management has a positive effect on the company’s financial performance.**

### 2.4 Corporate Governance, Enterprise Risk Management, and Company Financial Performance

Resource dependency theory states that resources can strengthen an organization (Dalton et al., 1999), thus a large Board of Directors and audit committee size can improve organizational performance. Some research results show there is a positive relationship between the Board of Directors size and company performance, for example, the research undertaken by Belkhir (2009), Husaini and Saiful (2017) and Echeverri et al. (2019). Furthermore, the effective application of ERM requires optimal supervision. The Board of Directors and audit committee have the competence to oversee the accuracy of the ERM implementation approach. Desender (2007) and Wan Daud et al. (2011) concluded that there was a positive relationship between the Board of Directors and the implementation of ERM, as well as the results of research by Gottwald and Mensah (2015) and Husaini and Saiful (2019) showed a positive relationship between the existence of the audit committee and the implementation of ERM. Furthermore, several studies have also shown that the application of ERM can improve company performance (Florio and Leoni, 2016; Silva et al., 2018; Kommunuri et al., 2015; Hoyt and Lybenberg, 2011; Gordon et al., 2009; and Husaini and Saiful, 2017). Based on several previous studies, there are indications that the influence of the Board of Directors and audit committees on company performance can be influenced directly and indirectly, or can be mediated, by ERM. Therefore, the sixth and seventh hypotheses are as follows.

**H6: Implementation of Enterprise Risk Management mediates the relationship between the Board of Directors and the company’s financial performance.**

**H7: The application of Enterprise Risk Management mediates the relationship between the audit committee and the company’s financial performance.**

### 3. Research Methodology

#### 3.1 Population, Sample and Data Source

The population of this study is non-financial companies listed on the Indonesian Stock Exchange (IDX). Purposive sampling technique resulted in obtaining 670 observations during 2013-2016. This study uses secondary data, namely annual reports and financial reports obtained on IDX websites and the websites of each listed non-financial company.

#### 3.2 Variable, Measurement and Model

The dependent variable in this study is the company’s financial performance. The company’s financial performance (CFP), measured by the ratio of ROA\(_{t+1}\) and ROE\(_{t+1}\), is a measure of the company’s effectiveness in generating future profits by utilizing its assets and equity. The independent variable consists of; 1) Board of Directors (BC), measured by the number of Board of Directors of the company and 2) audit committee (AC) measured by the number of audit committees. Then the mediating variable is Enterprise Risk Management.
(ERM) measured by the number of disclosures for each ERM component as an indicator, consisting of: internal environment (IE), objective setting (OS), event identification (EI), risk assessment (RA), risk response (RR), control activities (CA), information and communication (IC), and monitoring (MG). This study also includes the variables of sales growth (SG), asset growth (AG), company size (SZ) and Leverage (LV) in the research model to control the relationship of the dependent variable and the independent variable. This research model was developed based on several previous studies such as Gordon et al. (2009) and Florio and Leoni. (2016) by modifying ERM as an intervening variable and several related control variables.

The research model is as follows.

\[ CFP_{it+1} = \beta_0 + \beta_1 BS_{it} + \beta_2 AC_{it} + \beta_3 SG_{it} + \beta_4 AG_{it} + \beta_5 SZ_{it} + \beta_6 LV_{it} + \epsilon_{it} \] .......................... (1)

\[ ERM_{it} = \beta_0 + \beta_1 BS_{it} + \beta_2 AC_{it} + \beta_3 SG_{it} + \beta_4 AG_{it} + \beta_5 SZ_{it} + \beta_6 LV_{it} + \epsilon_{it} \] .......................... (2)

\[ CFP_{it+1} = \beta_0 + \beta_1 ERM_{it} + \beta_2 BS_{it} + \beta_3 AC_{it} + \beta_4 SG_{it} + \beta_5 AG_{it} + \beta_6 SZ_{it} + \beta_7 LV_{it} + \epsilon_{it} \] .......................... (3)

Data analysis to test the hypothesis has used structural equation modeling (SEM) with partial least squares (PLS) approach (WarpPLS), because SEM-PLS can analyze the measurement model reflective, formative, and latent variables even though only one indicator, without causing identification problems (Sholihin and Ratmono, 2013). Besides, SEM-PLS also does not require the assumption of a normal distribution (Sholihin et al., 2011). Testing ERM as an intervening variable was determined by the steps of Baron and Kenny (1986) and Hair et al. (2011).

### 3.3 Validity and Reliability

Before testing the structural relationships between latent variables, an outer model test is performed, which is known as the construct validity and reliability test. This study has two latent variables that require reflective measurements, namely the company’s financial performance (CFP) and Enterprise Risk Management (ERM). Table 1 shows that loading of each indicator fulfills convergent validity even though there is loading below 0.70, but the p-value is significant (<0.05). According to Hair, et al. (2013) loading between 0.40-0.70 can be maintained if it has an impact on increasing the Average variance extracted (AVE). However, additional testing results indicate removal of loading below 0.70 does not increase AVE (test results are not presented in this paper).

<table>
<thead>
<tr>
<th>Indikator</th>
<th>CFP</th>
<th>ERM</th>
<th>BC</th>
<th>AC</th>
<th>SG</th>
<th>AG</th>
<th>SZ</th>
<th>LV</th>
<th>SE</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROEt+1</td>
<td>0.940</td>
<td>0.010</td>
<td>0.022</td>
<td>-0.013</td>
<td>-0.031</td>
<td>0.159</td>
<td>-0.023</td>
<td>0.144</td>
<td>0.093</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>ROAt+1</td>
<td>0.949</td>
<td>-0.01</td>
<td>-0.022</td>
<td>0.013</td>
<td>0.031</td>
<td>-0.159</td>
<td>0.023</td>
<td>-0.144</td>
<td>0.073</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>IE</td>
<td>-0.014</td>
<td>(0.760)</td>
<td>-0.027</td>
<td>0.084</td>
<td>-0.046</td>
<td>-0.076</td>
<td>-0.143</td>
<td>-0.057</td>
<td>0.033</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>OS</td>
<td>-0.004</td>
<td>(0.453)</td>
<td>-0.451</td>
<td>0.049</td>
<td>0.05</td>
<td>0.083</td>
<td>0.43</td>
<td>-0.141</td>
<td>0.038</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>EI</td>
<td>-0.049</td>
<td>(0.881)</td>
<td>0.103</td>
<td>0.013</td>
<td>-0.005</td>
<td>0.024</td>
<td>-0.033</td>
<td>0.064</td>
<td>0.026</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>RA</td>
<td>0.058</td>
<td>(0.840)</td>
<td>0.108</td>
<td>-0.131</td>
<td>-0.021</td>
<td>0.057</td>
<td>0.01</td>
<td>0.101</td>
<td>0.033</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>RR</td>
<td>0.052</td>
<td>(0.860)</td>
<td>0.094</td>
<td>-0.057</td>
<td>-0.019</td>
<td>0.058</td>
<td>-0.013</td>
<td>0.111</td>
<td>0.033</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>CA</td>
<td>-0.047</td>
<td>(0.584)</td>
<td>0.105</td>
<td>0.148</td>
<td>0.054</td>
<td>-0.066</td>
<td>-0.164</td>
<td>-0.148</td>
<td>0.044</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>IC</td>
<td>-0.025</td>
<td>(0.621)</td>
<td>-0.113</td>
<td>0.012</td>
<td>0.045</td>
<td>-0.086</td>
<td>-0.081</td>
<td>-0.084</td>
<td>0.029</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>MG</td>
<td>0.012</td>
<td>(0.529)</td>
<td>-0.066</td>
<td>-0.076</td>
<td>-0.023</td>
<td>-0.015</td>
<td>0.216</td>
<td>0.019</td>
<td>0.083</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Note: P values < 0.05 are desirable for reflective indicators.

Table 2 shows the results of the reliability and collinearity tests, that the composite reliability and Cronbach’s alpha values for CFP and ERM variables are above 0.70. Next AVE shows a value of 0.90 for the CFP variable and 0.50 for the ERM variable. These results fulfill the requirements of composite reliability and Cronbach’s
alpha > 0.70 or have AVE values above 0.50 (Fornell and Lacker, 1981). Furthermore, the value of Full collinearity VIFs for all variables shows values below 3.3 so that it can be stated that the model is free from collinearity problems.

4. Results

4.1 Descriptive Statistics

Table 3 shows the descriptive statistics of each variable, including the minimum, maximum, average and standard deviation values. Descriptive statistical data were used for testing models 1, 2 and 3, with a sample of 670 firm-years. The average value of the CFP variable is 0.101, indicating that the average financial performance of the company is 10%, with std. Deviation of 14% (above average), which means that the financial performance of the sample companies varies considerably. The average ERM of 0.495 and std. Deviation 0.095, these results indicate the level of disclosure of ERM of companies in Indonesia around 49%. The average size of the Board of Directors (BC) and the audit committee (AC) of the sample is 4 and 3 people, this data shows that the average sample company has met regulatory requirements in Indonesia.

4.2 Hypothesis Testing

Before explaining the results of hypothesis testing, evaluation results are first presented that show the goodness of fit model, as follows. APC = 0.110, P <0.001; ARS = 0.178, P <0.001; and AVIF = 1.195, Good if <5. These results indicate that the model criteria have been met where the APC and ARS are significant <0.05 and the AVIF value indicates a number <0.05. The following R2 for each model (1, 2, and 3) is 12.20%, 23.10%, and 12.50%. The results of hypothesis testing are presented in Figure 1 and Table 4 below.
Table 4. The Results of Hypothesis Testing

<table>
<thead>
<tr>
<th>The Effects</th>
<th>Model</th>
<th>Variable</th>
<th>Independent</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct effects</td>
<td>Model 1</td>
<td>CFP</td>
<td>0.100***</td>
<td>-0.04</td>
</tr>
<tr>
<td></td>
<td>Model 2</td>
<td>ERM</td>
<td>0.115***</td>
<td>0.105***</td>
</tr>
<tr>
<td>Indirect effects</td>
<td>Model 3</td>
<td>CFP</td>
<td>0.055*</td>
<td>0.093*</td>
</tr>
</tbody>
</table>

Panel B: Mediating and Hypothesis Decision

<table>
<thead>
<tr>
<th>Mediating</th>
<th>Relationship of Variables</th>
<th>P-value</th>
<th>Decision</th>
<th>Hypothesis Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC → CFP</td>
<td>Significance</td>
<td>Partial Mediation</td>
<td>H1: Supported</td>
<td></td>
</tr>
<tr>
<td>BC → ERM → CFP</td>
<td>Significance</td>
<td></td>
<td>H2: No supported</td>
<td></td>
</tr>
<tr>
<td>AC → CFP</td>
<td>No Significance</td>
<td></td>
<td>H3: Supported</td>
<td></td>
</tr>
<tr>
<td>AC → ERM → CFP</td>
<td>Significance - No Significance</td>
<td></td>
<td>H4: Supported</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>H5: Supported</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>H6: Supported</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>H7: No supported</td>
<td></td>
</tr>
</tbody>
</table>

Notes: *p < 0.10; **p < 0.05; ***p < 0.01

Table 4 Panel A presents the results of testing hypotheses 1-5. Hypothesis 1 shows that the BC has a positive effect on CFP (β = 0.097, p <0.10), this result shows that the greater the Board of Directors size, the company’s financial performance will increase (H1 supported). Hypothesis 2 shows that AC has no effect on CFP (β = -0.04, p> 0.10), in which the size of the audit committee does not determine the company’s financial performance (H2 no supported). The results of testing hypotheses 3 and 4 show that the BC and AC variables have a positive effect on ERM with coefficients (β = 0.115, p <0.01; β = 0.105, p <0.01). These results indicate that large BC and AC sizes increase the application of ERM (H3 and H4 supported). The results of testing of hypothesis 5, indicate that there is a positive effect of ERM on CFP (β = 0.055, p <0.10). These results indicate that the implementation of ERM can improve the company’s future financial performance (H5 supported).

Table 4 Panel B presents the results of mediation testing (hypotheses 6 and 7). The test mediates ERM on the relationship of BC and AC on CFP, using the following Baron and Kenny (1986) steps; (a) There are Direct
effects BC and AC must have a significant effect on CFP, but the result only BC has a significant effect on CFP (Hypothesis 1), while AC does not have an effect on CFP (Hypothesis 2). (b) simultaneous testing results show that BC has a significant effect on CFP; BC has a significant positive effect on ERM (Hypothesis 3), and ERM has a significant positive effect on CFP (Hypothesis 5). Based on these tests indicate that in the second step of testing the relationship between BC and CFP remains significant, but the coefficient decreases from $\beta = 0.100$ (Model 1) to $\beta = 0.093$ (Model 3). Therefore, according to the approach of Baron and Kenny (1986) and Hair et al. (2011), ERM partially mediates the relationship of BC to CFP (H6 supported). These results indicate that ERM is not the only mediator between BC and CFP, but there are still other mediating variables (Baron and Kenny, 1986). Conversely, ERM mediation in the relationship between AC and CFP is not supported (H7 no supported). Furthermore, the SZ control variable had a positive effect on ERM ($\beta = 0.373$, $p < 0.01$), SG and SZ had a positive effect on CFP ($\beta = 0.189$, $p < 0.01$; $\beta = 0.100$, $p < 0.05$), while AG and LV have no effect on both ERM and CFP.

5. Discussion

Agency theory indicates that a strong Board of Directors can reduce agency conflict and can align the interests of agents with the interests of the principals. In this case, the size of the Board of Directors largely determines the quality of supervision, especially in improving company performance. The results support the agency theory and resource dependence theory where a large Board of Directors is a solution to the problem of resources. This is especially for monitoring and improving organizational performance by implementing ERM effectively, so that the organization continues to survive. This is indicated by the positive relationship of Board of Directors size on the company’s financial performance. The results of this study are in line with research undertaken by Belkhir (2009), Husaini and Saiful (2017) and Echeverri et al. (2019). These results also support the research of Desender (2007), Wan Daud et al. (2011), Gottwald and Mensah (2015) and Husaini and Saiful (2019) who concluded that the effective implementation of ERM requires optimal supervision by the Board of Directors and audit committees, both of these functions have the competence to oversee the accuracy of ERM implementation, so that large Boards of Directors and audit committees can improve the application of ERM. Furthermore, the results of this study also show that there is a positive relationship between the implementation of ERM and the company’s financial performance, which means that the effective implementation of ERM will improve the company’s financial performance; this is consistent with the statement (Gordon et., 2009; and Pagach and Warr, 2010) that with the implementation of company ERM, direct and indirect costs can be reduced, through controlling the cost centers and sources of income, so that it can improve company performance, and can help companies to avoid losses, bankruptcy, and reputation costs. Besides, the application of ERM can also reduce agency costs in the form of monitoring costs (Schroeck, 2002). These results are in line with the results of a study conducted by Florio and Leoni (2016), Silva et al. (2016), Kommunuri et al. (2015), Hoyt and Lysenber (2011), Gordon et al. (2009), and Husaini and Saiful (2017) who concluded that company performance would improve when companies implemented ERM effectively and holistically.

Conclusion

Based on the results of the study, it can be concluded that the size of the Board of Directors can improve the company’s financial performance; a large board of commissioners reflects an effective monitoring system to improve company performance. Likewise, the effective implementation of ERM requires optimal supervision by the Board of Directors and the audit committee. The effective implementation of ERM will also improve the company’s financial performance. Furthermore, the application of ERM partially mediates the relationship between the size of the Board of Directors and the financial performance of the company, in this case, the function of the Board must continuously oversee the implementation of ERM, because it will have implications for improving company performance. The results of this study support agency theory and resource dependence theory where a large Board of Directors is a solution to resource problems for monitoring purposes, and to improve organizational performance through the effective application of ERM. In other words, the company’s financial performance increases when the oversight function of the organization (the size of the Board of Directors is large) and the adoption of ERM increases. Therefore, the large size of the commissioners is a solution to
strengthen the supervisory function by the board of commissioners and the audit committee in increasing the application of ERM, which impacts on the improvement of the company’s financial performance.

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INNOVATION, ENVIRONMENTAL MANAGEMENT ACCOUNTING, FUTURE PERFORMANCE: EVIDENCE IN INDONESIA

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Abstract. This study aims to identify and analyze the influence of environmental management accounting on future performance with innovation as an intervening. Innovation is one strategy to produce a competitive advantage. With the competitive advantage achieved, corporate performance is expected to be increased. However, companies are expected to implement a strategy that not only emphasizes business continuity, but also can carry out its business process with the concept of sustainable development. Using 122 manufacturing companies which are listed in Indonesian Stock Exchange, this study tests the hypotheses using path analysis. The paper provides empirical insights about how environmental management accounting does not affect future performance while innovation can mediate the effect of environmental management accounting on future performance.

Keywords: environmental management accounting; innovation; future performance


JEL Classifications: Q01, L25.

1. Introduction

Competition in the business world is something every company must face, including companies in Indonesia. The existing competition requires the company to work harder in running its business process, especially now that competitors come from within the country and from abroad. Companies should always strive to improve product quality, understand market conditions, improve production systems, distribution, and management within the company to survive in the business world.

Innovation is one strategy that can be undertaken to face business competition. Innovation undertaken by the company aims to produce a competitive advantage. With the competitive advantage achieved from the implementation of innovation, it is expected that future corporate performance will also increase. According to OECD (2005), innovation is the implementation of new or significantly developed goods or services, or processes, new marketing methods, or new organizational methods in business practices, workplace organizations or external relationships.

Innovation is an important undertaking for a company in order to develop its business processes and affects the going concern of the company. Good innovation will produce quality products or services with cost efficiency, improvisation of products and produce different products from previous ones. The application of good innovation will have an impact on the improvement of the company’s future performance, for example, innovations by PT Semen Indonesia. PT Semen Indonesia made technological innovations in 2013 by providing energy
conservation technology and CO2 Gases Emission Technology through the utilization of biomass and B3 waste as Alternative Fuels.

Technological innovations undertaken by PT Semen Indonesia can have an impact on cost efficiency and can reduce the impact of environmental damage occurring. The environmental damage that is occurring today is the result of man’s own actions, both personally and in groups. The impacts most felt by humans are climate change and global warming. Some real cases of climate change and global warming have occurred in both Indonesia and other countries. For example, increased temperatures cause sea levels to rise and impact on frequent floods, forest fires, tornadoes and more. The existence of environmental problems not only affects the environment, but other areas such as the economy in a country can also be disrupted. Therefore, companies in Indonesia are expected to implement a strategy that not only emphasizes business continuity but also can carry out its business process with the concept of sustainable development.

The theory of legitimacy according to Dowling and Pfeffer (1975) states that: “Legitimacy is important to the organization, the limits emphasized by social norms and values, and reactions to those limits promote the importance of organizational behavioral analysis with regard to environmental aspects”. The company seeks to create harmony between the social values inherent in its business processes with the norms of behavior existing in the social system of society. As long as the two value systems are aligned, they can be called corporate legitimacy. However, when there is a dissonance between the two value systems, there will be a threat to the legitimacy of the company or the legitimacy gap. It is also related to the going concern of the company. Strategies that are planned, selected, and performed by the company must be based on the theory of legitimacy.

Legitimacy theory can also be achieved by applying green accounting. According to Cohen and Philipsen (2011), through the application of green accounting it is expected the environment will preserve sustainability, because in implementing green accounting the company will voluntarily obey government policies where the company runs its business. The purpose of green accounting is to identify the negative effects of corporate activities and systems on the environment, so that decisions can be effective and efficient in relation to environmental protection.

One strategy implementation with a green accounting objective is to implement environmental management accounting (EMA). EMA, according to International Federation of Accountants (2005), is defined as the management of environmental and economic performance through the development and application of appropriate environment related accounting systems and practices may include reporting and auditing in some enterprises. According to the UN Division for sustainability development (2003), EMA is a better and more comprehensive approach to management accounting. UNDSD states that the use of general environmental management accounting information is for internal organizational and decision-making calculations.

The environmental management accounting performed by the company brings the entity closer to improving the company’s future performance, which is one benchmark of success of a company. Company performance will always be seen by the stakeholder in taking the business decision of the company. Information on company performance can be obtained from financial statements, from which indicators in assessing company performance can be seen through profitability ratios.

Financial performance, which is the main focus in this research, is one important aspect used by an entity or company as a benchmark of business success in managing the company’s operations. Company performance is a description of the level of adjustment of the implementation of an activity in realizing the goals, objectives, mission, and vision of the company contained in the strategic planning of a company (Suharto et al., 2013). Given the natural phenomena that often occur, the expected performance results of entities, especially manufacturing industry companies, provide the impact of sustainable development.

Aulia (2010) conducted research on market reaction to measurement of accounting performance of prospector and defender companies with a product life cycle approach. The results of his research prove that the aver-
age growth in profit and sales growth of prospective companies and companies significant defender. Aulia’s research results show that the average dividend payout ratio of the defender company is bigger than the company’s prospector, while the average return on investment of the prospective company does not differ significantly from the defender company.

Application of environmental management accounting (EMA) is widely discussed in scientific literature (Senan 2018; Arbidane, Mietule, 2018; Pechancová et al., 2019; Vegera et al, 2019; Rezk et al., 2019; El Iysaouy et al., 2019; El Idrissi et al., 2020).

EMA can be one way to improve the company’s future performance. According to research conducted by Molina-Azorí’n et al. (2009), there is a significant positive relationship between environmental management accounting and financial performance that is dominant. Environmental Management Accounting and financial performance can influence each other.

Due to the inconsistency in the results of research relating environmental management accounting (EMA) to future performance, it is necessary to examine the variables that can bridge the influence of EMA on future performance. This research uses innovation variable as a bridging variable.

EMA that has been applied and formed by the company has an effect on the innovations produced by the company. This is supported by research conducted by Rustika (2011), which states that the application of EMA has a positive impact on innovation. The application of EMA is one of the important components of accounting innovation that is useful for the purpose of efficiency and effectiveness to be achieved. On the other side, Ferreira and Carly (2009) state that the application of environmental management accounting has no effect on company innovation. Innovation is significantly influenced by R & D effort and firm size.

The company’s innovation is one of the key improvements to the company’s future performance. Saunila et al. (2013) state that the higher the company’s ability to create innovation, the better the company’s financial performance. Companies that measure the determinants of innovation ability, primarily through the exploitation of active external knowledge, tend to have higher levels of innovation, and have positive values that impact business performance. Performance measurement can be used as a tool to improve SMEs performance through innovation capability.

However, Santos et al. [24] state that although innovation has a positive effect on firm performance the effect is not significant. This research sample found little evidence that innovation in one period has a positive influence on the company’s performance in the future. Possible explanations for this result are the effects of long-term innovation, as well as the use of a one-year analysis between innovation and financial performance. The effect may not have materialized in the sample measurement.

2. Literature Review

2.1. Legitimacy Theory

The theory of legitimacy states that companies must ensure that their operations are aligned in accordance with social norms and values in society. If the legitimacy of the company is not in accordance with the social values or norms of society, the legitimacy of the company will be threatened. Differences between corporate value and community value are often called legitimacy gaps. O’Donovan (2002) argues that the causes of legitimacy gaps are a change in company performance, but public expectations of company performance have not changed. Secondly, the company’s performance has not changed but the public’s expectation on the company’s performance has changed. Thirdly, the company’s performance and people’s expectations change in different directions or in the same direction at different times.
2.2. Stakeholders Theory

This theory states that the company is not an entity that only operates for its own interests, but also must pay attention to the interests of stakeholders (Ghozali & Chariri, 2007). Freeman (1984) defines stakeholders as individuals or groups that can influence and/or be influenced by organizations to achieve certain goals as the impact of organizational activity. Stakeholders divided into two types, namely internal stakeholders and external stakeholders. The company’s efforts to establish a strategy typology and to implement environmental management accounting are expected to keep the stakeholders in the best interest, so that stakeholders will provide feedback to companies such as supporting the company’s operations to improve future performance.

2.3. The Effect of Environmental Management Accounting On Innovation

The International Federation of Accountants (2005) defines EMA as the management of environmental and economic performance through the development and application of appropriate environment related accounting systems and practices. The concept of environmental management accounting is used to perform monitoring and evaluation of measurable information from financial and management as well as data flows on reciprocal materials and energy, in order to improve the efficiency of the use of materials and energy, reduce the environmental impact of the company’s operations, products and services, reducing environmental risks and improving the results of corporate management (Ikhsan, 2009). Berry and Rondinelli (1998) argue that there are several forces that encourage companies to take environmental management actions, namely, regulatory demand, cost factors, stakeholders forces and competitive requirements.

The cost efficiency strategy can be achieved with the concept of environmentally friendly innovation. EMA as a prime example of innovation has an influence on the application of innovation. The application of innovation is said to increase by combining significant changes to existing products or creating new products.

H1: Environmental management accounting has an effect on innovation

2.4. The Effect of Innovation On Future Performance

According to OECD (2005) innovation is the implementation of new or developed products (goods or services) or new processes, marketing methods, or new organizational methods on business practices, organizations at work or external relationships. Innovation is divided into four dimensions, namely, product innovation, process innovation, marketing innovation and organizational innovation (2005). To face competition and to respond to market challenges, every company is required to innovate. A product resulting from an innovation will have an impact on increased sales due to increased market share of new products produced. Increased sales result in the company’s future performance increase as well.

Future performance is a measure that can be used to evaluate the success of a company in generating profits in the future. The company’s financial performance can generally be seen from two viewpoints (Al-Tuwajri et al., 2003) ie, market based measured and accounting based measured. Market based measured is one of the benchmarks of stock performance in the company so that investors always seek the maximum return from the company after considering the possible risks. The rationale of accounting based measured is the focus of corporate earnings on policy changes from management. In this study, company performance is measured by using accounting based measured which is return on assets (ROA).

H2: Innovation has an effect on future performance

2.5. The Effect of Environmental Management Accounting On Future Performance

Stakeholders nowadays not only look at the financial sector but also look at the company’s responsibilities in the social and environmental fields. Environmental costs are costs incurred due to low environmental quality due to production activities carried out by the company. The implementation of EMA provides mutually ben-
eficial solutions for companies and stakeholders. If stakeholders feel interested in the company’s products and use them, it will increase company profits. The increase in corporate profits is expected to result in an increase in the company’s performance both in the environmental and financial fields.

EMA focuses on physical material inputs and outputs that allow managers to assess material related aspects of the company’s environmental performance as an effort to get legitimacy from the community. The application of EMA is a proof to the public that in operational activities, the company continues to pay attention to the environment, and pay attention to the prevailing norms in society. These efforts will give more value to the community towards the company, so that the company gain legitimacy from the community and can help stakeholders to manage future performance improvements in both environmental and economic perspectives.

The concept of environmental management accounting can be used to monitor and evaluate financial and management information to improve the efficiency of the use of materials and energy, reduce the environmental impact of the company’s operations, products and services, reduce environmental risks and improve the results of the company’s management. In other words, if the application of EMA increases then it is expected that future performance will increase.

H3: Environmental management accounting has an effect on future performance

2.6. The Effect of Innovation on Environmental Management Accounting - Future Performance Relationship

The implementation of Environmental Management Accounting is a form of competitive advantage in cost focus strategies, especially efficiency in environmental costs. The concept of environmentally friendly innovation is one example of a cost efficiency strategy that can be undertaken by a company. The application of innovation is said to increase by combining significant changes to existing products or creating new products. In addition, the use of EMA has led to faster growth in operating margins for product formation and higher product sales growth [9]. The company applies EMA as evidence to the public that the company has created innovations while still paying attention to the environment and the prevailing norms in society. These efforts will provide positive value from the community towards the company, so that the company gains legitimacy from the community and enhances the company’s future performance.

Based on stakeholder theory, the innovation carried out by the company is an effort to fulfill the expectations of stakeholders to improve their welfare. This is evident from the products created which fulfill customer expectations on the basis of customer needs. In addition, innovations made by the company will have an impact on future performance due to the absence of competitors from new products created.

Improving company performance from new products will provide benefits to stakeholders due to an increase in profits received by the company from new products created. Karlsson and Tavassoli (2015) show that innovation mediates the influence of environmental accounting management on future performance.

H4: Innovation has a mediating effect on Environmental Management Accounting - future performance relationship

3. Research Methodology

3.1. Operational Definition of Variable

3.1.1. Environmental Management Accounting (EMA)

Environmental Management Accounting is the management of environmental and economic performance through the development and application of appropriate environment related accounting systems and practices. In this study, EMA was measured using production cost indicator with the following formula (Peters, 2005):
3.1.2. Future Performance

Future performance is a measure of the success of a company in generating profits in the future. In this study, the measurement of future performance uses Return on Assets (ROA) by dividing net income next year by total assets next year. Mathematically, ROA is formulated as follows (Demerjian et al., 2013; Ong & Poyen, 2013; Tabassum et al., 2014):

\[
ROA_{t+1} = \frac{\text{Earnings before extraordinary items}_{t+1}}{\text{Total assets}_{t+1}}
\]

3.13. Innovation

According to OECD [21] innovation is the implementation of new or developed products (goods or services) or new processes, marketing methods, or new organizational methods on business practices, organizations at work or external relationships. Innovation is measured by the following formula (Peters, 2005):

\[
\text{Innovation} = \frac{\text{R&D Cost}}{\text{Total Asset}}
\]

3.2. Data Source

Using 122 manufacturing sector companies listed on the Indonesia Stock Exchange (BEI) in 2011 - 2015 as a sample, this study uses analytical techniques in the form of path analysis techniques; researchers used the influence of intervening variables as a link between the dependent and independent variables in testing the hypothesis. Researchers tested the hypothesis with the help of statistical tools which is SPSS version 20.

4. Result and Discussion

4.1. Results

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td></td>
<td></td>
<td></td>
<td>9,617</td>
</tr>
<tr>
<td>EMA</td>
<td>-0,0002779</td>
<td></td>
<td>-0,016</td>
<td>-0,177</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>0,107</td>
<td></td>
<td>0,014</td>
<td>7,455</td>
</tr>
<tr>
<td>EMA</td>
<td>0,055</td>
<td></td>
<td>0,045</td>
<td>0,099</td>
</tr>
<tr>
<td>Innovation</td>
<td>54,145</td>
<td></td>
<td>26,178</td>
<td>0,170</td>
</tr>
</tbody>
</table>
Testing the effect of independent variables on the dependent variables in the presence of intervening variables can be done with the Sobel Test.

<table>
<thead>
<tr>
<th>Path</th>
<th>Path Coefficients</th>
<th>Standard Error</th>
<th>Standard Error</th>
<th>Standard Error</th>
<th>Hasil Uji Sobel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Management Accounting -&gt; Innovation</td>
<td>0.000</td>
<td>-0.00002779</td>
<td>-</td>
<td>-</td>
<td>0.00167</td>
</tr>
<tr>
<td>Innovation -&gt; Future Performance</td>
<td>26.178</td>
<td>-</td>
<td>54.145</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

Based on the table above, the t-count value of 2.361402 > t-table value 1.98 (sig.5%), indicating that innovation can be the link between environmental management accounting and future performance.

4.2. Discussions

4.2.1. The Effect of Environmental Management Accounting On Innovation

Based on statistical analysis environmental management accounting has a negative and insignificant effect on innovation. This is indicated from the significance value of 0.685 (> 0.05). The development of the times makes the company not only create strategies that can be used to achieve its goals, but also to achieve the legitimacy of society. One method that companies can apply to the goal of achieving community legitimacy is environmental management accounting. The implementation of Environmental Management Accounting is a form of competitive advantage in cost focus strategies, especially efficiency at environmental costs. The cost efficiency strategy can be achieved with the concept of environmentally friendly innovation. EMA has a negative effect on the application of innovation.

According to Berry and Rondinelli (1998), there are several reasons that encourage companies towards environmental management, such as regulatory demand, stakeholders forces, cost factors and competitive requirements. The measurement of environmental management accounting in this study uses the amount of production cost of the company in the previous year minus the production cost in the current year. According to the sample data, the production cost of the current year is greater than the cost of the previous year. This can be the cause of EMA having no effect on innovation.

Insignificant results occur due to the minimization of production costs that cannot be applied in the company, resulting in technology from the company also cannot be improved. As a result of technology that cannot be developed, the production run by the company also decreased. EMA implementation does not encourage significant innovation.

This is in accordance with the theory of legitimacy, where environmental management accounting (EMA) run by the company is expected to be an attempt to gain legitimacy from the community. The company implements EMA as a proof to the public that the company has created an environmentally friendly innovation, and in accordance with the norms prevailing in society. These efforts will provide a positive value of society to the company, so the company obtains the legitimacy of the community.

The use of EMA can be an opportunity to develop innovations both in products and processes and in reducing production costs. The existence of environmental regulations applied by the government could be one reason that the results of the analysis are not significant. Another possible explanation is that despite the similar characteristics possessed by EMA and other accounting innovations, there is a difference in the perceptions of costs and benefits between these innovations that contribute to various research findings. This difference can occur due to lack of awareness of the company in applying EMA or the way companies interpret the EMA. The results of this study are in line with the research of Ferreira and Carly (2009).
4.2.2. The Effect of Innovation on Future Performance

Based on statistical analysis, innovation has a significant impact on future performance. This is shown from the significance value of 0.031 (<0.05).

Resource-based view theory explains that firms will gain a competitive advantage when they have valuable resources, are difficult to replicate and have no substitution. To gain a competitive advantage, the company makes various efforts, one of which is innovation. The result of innovation is expected to be a tool to gain a competitive advantage. As companies achieve competitive advantage, corporate sales will increase, leading to an increase in the company’s future performance.

Based on the theory of stakeholders, the company is not only responsible for the internal party of the company, but also for the company’s external party. The company’s innovation activity is one way to improve the company’s future performance and also to improve the welfare of stakeholders. Profits gained by stakeholders will increase along with the improvement of company performance, so that the support given to the company will also be higher. Continuous innovation aims to create new products that fit with the times to follow different consumer preferences. The increasing variety of products, the market share of the company will also increase due to the increasing number of consumers with the fulfillment of consumer satisfaction on products produced by the company. Companies that do not produce many innovations to competitors for new products that they create and develop so that the impact on corporate profits and increased corporate performance in the future.

This is in line with Karlsson and Tavassoli (2015) research. According to Karlsson and Tavassoli (2015), innovation is introducing new products that are new combinations of characteristics that align with the preferences of potential customers or change the characteristics of current products by increasing the willingness of customers to pay for the overall characteristics created. Innovation is said to work if the resulting product can contribute to an increase in company sales. Innovation also contributes to reducing operational costs due to cheaper materials, components and systems.

4.2.3. The Effect of Environmental Management Accounting On Future Performance

Based on statistical analysis, environmental management accounting has a positive and insignificant effect on future performance. This is indicated from the significance value of 0.685 (>0.05).

The application of environmental management accounting is one of the ways to achieve competitive advantage through cost-focused strategy, especially efficiency at environmental cost. Environmental management accounting encourages the reduction of costs and environmental impacts of business processes simultaneously. EMA also encourages the implementation of costs efficient innovation so as to ensure the sustainability of the company in the future (sustainability development).

According to Berry and Rondinelli (1998), there are several forces that encourage companies to participate in environmental management, one of which is cost factors. The measurement of environmental management accounting in this study uses the amount of production cost of the company in the previous year minus the production cost in the current year. According to the sample data, the production cost for the current year is greater than the previous year’s cost, which results in negative EMA measurement results. The results are not significant because the minimization of production costs that cannot be applied in the company result in technology from the company which also cannot be improved. As a result of this, the company’s production also decreased. EMA implementation does not encourage significant innovation. Declining production of new products causes sales to decline so that the company’s profits also decline. Future company performance also decreased, so it can be concluded EMA has not significantly affected where the future performance.

This is in accordance with the theory of legitimacy, environmental management accounting (EMA) run by the company is expected to be an attempt to gain legitimacy from the community. The company implements EMA
as a proof to the public that the company has created innovation by keeping an eye on the environment and in accordance with prevailing norms in society. These efforts will provide a positive value of society to the company, so the company acquires the legitimacy of the community. Implementation of environmental management accounting in the company will also increase the satisfaction of its stakeholders.

Environmental management practices are driven by the moral obligation to reduce the impacts of climate change and on the desire to meet the current emerging environmental regulations. The application of environmental management accounting is not only driven by financial motives. Moral and ethical obligations to mitigate negative climate impacts and respect for environmental regulations are reasons for implementing environmental management accounting. This is in line with Nyirenda et al. research (2013).

4.2.4. The Mediating Effect of Innovation on Environmental Management Accounting - Future Performance Relationship

The results of the sobel test with the t-count value of 2.361402 which is greater than the t-table value of 1.98 (sig. 5%), proves that innovation can mediate the influence of environmental management accounting on future performance.

In accordance with the theory of legitimacy, environmental management accounting (EMA) run by a company is expected to be an effort to gain legitimacy from the community. The company applies EMA as evidence to the public that the company has created environmentally friendly innovations, and in accordance with the norms prevailing in society.

These efforts will provide positive values from the community to the company, so that the company obtains legitimacy from the community. The use of EMA can be an opportunity to be able to develop innovations in both products and processes and in reducing production costs in order to increase the company’s future performance.

According to the results of the sobel test, innovation has linked environmental management accounting with future performance. This happens because the innovations implemented by the company can be used to develop ideas and products. These innovations are very likely to lead to future performance of companies. Eco-friendly innovations contribute to the reduction of the environmental burden or the company’s going concern target in producing environmentally friendly products with the goal of community legitimacy. The results of this study are in line with research Karlsson and Tavassoli (2015).

5. Conclusions

Based on hypothesis testing, the result of research is as follows: (1) Environmental Management Accounting (EMA) has a negative and insignificant effect on innovation. According to the sample data, the production cost of the current year is greater than the cost of the previous year. This can be the cause of EMA having no effect on innovation; (2) Innovation has a positive and significant influence on future performance. With an increasing variety of products, the market share of the company will also increase due to the increasing number of consumers. Companies that innovate for new products they create and develop impact on increased corporate profits and increased future performance; (3) Environmental Management Accounting (EMA) has a positive and insignificant effect on future performance. According to the sample data, the production cost of the current year is greater than the previous year’s cost, which results in negative EMA measurement results. Cost factors can be the cause of EMA not encouraging the production of new products, resulting in the decline of sales, profits and also the future performance. And finally, (4) Innovation has proven to be able to bridge the environmental management accounting variables towards future performance. This happens because the innovations implemented by the company can be used to develop ideas and products. Eco-friendly innovations contribute to the reduction of the environmental burden or the company’s going concern target in producing environmentally friendly products with the goal of community legitimacy. This innovation leads to the company’s future performance.
References


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Abstract. This study examines the tone of language in sustainability report, focusing on the construction industrial sector of companies listed in Indonesian Stock Exchange year 2010 until 2018. This study analyzed 152 sustainability report using sentiment analysis method wrote in python code. This study shows that around 68%-79% of disclosures in sustainability reports show positive sentiment. These results indicate a high level of corporate accountability in the construction industry related to sustainability. This research contributes to stakeholders in making comprehensive decision related to company’s accountability.

Keywords: sustainability report; sentiment analysis; construction sector


JEL Classifications: Q01, M10.

1. Introduction

A country with good infrastructure development reflects the progress and stability of being a prosperous country, with the aim of prospering the community (Nugraha, 2018). As in Indonesia which currently is on a process of improving the infrastructure development during the presidential era of Joko Widodo, within the period of 2014-2019.

Currently, the government is attempting to make companies to be directly involved in efforts to environmental matters by starting to incite the implementation of sustainability report disclosure. Government efforts and commitments then become an important source for each sector to implement sustainable development in their policies and programs, so that they can contribute to reducing emissions and environmental damage (Nasih et al., 2019). As done by companies after the Global Financial Crisis (GFC), which is sought to design new models of corporate social responsibility (CSR) that are more aligned to their core business goals and services (Song et al., 2018). With the aim, the decision to report information is a form of the concept of “accountability” that accounted by the company.

In Indonesia, many companies have been involved in sustainability reports disclosure, which contain information about economic, social and environment (KPMG, 2015). This commitment become serious since the enactment of Law No.40 of 2007 concerning Limited Liability Companies (PT), Article 66 paragraph 2c which
contains the obligations for companies to submit reports of Social and Environmental Responsibility implementation in their Annual Report. In general, this kind of report becomes a benchmark as a qualitative standard and a comparison of companies in a sector to be more valid than a comparison of companies between sectors (Krut & Munis, 1998). With the presentation of qualitative content, actually it is a serious concern for users of information in terms of analysis, comparability and judgment.

The sustainability report with this qualitative standard content brings specific analytical difficulties because its textual database. To support the analysis, this study discusses an analysis that is rarely applied in the sustainability report study, namely the choice of the use of sentiment analysis methods in it. Sentiment analysis or commonly referred as opinion mining techniques, is related to diverse and multidisciplinary artificial intelligence problems, in order to minimize gaps between human and computer (Kaur & Gupta, 2013). Sentiment analysis will find content and even regulate the client’s ideas, likes, hatreds and desires by using complex language. Sentiment analysis will function as management, examination of feelings, sentiments, and intelligence of a writer or speaker in a few different specific texts (Kaur & Gupta, 2013).

Previous research in China on financial reports and CSR conducted by (Song et al., 2018) find that an analysis with subjective object descriptions is characterizing the interactions between CSR scores and financial statement sentiment categories. Other researches also used sentiment analysis but applied to social media contents such as facebook, twitter, and other digital forms (Maindola et al., 2018; Pak & Patroubek, 2010; Agrawal et al., 2011).

This study specifically wants to describe sentiment analysis disclosed in the company’s sustainability reports, especially in the construction sector. The construction sector was chosen because this sector economically made an important contribution, such as create more job vacancies and contribute to gross domestic income (GDP) (Glass, 2012). In addition, there are only few researches that focus on sustainability reports in the construction sector, so this study aims to open up debate and provide an understanding of in sustainability reports disclosure in the construction sector. This study uses sentiment analysis supported by Python software to analyze 152 company’s sustainability reports in the construction sector listed on the Indonesia Stock Exchange from 2010 to 2018.

This study finds that sentiment information on construction companies chose the use of words with positive sentiment and sought to show high accountability. Both form building and non-building construction company are providing positive information, with a percentage of more than or equal to 68%. That means the company shows more attention on the sustainability report disclosure.

This research contributes in the form of forecasting financial performance and supporting corporate stakeholder on decision-making processes (Hajek et al., 2014), which also detects fraud, manages risks, and predicts future performance. This research also can assist stakeholders to analyze and to make decisions related to economic, social and environmental issues.

2. Literature Review

2.1. Overview of Sustainability Report

Companies with focus on social, economic, and environmental issues will gain a competitive advantage and have a credible reputation in the public eyes (Modapothala & Issac, 2009; Vegera et al., 2018; Dudin et al, 2019; Kormishkina et al, 2019; Pechancová et al, 2019; Fatoki, 2019; Bombiak, 2019; El Idrissi et al., 2020; Vigliarolo, 2020; Chehabeddine, Tvaronavičienė, 2020). This kind of focus is shown on company’s sustainability report, as a concept that becomes important for businesses both at national and global levels (Golob & Bartlett, 2007; Lawrence et al., 2013). Companies that concerns about this issue usually have more resources and tend to invest more in various forms of environmental disclosure, such as social-environmental accounting systems, fair trade certification, better work atmosphere, and attract strong environmental stakeholders (Al-Tuwaijri et al., 2004; Clarkson et al., 2008; De Villiers C & Van Staden, 2011; Hackston & Milne, 1996; Patten, 1992; Arvidsson, 2010).
Setiawan et al. (2012) explains that sustainability reports are seen as a form of corporate social responsibility to stakeholders, although the motivation to submit this report can vary, either because of self-awareness or in response to environmental demands. Kolk (2008) also explains that sustainability reporting is a voluntary activity oriented to giving consideration to social and environmental implications in conducting business to internal and external stakeholders. Thus, in terms of the disclosure of social, economic and environmental issues in the Sustainability Report could be a way to increase transparency (Kaymak & Bektas, 2017), accountability, reputation (Aguilera-Caracuel J & Guerrero-Villegas, 2018) awareness about environmental and social practices (Chang et al., 2017), performance (Michelon et al., 2015) and maintain consumer and public support of the company. Gray et al. (1987) also explained that sustainability reporting is a framework to help companies develop meaningful and credible reporting that meets different needs of every stakeholder groups and increase business value.

In the construction sector only few companies disclose sustainability reports. This is evidenced from 16 global construction and real estate companies that are still not established when compared to other sectors, such as financial services or the utility sector (Lampridi & Ringland, 2008). Brown et al. (2009) also stated that the construction industry in the UK was considered to be less up-to-date on global trends for sustainable development; it still less in defining several indicators that are clearly reported; it does not have a clear process to determine materiality and involvement with stakeholders; and it still lack on awareness about sustainability reporting standards.

2.2. Sentiment Analysis

The complexity attached to the Sustainability report means that many people consider sustainability reports difficult to understand by public. This assumption is widely spreading; meanwhile actually this assumption is not right and takes an important role in decision making, especially for stakeholders of a company (Liu, 2010). Because this section contains more information than numerical sections in annual reports (Chan & Franklin, 2011; Kloptchenko et al., 2004). For this matter, textual information processing is needed to focus on sentiment analysis and factual information retrieval (Liu, 2010).

Sentiment Analysis or mining opinion is a diverse and multidisciplinary artificial intelligence in the study of computational opinion, sentiment and emotion (Chopra & Bhatia, 2016). Sentiment analysis is related to identifying and classifying conveyed opinions or sentiments by conducting sentiment analysis in a particular domain, it is possible to identify the influence of data domain in sentiment categorization (Neethu & Rajsree, 2013). Song et al. (2018) has explored various aspects of the language used in the annual reports of US companies. The results show that sentiment information is an important determinant to forecast financial performance, thus can be used to support stakeholder’s decision-making processes (Hajek et al., 2014).

The form of sentiment analysis commonly used in academic, usually caused two problems, namely (Agrawal et al., 2011) classifying documents in the form of positive or negative sentiments, and (Aguilera-Caracuel & Guerrero-Villegas, 2018) classifying sentences or sentence clauses as subjective or objective, and for subjective sentences or clause classifies it as expressing positive, negative or neutral opinions (Indurkhya & Damerau, 2010). In this study, building a trust based on it can then be known automatically the utility value for opinion (Liu, 2010) from a company report namely Sustainability Report.

3. Research Methodology

This research is based on the analysis of 152 sustainability reports, both separated and attached in the annual report of construction companies listed on the Indonesia Stock Exchange in 2010-2018. The annual reports were downloaded from the official website of IDX (Indonesia Stock Exchange) and the GRI (Global Reporting Initiative) database. This study uses sentiment analysis techniques using the Python programming language.

The processed reports are in the form of PDF format in English. These conditions are adjusted to Python’s ability to only analyses English language texts. To overcome the variety of sustainability report forms that are strongly influenced by the company’s disclosure style due to the nature of reporting that is still voluntary, the
author need to perform a text pre-processing procedure including the removal of non-language elements such as still images, changing all letters to lowercase, removing non-alphanumeric symbols, dots, and letters attached to special characters (Goloshchapova et al., 2019). The next stage, the process of sentiment analysis involves grouping points of view in categorical texts such as “positive” or “negative” categories (Liu, 2010).

4. Result and Discussion

Table 1 shows the descriptive statistics of 152 sustainability reports from construction companies. Sentiments are divided into two categories, namely positive sentiment and negative sentiment. The average value of positive sentiment is 162.1382 words, while the average value for negative sentiments is 57.49342 words. It shows that there are around 162 positive words that represent positive opinions or positive sentiments and 57 negative words that represent negative opinions or negative sentiments.

<table>
<thead>
<tr>
<th>Sentiment</th>
<th>Obs.</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sent_Positive</td>
<td>152</td>
<td>162.1382</td>
<td>358.7285</td>
<td>0</td>
<td>3575</td>
</tr>
<tr>
<td>Sent_Negative</td>
<td>152</td>
<td>57.49342</td>
<td>177.7701</td>
<td>0</td>
<td>2022</td>
</tr>
</tbody>
</table>

Table 2 shows the sample distribution breakdowns by year, with the percentage of positive sentiment higher than negative sentiment. Based on 152 sustainability reports observed, the average positive sentiment ranged from 68%-79%, and negative sentiment ranged between 21%-32% from 2010-2018. This shows that construction companies show a positive concern about the efforts of sustainable development. It indicates that construction companies were increasingly improving their carried out information, as appears in the number of positive sentiment that can be said to have stability.

In 2010, we find that construction companies contain 75% positive sentiment, or as many as 1,488 the number of words classified into positive sentiments. While only 25% showed negative sentiment. In 2012, construction companies decreased the use of positive sentiment by 1% but the number of words containing positive sentiments still increased, which amounted to 1,935, while for negative sentiments, also experienced an increase in the number of words, as many as 633.

The following year experienced a significant increase, which amounted to 4% from the previous year, but the number of words containing a significant positive experience has decrease, which only 1,431 words with positive sentiment. This can occur because of an increase in problems or the use of words containing words with negative sentiment. On the next following year, it showed a decrease in the use of words again, with a positive sentiment of 6% but the number of words shown increased. The construction companies that are analyzed certainly show the complexity of information to establish good relationships with stakeholders, without forgetting the reporting objectives, which then the reporting in 2016 became the one with the lowest sentiment, even though it rose sharply to 5,835 words, only 68% of the total words available in the report.

<table>
<thead>
<tr>
<th>Year</th>
<th>Sentiment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive</td>
</tr>
<tr>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>2010</td>
<td>1,488</td>
</tr>
<tr>
<td>2011</td>
<td>1,786</td>
</tr>
<tr>
<td>2012</td>
<td>1,935</td>
</tr>
<tr>
<td>2013</td>
<td>1,431</td>
</tr>
<tr>
<td>2014</td>
<td>2,936</td>
</tr>
</tbody>
</table>
Figure 1. Sample Distribution Breakdowns by Year

Table 3 presents sentiment based on firm distribution which shows two classifications based on sectors, namely building and non-building. There is a difference of 3% between the two sub-sectors. For the non-construction sector, it has more positive sentiment of 77%, while the positive sentiment for the building construction sector is only 73%. That means, 23% of the disclosures made by non-building construction companies contain negative sentiments, while building construction companies contain negative sentiments of 26%.

Table 3. Firm Distribution

<table>
<thead>
<tr>
<th>Sector</th>
<th>Sentiment</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive</td>
<td>%</td>
<td>Negative</td>
</tr>
<tr>
<td>Building</td>
<td>24479</td>
<td>74%</td>
<td>8671</td>
</tr>
<tr>
<td>Non_Building</td>
<td>15558</td>
<td>77%</td>
<td>4739</td>
</tr>
</tbody>
</table>

4. Conclusions

Construction companies in Indonesia demonstrate the accountability of their companies by participating in reporting information relating to environmental issues in their sustainability report. This research that involves 152 sustainability reports of companies in the building and non-building construction sectors listed on the Indonesia Stock Exchange in 2010-2018, was analyzed using sentiment analysis.

The results of the sentiment analysis showed that many companies in the building and non-building construction sectors had used a choice of words that contained positive sentiment compared to negative sentiment. In firm distribution analysis, non-building construction sectors use words with positive sentiments, compared to building one.
From these results, sentiment analysis in construction companies is expected to contribute in helping stakeholders to analyse and assist stakeholders in making decisions related to economic, social and environmental issues while at the same time being an evaluation material for companies to make disclosures in order to increase corporate accountability, as well as paying attention to economic, social and environmental issues.

References


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THE EFFECT OF BOARD EFFECTIVENESS AND INDEPENDENCE ON THE NARRATION OF GREENHOUSE GASES (GHG) EMISSIONS DISCLOSURE

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Abstract. This research presents factors related to narration of GHG emissions disclosure in Indonesia. This phenomenon is important since in the era of advanced information technology firms are now becoming observable to many more interests. Either direct or indirect, positive or negative contribution of it will be noticed by the management in order to keep its reputation. Studying from empirical and logical facts, this research draws 390 public companies listed in IDX and published their annual report for the period of the year 2017. GHG emission disclosure data was acquired from online software TMAILC. This research confirms some factors may support the decision to disclose. They are size of board of commissioners, their independence, and companies’ sensitivity. It is also tested moderating effect of companies’ sensitivity. The result shows that it is significant.

Keywords: greenhouse gasses; TMAILC; annual report; negative externality


JEL Classifications: Q01, L25.

1. Introduction

Corporate accountability problems have resulted in the emergence of various efforts that encourage corporate transparency. This effort is useful to discover how firm be responsible of their activity. The element of external cost is one of measure which is aimed by corporate accountability and transparency. External costs cause symptoms of externalities, which means that the company’s business activities indirectly affect the environment and the community. This illustration can be developed from the concept of marginal social cost because negative externalities arise as a result of unconsidered cost (Hyman, 2009). The global scale of concern for externalities in the environment began to materialize in the 90s. In 1992, the members of United Nation initiate a documentation of carbon emissions (now called as the six elements that trigger the effects of greenhouse gases). The initiative is based on attention to the issue of global warming, as well as the notion that carbon emissions (later GHG) from human activities are the leading cause of global warming. Quoted from un.org, the motivation of Earth Summit was “ to halt the destruction of irreplaceable natural resources and pollution of the planet “ by paying attention to the excessive consumption patterns which also threatened the preservation of the environment. The Earth Summit targets companies and governments to follow eco-efficient production principles.

Indonesia as a country participating in the signing of the UNFCCC framework (United Nations Framework Convention on Climate Change) are actively participated in reducing emissions on the basis of the “national goals of the Republic of Indonesia” as considered in the Law of the Republic of Indonesia no. 16 of 2016.
Points of consideration for the Law of the Republic of Indonesia no. 6 of 1994 states that Indonesia is as “a large absorber greenhouse gases”. Consistent with this statement, Law of the Republic of Indonesia no. 17 of 2004 states in its consideration that “Indonesia has an important role in influencing the climate of the earth.” The same regulation also considers that as an archipelagic country, “Indonesia is very vulnerable to the impacts of climate change.”

benefits for Indonesia in global warming as mentioned by the points of consideration of the Law of the Republic of Indonesia no. 17 of 2004 as the potential for developing “clean technology industries”.

Public companies listed on the Indonesia Stock Exchange are subject to the regulations of the Financial Services Authority as regulators and supervisors of financial service sector activities, including the capital market. Therefore, company have another focus besides economic motives, which is adhering to regulations related to company activities and capital in carrying out fiduciary duty (Ais, 2001). A principle of good corporate governance (GCG) must be fulfilled to show the company’s good faith in establishing communication with outside parties about the extent to which the company’s liability can be known. In addition to give positive impact on the company’s business continuity, adequate accountability also benefits the community and the environment. These benefits can be realized in the form of financial or environmental maintenance which can support the quality of life of many people. Several studies have been conducted to support the idea that public companies in Indonesia have more motivation to control externalities and report them. Positive constructs on the contribution of reporting externalities in evaluating the company empirically are proven through research by Anggraeni (2015). While the internal motivation of public companies in improving the quality of reporting (Nasution & Adhariani, 2016; Solikhah & Winarsih, 2016), increases the scope of reporting (Cahyaningsih & Martina, 2011), and supports comparability of reporting (Frendy & Kusuma, 2011; Narkuniene, Ulbinaitë, 2018; Subačienë et al., 2018), which is considered still problematic (Amel-Zadeh & Serafeim, 2017) have also supported the idea from the perspective of corporate stakeholders’ management and to a certain extent, the GCG mechanism.

2. Literature Review

2.1. Non-Financial Information Disclosure

The company has social responsibility it has ability to make decisions that affect society (Isa, 2012). The conceptualization of social responsibility begins by knowing the existence of a company relationship with the general public in implementing social responsibility. After that various discussions emerged that CSR has an ethical and economic foundation that involves the demands of stakeholders and social needs. CSR is also an essential discussion in terms of marketing and corporate communication in terms of community marketing (societal marketing). Some public perceptions and companies in developing countries (Malaysia) regard CSR as a long-term commitment and require the role of the government as a regulator to encourage CSR activities. (Isa, 2012) outlines the various literacy reviews that CSR exceeds the traditional part of the company and involves organizational accountability, as Bowen calls it a “socially responsible businessman”.

The demands of accountability from both internal and external stakeholders require both financial and non-financial information. Bonsón & Bednárová (2015), Mayorova (2019) compiled several reasons for CSR reporting including: showing a sense of responsibility, meeting stakeholder expectations and contributing to society, managing the legitimacy of the company, maintaining reputation and identity, supporting stakeholder decision-making that has an impact on profitability, and reducing pressure from stakeholders. They mentioned that CSR reporting is needed to respond the attention of corporate scandals and tools to achieve sustainability (Bonsón & Bednárová, 2015).

John Elkington (in Slaper & Hall, 2011) popularized the triple bottom line (TBL) reporting framework that measures the performance of companies in America with a sustainable orientation. Triple (T) in TBL means companies need to report not only one bottom line but three: financial, social, and environmental performance. By using the TBL concept, companies can communicate essential aspects of company performance to stake-
 holders or the wider community.

The validation issues found by Isa (2012) are verified by a survey of investor needs regarding environmental, social, and government data. Respondents in America and Europe found that comparability, standard existence, and costs of collecting and analyzing ESG data as the main factors inhibiting ESG information values (Amel-Zadeh & Serafeim, 2017). Whereas in the same study, it was found that the two main reasons investors did not consider the ESG data: lack of demand from stakeholders and lack of reliable non-financial data access. Several initiatives on an international scale have been carried out to encourage corporate accountability in supporting sustainable development. One of the focuses of this research is the management of greenhouse gas (GHG) emissions of companies that were initiated by international conventions such as the 1985 Vienna Protocol related to Ozone Layer Protection. The Montreal Amendment Protocol 1990 concerning Materials That Can Damage the Ozone Layer, Rio 1992 Convention one of which concerning the United Nations Framework on Climate Change, the 1998 Kyoto Protocol on the United Nations Framework on Climate Change, and the Paris Agreement 2016. These international agreements have been ratified into the Law of Republic Indonesia no. 32 of 2009 concerning Environmental Protection and Management and Presidential Regulation of the Republic of Indonesia no. 71 2011. This regulation concerning the Implementation of the National Greenhouse Gas Inventory, which in detail, discusses the inventory guidelines of the Intergovernmental Panel on Climate Change (IPCC). Law no. 8 of 1995 concerning Capital Market regulates the principle of openness of public companies, one of which is the environmental aspect explained by the Financial Services Authority (OJK) Circular no. 30 of 2016 concerning the Form and Content of the Annual Report of Issuers or Public Companies.

The company utilizes publications provided by international organizations such as the Global Reporting Initiative (GRI) indicator guidelines, KPMG’s survey namely the International Survey of Environmental Reporting, or other indicators introduced both by the private sector and local government regulations. Razeed observed the trend of using these publications by adding criticism to the homogeneity that could be drawn from these guidelines. Razeed (2010) argues that corporate disclosures, as measured by such instructions, can encourage conservatism. Quoting Buzby (1975), Razeed states that exposure (number of scores, indices, etc.) disclosures are not proportional to the quality and adequacy of disclosures. This statement is based on the assumption of Razeed (from Wheeler & Sillanpaa, 1998) that the key to environmental reporting is a way to build stakeholder loyalty and trust.

In line with Razeed, the company’s reputation and the legitimacy of the company formed by the media in the public sphere are behind the research of Anggraeni (2015). In the study, Anggraeni examined the effects of environmental performance on firm value. Although not significant, the research is useful for finding one of the reliable sources of legitimacy, namely the government through the Ministry of Environment (now Environment and Forestry) of the Republic of Indonesia. This ranking also exposes the positive side of companies involved in public space through media publications. Besides, the harmful exposure of the mass media to the operational errors of the company that impacted the catastrophe encouraged companies in specific industrial sectors to provide relevant information that could explain the company’s attention to the issue.

An example is Suaryana (2011) who gives attention to the urgency of social and environmental accounting for the threat of environmental pollution by mining exploitation activities covered by the media. This study uses the disclosure of greenhouse gases (GHGs) or GHG greenhouse gases as reporting on non-financial information of the company. As an issue that has received attention for a long time (since the ratification of Kyoto Protocol in 1992), the disclosure of GHG emissions has received recognition from researchers and also companies. And the treatment of the United Nations with the IPCC which raised the issue to the realm of international politics caused Indonesia to ratify the guidelines issued into the Act and its explanations. An open company is required to implement and disclose good governance practices following international practices that are exemplary, as required by OJK Regulation no. 21 of 2015. One of the global practices that can be used as an example is the OECD guidelines which read “The rights of stakeholders that are established by law are to be respected.” However, the same OJK regulations also reduce pressure with limitations for companies with specific complexity, industry type, and size.
2.2. Hypothesis Development

This study uses the size and independence of company’s board separately to determine corporate governance in the disclosure of greenhouse gases. As the previous study shows that there is a relationship exist between firm disclosure, especially for environmental disclosure to the corporate governance characteristics (Nasih et al., 2019). The size of the board of directors will be proportional to the level of control that drives transparency. This opinion is in line with one of the views of literature on stakeholders, namely the relationship of risk status compiled by Mitchell et al. (1997). Independence is needed when companies are faced with the demands of transparency from many parties, so that information asymmetry is reduced (Goh et al. 2016) and to minimize conflicts of interest through independent decisions on essential company policies. While several other parameters, namely the type of industry, company size, company profitability, and company capital structure included in the study as another explanation. So the role of managers is maintaining the company’s essential policies, accommodate the interests of the shareholders, and preserve the environment by conveying the company’s openness to the greenhouse effect produced. According to Widyadmono (2014) it does not rule out the possibility that a large board size will increase the debt structure that is owned accompanied by an obligation to fulfill environmental compliance. But Elfeky (2017) believes that commitment to the environment and society is very essential to show the company’s commitment. For this description, this study proposes the following hypothesis:

H1: The number of directors has a significant positive effect on GHG reporting
H2: The level of the independence of directors has a significant positive effect on GHG reporting
H3: The number of commissioners has a significant positive effect on GHG reporting
H4: The measure of the independence of the board of commissioners has a significant positive effect on GHG reporting
H5: The size of the audit committee has a significant positive effect on GHG reporting
H6: The sensitivity of the company has a significant positive effect on GHG reporting
H7: The company sensitivity significantly modifies the influence of H1 - H5

3. Research Methodology

3.1. Sample Selection

This study attempts to predict the parameters studied for public companies listed on the Indonesia Stock Exchange. To limit the extent of the variables under investigation, only public companies are listed in the annex of the IDX fact book 2017 and publish annual reports for 2017. The selection of companies as samples is complemented by confirming issuers with delisting companies with new issuers and issuers. This process has produced 390 sample units of companies with sufficient data. This study attempts to predict the parameters studied for public companies listed on the Indonesia Stock Exchange. To limit the extent of the variables under investigation, only public companies are listed in the annex of the IDX fact book 2017 and publish annual reports for 2017. The selection of companies as samples is complemented by confirming issuers with delisting companies with new issuers and issuers. This process has produced 390 sample units of companies with sufficient data.

3.2. Variables Measurement

1. GHGDISC
   a. Meaning (type): number of narratives for disclosure of greenhouse gas (bound)
   b. Measurement: the number of narratives related to greenhouse gases found with an infinite 0 - positive scale
c. Explanation: this variable was found with the help of TMAILC (Text Mining Analysis Indonesian Listed Company) online software. The calculated narrative is a narrative that contains the following keywords: greenhouse, climate change, global warming, CO2, carbon, methane, CH4, nitrous oxide, N2O, chlorofluorocarbon, CFC, SF6, and NF3. These keywords are developed from a list of GHG emissions that need to be inventoried by the UNFCCC (CO2, CH4, N2O, HFCs, PFCs, SF6, and NF3). Only the specified keywords can be obtained.

2. DIRSIZE
   a. Meaning (type): number of company directors (free)
   b. Measurement: the number of people who occupy directors’ positions in companies with a 0 - positive scale is infinite
   c. Explanation: this variable is obtained from secondary data. Variables other than COMMSIZE that describe a measure of performance effectiveness in corporate governance.

3. INDDIR
   a. Meaning (type): number of independent or unaffiliated company directors (free)
   b. Measurement: the number of people occupying independent directors with an infinite scale of 0 - positive
   c. Explanation: this variable is obtained from secondary data. Variables other than INDCOMM and AUDCOMM that describe independence in corporate governance.

4. COMMSIZE
   a. Meaning (type): number of company commissioners (free)
   b. Measurement: the number of people who occupy directors’ positions in companies with a 0 - positive scale is infinite
   c. Explanation: this variable is obtained from secondary data. Variables other than DIRSIZE that describe measures of effectiveness in corporate governance.

5. INDCOMM
   a. Meaning (type): number of independent commissioners of the company (free)
   b. Measurement: the number of people who occupy the position of independent commissioners with a scale of 0 - positive is infinite
   c. Explanation: this variable is obtained from secondary data. Variables other than INDDIR and AUDCOMM that describe independence in corporate governance.

6. AUDCOMM
   a. Meaning (type): number of members of the company audit committee (free)
   b. Measurement: the number of people who occupy the position of audit committee members with a 0 - positive scale is infinite
   c. Explanation: this variable is obtained from secondary data. Variables other than INDDIR and INDCOMM that describe independence in corporate governance.

7. SENS
   a. Meaning (type): sensitivity to GHG problems (free, moderating)
   b. Measurement: assessment of the company’s sensitivity to GHG issues with binary scales 0 and 1
   c. Explanation: this variable is obtained from secondary data. Value 1 means that the company has special attention to GHG issues within the company’s operational scope. Conversely, a value of 0 means that the company does not have that concern. This assessment is based on research referred to, namely the type of industry based on SIC (Standard Industrial Classification). Industrial code with number 0, d. 3 is given a value of 1 while the other is given a value of 0.

8. SIZE
   a. Meaning (type): company size (free, control)
   b. Measurement: the natural logarithm of the monetary value of the total assets of a company with a scale of 0 - positive is infinite
   c. Explanation: this variable is obtained from secondary data. Variables other than PROF and LEV which become control variables in the regression model are proposed.
9. PROF  
   a. Meaning (type): company profitability (free, control)  
   b. Measurement: the ratio of the company’s net profit to the total assets of a company with the scale of all real numbers  
   c. Explanation: this variable is obtained from secondary data. Variables other than SIZE and LEV which become control variables in the regression model are proposed.

10. LEV  
   a. Meaning (type): company capital structure (free, control)  
   b. Measurement: the ratio of total liabilities to total equity of a company with an infinite scale of 0 - positive  
   Explanation: this variable is obtained from secondary data. Variables other than SIZE and PROF are the control variables in the regression model proposed.

3.3. Specification Model  

Based on the hypothesis proposed, this study uses one dependent variable GHGDISC, six independent variables: DIRSIZE, INDDIR, COMMSIZE, INDCOMM, AUDCOMM and SENS, and three control variables developed from the research referred to SIZE, PROF, LEV. So, to prove the H1 hypothesis d. H5 is proposed by the following multivariable linear regression model (then called Model 1):

$$\text{GHGDISC} = \alpha + \beta_1 \text{DIRSIZE} + \beta_2 \text{INDDIR} + \beta_3 \text{COMMSIZE} + \beta_4 \text{INDCOMM} + \beta_5 \text{AUDCOMM} + \beta_6 \text{SIZE} + \beta_7 \text{PROF} + \beta_8 \text{LEV} + \epsilon$$  

(1)

Whereas, to prove the hypothesis H1 d. H5 and H6 and H7 are proposed by multivariable linear regression models with moderating variables (then called Model 2 s.d. Model 6) as follows:

$$\text{GHGDISC} = \alpha + \beta_1 \text{DIRSIZE} + \beta_2 \text{INDDIR} + \beta_3 \text{COMMSIZE} + \beta_4 \text{INDCOMM} + \beta_5 \text{AUDCOMM} + \beta_6 \text{SENS} + \beta_7 \text{DIRSIZE*SENS} + \beta_8 \text{SIZE} + \beta_9 \text{PROF} + \beta_{10} \text{LEV} + \epsilon$$  

(2)

$$\text{GHGDISC} = \alpha + \beta_1 \text{DIRSIZE} + \beta_2 \text{INDDIR} + \beta_3 \text{COMMSIZE} + \beta_4 \text{INDCOMM} + \beta_5 \text{AUDCOMM} + \beta_6 \text{SENS} + \beta_7 \text{INDDIR*SENS} + \beta_8 \text{SIZE} + \beta_9 \text{PROF} + \beta_{10} \text{LEV} + \epsilon$$  

(3)

$$\text{GHGDISC} = \alpha + \beta_1 \text{DIRSIZE} + \beta_2 \text{INDDIR} + \beta_3 \text{COMMSIZE} + \beta_4 \text{INDCOMM} + \beta_5 \text{AUDCOMM} + \beta_6 \text{SENS} + \beta_7 \text{COMMSIZE*SENS} + \beta_8 \text{SIZE} + \beta_9 \text{PROF} + \beta_{10} \text{LEV} + \epsilon$$  

(4)

$$\text{GHGDISC} = \alpha + \beta_1 \text{DIRSIZE} + \beta_2 \text{INDDIR} + \beta_3 \text{COMMSIZE} + \beta_4 \text{INDCOMM} + \beta_5 \text{AUDCOMM} + \beta_6 \text{SENS} + \beta_7 \text{INDCOMM*SENS} + \beta_8 \text{SIZE} + \beta_9 \text{PROF} + \beta_{10} \text{LEV} + \epsilon$$  

(5)

$$\text{GHGDISC} = \alpha + \beta_1 \text{DIRSIZE} + \beta_2 \text{INDDIR} + \beta_3 \text{COMMSIZE} + \beta_4 \text{INDCOMM} + \beta_5 \text{AUDCOMM} + \beta_6 \text{SENS} + \beta_7 \text{AUDCOMM*SENS} + \beta_8 \text{SIZE} + \beta_9 \text{PROF} + \beta_{10} \text{LEV} + \epsilon$$  

(6)

4. Result and Discussion  

The findings of this study are that annual report data is more widely publicized by companies in sensitive industrial types (0 dd. 3) than those of insensitive industries (4 s.d. 9). PT Perusahaan Gas Negara (Persero) Tbk. (PGAS) reports the most data, which is 49 times followed by PT Indocement Tunggal Prakarsa Tbk. (INTP) which is 37 times. Both of these values have distances from the average (only for GHGDISC values greater than 1, which is 4.37) of 5.88 and 4.3 times standard deviation (7.59). The next highest value is 19 times (SGRO and ITMG), which is less than twice the standard deviation. 217 narratives were found in sensitive code companies, and half (111 narratives) in other companies. Among companies that are insensitive, companies in the transportation & public utilities sector (code 4) provide the highest value with 12.67 findings per company. In general, the collective average value of 4.37 findings per company is not much different from the sectoral average value (based on sensitivity) with 4.34 for sensitive companies and 4.44 for those who do not. The difference in
sectoral averages is caused by generally sensitive companies reporting more on GHG emissions narratives (50 companies) than those without (25). Overall, narrative data processing has found 75 companies with a minimum GHGDISC value of one, with more sensitive companies (66% with 34%). That amount is equal to around 19% of the total 390 samples of the company studied. From the whole sample, it can also be found that around 24% of 210 companies are sensitive and 14% of 180 companies are insensitive which have at least one GHGDISC value. This could mean two things: the company’s conservatism in compliance with regulations or company commitments is not enough. Summing up from Razeed (2010) conservatism of compliance means that companies only report what they feel is necessary in a simple manner based on general guidelines that are practically used. While continuing Michelon, et al. (2015, in Nasution and Adhariani, 2016), looking at a percentage that is not much different (28%, 24%, and 32% separate CSR reporting numbers) the issue of commitment can also be concluded the same in this study. Cho, et al. (2012, in Nasution and Adhariani, 2016) use separate CSR reporting as a sign that the company wants to increase its accountability. The principle is in line with the purpose of processing narrative data carried out by this study. More detailed distribution of industrial data can be seen in Table 1. Meanwhile, Tables 2 and 3 each show descriptive statistics for the entire sample and sample with the narrative that was successfully found with a minimum value of one (see table 2 and table 3 for descriptive statistics).

Table 1. Sample Distribution Based on Industry Type (SIC)

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<td>37</td>
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<td>390</td>
</tr>
<tr>
<td>%</td>
<td>3.33</td>
<td>12.56</td>
<td>23.33</td>
<td>14.62</td>
<td>14.36</td>
<td>9.49</td>
<td>12.31</td>
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<tr>
<td>Total</td>
<td>13</td>
<td>49</td>
<td>91</td>
<td>57</td>
<td>56</td>
<td>37</td>
<td>48</td>
<td>30</td>
<td>9</td>
<td>390</td>
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<td>%</td>
<td>3.33</td>
<td>12.56</td>
<td>23.33</td>
<td>14.62</td>
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<td>9.49</td>
<td>12.31</td>
<td>7.69</td>
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Table 2. Descriptive Statistic (n = 390)

<table>
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<th>Std. Deviation</th>
<th>Minimum</th>
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<td>3.734</td>
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<td>0.141</td>
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<td>3.500</td>
<td>1.769</td>
<td>2.000</td>
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<td>6.000</td>
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<tr>
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<td>12.158</td>
<td>-59.620</td>
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Table 3. Descriptive Statistic (n = 75)

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<td>7.59</td>
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<td>3.18</td>
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4.1. Correlation Analysis

Correlation analysis aims to determine the relationship between the variables studied in samples that are found or processed individually. This study uses Pearson’s product-moment as a measure of the correlation coefficient shown in the form of an i x i matrix, with i is the number of variables studied. Based on the correlation matrix table (table 4.4), it can be seen that the number of directors, the size of independent directors, the number of commissioners, and the size of the audit committee have a very significant relationship with the number of GHG emissions disclosures found. At a significance level of less than 1%, the number of directors, the number of independent directors, and the number of commissioners are related to the number of disclosures of 0.197, -0.135, and 0.198 respectively. At the significance level of less than 5%, the size of the audit committee has a relationship with the amount of disclosure of 0.125. Firm size and profitability have a relationship as a control variable to the number of disclosures of 0.242 and 0.114 at the level of confidence of each less than 1% and less than 5%. The capital structure and the number of independent commissioners have a relationship inversely proportional to the amount of disclosure. However, in this study, no significant relationship (more than 10%) was found for both (see table 4).

<table>
<thead>
<tr>
<th>GHGDISC</th>
<th>DIRSIZE</th>
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<th>COMMSIZE</th>
<th>INDCOMM</th>
<th>AUDCOMM</th>
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<td>INDDIR</td>
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<td>-0.390***</td>
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</tr>
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<td>(0.000)</td>
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<tr>
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<td>0.188***</td>
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<td>(0.139)</td>
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<tr>
<td>AUDCOMM</td>
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<td>0.214***</td>
<td>-0.063</td>
<td>0.194***</td>
<td>0.041</td>
<td>1.000</td>
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<tr>
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<td>(0.214)</td>
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<td>SIZE</td>
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<td>0.550***</td>
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<td>(0.000)</td>
<td>(0.000)</td>
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<td>PROF</td>
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<td>0.214***</td>
<td>0.019</td>
<td>0.073</td>
<td>0.210***</td>
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</tr>
<tr>
<td>(0.024)</td>
<td>(0.000)</td>
<td>(0.048)</td>
<td>(0.000)</td>
<td>(0.705)</td>
<td>(0.150)</td>
<td>(0.000)</td>
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<td>LEV</td>
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<td>0.179***</td>
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<td>-0.105**</td>
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<td>(0.745)</td>
<td>(0.011)</td>
<td>(0.000)</td>
<td>(0.229)</td>
<td>(0.840)</td>
<td>(0.728)</td>
<td>(0.093)</td>
<td>(0.038)</td>
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</tr>
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</table>

P-values are in parentheses, asterisks are significant in P-values with * = p <0.1, ** = p <0.05, *** = p <0.01

The results of this analysis support the significance of four of the five initial hypotheses (H1, H2, H3, H5). This means that individually (specifically one variable) the company in the sample takes advantage of the company’s organs (number of directors, number of independent directors, number of commissioners, and size of the audit committee) to pay attention to the accountability of GHG emissions issues.

4.2. Regression Analysis

Based on the results of data processing with STATA, the six models have a coefficient of determination that is not much different (0.103 for Model 1, d. 0.109 for Model 2). For the five hypotheses (H1 d. H5), only more H3 and H4 can be proven by five of the six regression models proposed showing significance. Table 5 shows the findings that the number of commissioners has a positive and significant effect (P-value of less than 5%) in Models 1, 2, 3, 5 and 6 of the number of sample disclosures processed from TMAILC. The consistency of the number of commissioners regression coefficients appears on the five models. While the size of independ-
ent commissioners was found to have a negative and significant effect (P-value less than 5%) in Models 1, 2, 3, 4, and 6. In addition to the strong significance, all (six) proposed models succeeded in providing inversion consistent in the form of negative regression coefficients. The level of significance of company sensitivity was found to modify the influence of four of the five corporate governance variables proposed. Although separately only being able to explain the amount of disclosure significantly in Models 3 and 4 only, the type of industry as a proxy for sensitivity of the company is able to significantly modify the influence of the number of directors, independent director size, and number of commissioners with a P-value of less than 5% in Model 2, 3, and 4. In models 5 and 6, the sensitivity of each moderates the effect of independent commissioner size with a P-value of less than 10% and does not indicate moderation in the influence of the size of the audit committee. So that H7 can be proven in Models 2, 3, 4, and 5. Individually, the significance of the sensitivity effect has been found in Models 3 and 4 with a P-value of less than 5%.

Table 5. Multivariate Linear Regression

<table>
<thead>
<tr>
<th>Variabel</th>
<th>Model GHGDISC</th>
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</thead>
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<tr>
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<td>1</td>
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<tr>
<td>DIRSIZE</td>
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<td>INDDIR</td>
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<td>COMMSIZE</td>
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<td>(2.07)</td>
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<td>INDCOMM</td>
<td>-2.539**</td>
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<tr>
<td>AUDCOMM</td>
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<td></td>
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<tr>
<td>DIRSIZE_SENS</td>
<td>0.356**</td>
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<td></td>
<td>(2.03)</td>
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<tr>
<td>INDDIR_SENS</td>
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<tr>
<td>COMMSIZE_SENS</td>
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<td>INDCOMM_SENS</td>
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<td></td>
<td>(-1.72)</td>
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<tr>
<td>AUDCOMM_SENS</td>
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<tr>
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<td>Included</td>
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<tr>
<td></td>
<td>N</td>
</tr>
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</table>

The t-value is displayed in brackets, significance * = p < 0.1, ** = p < 0.05, *** = p < 0.01

4.3. Proof of Hypothesis

The results of this regression analysis summarize the proof of the hypothesis after considering the significance of each regression coefficient in Table 6.


### Tabel 6. Proof of Hypothesis

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
</tr>
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<tbody>
<tr>
<td>H1</td>
<td>Rejected</td>
<td>Rejected</td>
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<td>Rejected</td>
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<td>Rejected</td>
</tr>
<tr>
<td>H2</td>
<td>Rejected</td>
<td>Rejected</td>
<td>Accepted</td>
<td>Rejected</td>
<td>Rejected</td>
<td>Rejected</td>
</tr>
<tr>
<td>H3</td>
<td>Accepted</td>
<td>Accepted</td>
<td>Accepted</td>
<td>Ditolak</td>
<td>Accepted</td>
<td>Accepted</td>
</tr>
<tr>
<td>H4</td>
<td>Rejected</td>
<td>Rejected</td>
<td>Rejected</td>
<td>Rejected</td>
<td>Rejected</td>
<td>Rejected</td>
</tr>
<tr>
<td>H5</td>
<td>Rejected</td>
<td>Rejected</td>
<td>Rejected</td>
<td>Rejected</td>
<td>Rejected</td>
<td>Rejected</td>
</tr>
<tr>
<td>H6</td>
<td>Tidak diteliti</td>
<td>Rejected</td>
<td>Accepted</td>
<td>Rejected</td>
<td>Accepted</td>
<td>Rejected</td>
</tr>
<tr>
<td>H7</td>
<td>Tidak diteliti</td>
<td>Diterima</td>
<td>Accepted</td>
<td>Accepted</td>
<td>Accepted</td>
<td>Rejected</td>
</tr>
</tbody>
</table>

**Description:**
1. H1 is tested with DIRSIZE variables on all models.
2. H2 is tested with INDDIR variables on all models.
3. H3 is tested with COMMSIZE variables on all models.
4. H4 is tested with INDCOMM variables on all models.
5. H5 is tested with the AUDCOMM variable on all models.
6. H6 is tested with the SENS variable in Model 2.
7. H7 is tested by the interaction of SENS variables on the DIRSIZE, INDDIR, COMMSIZE, INDCOMM, and AUDCOMM variables on Model 2.

### 5. Conclusions

This study tries to find out how the influence of the effectiveness and independence of corporate organs on the disclosure of company GHG emissions. This research is essential because non-financial information is a strategic issue in reporting company performance (Bassen & Kovács, 2008; Luhn et al., 2017). This is important because transparency over non-financial information can reduce negative externalities in the form of uncontrolled GHG emissions. The role of the director and commissioner of the company is to manage the company to achieve various objectives. In the era of information technology sophistication, this goal is not only focused on the wealth of the company and its shareholders. However, there is involvement of the community and the government in promoting sustainable development related to efforts to control emissions (Mukhlis, 2009). From here, entrepreneurs need to apply identification and proper stakeholder management to improve reputation and maximize company value (Anggraeni, 2015), gain legitimacy (Mitchell, et al., 1997), attract new investors through the socially responsible investments mechanism (Zulkafli, et al., 2017), or to implement the altruist motive as remuneration.

The study was conducted on 390 companies listed on the Indonesia Stock Exchange in 2017. This study has undertaken a correlation test and has developed a regression model with mixed results. The results show only the number of commissioners, the size of the board of commissioners’ independence, and the moderation of sensitivity that can explain the consistent significance that is on all but one proposed model. Of the three variables, only the measure of the independence of the commissioners rejects the initial hypothesis with a regression coefficient that is significant at the negative value. In this study, the effectiveness represented by the number of commissioners positively influences the disclosure of GHG emissions narratives in public companies in Indonesia for specific models according to the board size proposed by Solikhah & Winarsih (2016) and Giannarakis (2014). Then, the independence represented by a measure of the independence of the board of commissioners negatively influences the disclosure of narrative GHG emissions in public companies in Indonesia for specific models following the results of research by Solikhah & Winarsih (2016). The sensitivity of the company represented by the type of company industry is found to influence the disclosure of GHG emissions narratives in public companies in Indonesia for specific models following the industry profile in Frendy & Kusuma (2011) and Hackston & Milne (1996). And the moderation of the sensitivity of the company represented by the type of company industry was found to influence the disclosure of GHG emissions narratives in public companies in...
Indonesia for specific models. Whereas, for other variables, no significant influence was seen, which could accept the initial hypothesis. However, the regression coefficients on these variables also cannot necessarily reject the initial hypothesis. In general, variables with weak significance can be considered as findings that reject the initial hypothesis. That is, this study methodologically managed to answer the research problems as follows:

1. The effectiveness represented by the number of directors does not show a significant effect on the disclosure of public company GHG emissions narratives in Indonesia
2. The effectiveness represented by the number of commissioners shows a significant positive effect on the disclosure of narratives of GHG emissions of public companies in Indonesia in five of the six proposed analysis models
3. Independence represented by a measure of the independence of directors only shows a significant positive effect on the disclosure of narratives of GHG emissions of public companies in Indonesia in one of the six proposed analysis models
4. Independence represented by a measure of the independence of the board of commissioners shows a significant positive effect on the disclosure of narratives of GHG emissions of public companies in Indonesia in five of the six models of analysis proposed.

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Keputusan Direksi PT Bursa Efek Jakarta.

Peraturan Otoritas Jasa Keuangan.

Peraturan Presiden Republik Indonesia.

Surat Edaran Otoritas Jasa Keuangan.

Undang-Undang Republik Indonesia.
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Abstract. This study was conducted to determine the effect of research and development intensity (RNDI) on firm performance (FP) with green product innovation (GPI) as an intervening variable. Companies which are always innovative with market developments will get two benefits. First, achieving competitive advantage. Second, obtaining economic benefits, therefore it will increase firm performance. This study uses 170 company observations from listed companies in Indonesia Stock Exchange at 2013-2017 as sample of research. The samples were chosen by purposive sampling method and were analyzed by path analysis method using STATA software. The result shows that RNDI has an effect on FP, RNDI has an effect on GPI, and GPI has an effect on FP. They indicate that GPI can mediate the effect of RNDI on FP in partial.

Keywords: R&D intensity, green product innovation, firm performance


JEL Classifications: Q01, L25, O30.

1. Introduction

Rapid global economic growth makes environmental problems as a key and the main focus of sustainable economic development (e.g. Stjepanović et al., 2017; Tvaronavičienė, 2018; Lavrinenko et al., 2019; Fatoki, 2019; Masood et al., 2019; Kormishkina et al., 2019; Chehabeddine, Tvaronavičienė, 2020; Vigliarolo, 2020; Energy Transformation towards Sustainability, 2020). To overcome these environmental problems, the United Nations launched Sustainable Development Goals (SDGs) number 9, namely industry, innovation and infrastructure which are important points in the development of sustainable industries, encouraging innovation and strengthening infrastructure. The Indonesian government on 2014 also passed Law number 3 of 2014 concerning industry which specifically regulates green industry (articles 77-83). One company that has a high innovation culture is PT Petrokimia Gresik which is the largest fertilizer producer in Indonesia. Innovation has led PT Petrokimia to be more effective and efficient. In 2016, the realization of savings from innovation activities amounted to Rp 278.8 billion.

Regarding environmental concerns, several companies have implemented green innovation in their industry and have been proven to have a good impact on the environment and the company itself. Huang, et al. (2016) defines green product innovation as a new product or improvement from previous products that reduces the impact of various environmental problems that arise in the product life cycle. Green product innovation is one of the applications of legitimacy theory. This study found that green product innovation has a positive influence on company performance. Companies with green product innovation will increase customer value and
legitimacy from the community, thereby gaining new markets that will increase sales. These results support previous research, namely Ar (2012); Cai and Li (2018); Chan, et al. (2016); Gluch et al. (2009); Palmer and Truong (2017). In contrast, this study does not agree with Dangelico et al. (2013) who found that green product innovation had no significant effect on company performance. Green product innovation requires a long time so that the impact is felt by the company.

Green innovation as one of the important points in SDGs, usually begins with research and development (R&D) activities. The results of a survey of 1,320 companies in Indonesia conducted by the World Bank in 2015 found that only 1.9% of Indonesian companies issued funds for research and development. This amount is far behind when compared to neighboring countries and developing countries too, Malaysia, which is equal to 10.5% of companies. While this research found that companies that actively undertake R&D activities will find it easier to develop products by paying attention to environmental problems that arise. These results are in line with the study of De Medeiros, et al. (2014), Huang, et al. (2016), and Tumelero, et al. (2019) who managed to find a positive effect of the intensity of R&D on green product innovation. These results also support the RBV theory that a company’s internal capabilities such as R&D will encourage the creation of competitive advantages, one of which is green product innovation.

In addition to having an impact on green product innovation, the intensity of R&D also has a positive influence on company performance. The study found an increase in funding for R&D resulted in an increase in the company’s ability to conduct development and research to create new products that are in line with the demands of the community or improve existing processes. This will make the company’s sales increase and there will be savings on the improved process. It also fulfills the interests of stakeholders so that the company can survive in the market and is always adaptive. This study supports the research of da Silva et al. (2015); Gu (2016); Jaisinghani (2016); Mulero Mendigorri, et al. (2016) which revealed the intensity of R&D has a positive effect on company performance. In contrast, this study does not agree with Tahat, et al. (2018) who did not find any influence from these variables.

Theoretically, this research contributes to the literature through several aspects. First, this study expands research on innovation by using green product innovation. Second, conducting research related to the mediating role of the green product innovation variable in the relationship of R&D intensity and company performance that has not been studied before. This study shows that green product innovation can partially mediate these two variables. Third, based on the R&D theory, this study looks at its impact on company performance in the coming year.

2. Literature Review

2.1. Legitimacy Theory

According to O’Donovan (2002), company must ensure that its operations have been running smoothly continuously and in accordance with existing norms in society. In the legitimacy theory, the company will focus on the community and its environment and will voluntarily report its activities (Deegan, 2004). The differences that occur between business actions and people’s expectations (legitimacy gap) can cause problems for companies (Sethi, 1977). There are two ways for companies to gain legitimacy (Dowling & Pfeffer, 1975). First, there is a compatibility between the company’s operational activities and the value system prevailing in the community. Second, companies need to express social value in their activity reports. Green product innovation is one way for companies to gain legitimacy from the public.

2.2. Stakeholder Theory

Freeman (2010) states that stakeholder theory is defined as an individual or group of people who can influence or can be influenced by a business business. Based on this theory, a company must pay attention to the interests of stakeholders because the company does not operate alone (Ghozali & Chariri, 2007; Cardoso et al., 2018).
The intensity of research and development is expected to reflect companies that are always developing and strive for going concern. Likewise in green product innovation, stakeholders do not need to worry because the innovations made by the company do not pay attention to the environment.

2.3. Resource Based View (RBV) Theory

Resource-based view (RBV) theory is a theory used to understand how companies achieve sustainable competitive advantage through the company’s resources. RBV theory focuses on the concept of corporate attributes that are difficult to replicate so as to produce superior performance and competitive advantage (Barney, 1991). Company resources must have the following criteria in order to achieve competitive advantage and sustainable performance, including valuable, scarce, imperfectly imitated, and unsubstituted (Barney, 1991).

2.4. Effect of Research and Development Intensity on Company Performance

Companies usually carry out R&D activities to improve product quality and adjust to the changing market needs. The purpose of the company in order to meet the interests of stakeholders so that the company can survive and compete. This is in line with the application of stakeholder theory. However, the costs incurred for R&D activities in companies cannot be classified as small. According to Sougiannis (1994), it takes about seven years for expenses for R&D activities to produce returns of up to 200 percent.

Even so the costs incurred by the company to conduct R&D will not be in vain. Companies that carry out R&D activities will get two benefits, namely to improve their innovation capability and absorptive capacity (Dai and Yu, 2013). Through this increase in absorptive capacity, the intensity of R&D can improve company performance (da Silva, et al., 2015; Gu, 2016; Jaisinghani, 2016; Mulero Mendigorri, et al., 2016). Based on this hypothesis proposed in this study as follows:

**H1. The intensity of research and development influences company performance**

2.5. Effect of Research and Development Intensity on Green Product Innovation

Horbach (2008), in his study of the determinants of environmental innovation, stated that organizations that want to succeed in developing new environmentally friendly products must invest in tools and methods that can support this goal. Huang, et al. (2016) suggest managers evaluate the type and amount of investment in R&D needed to develop green product innovation. Block (2012) argues that investment in R&D can affect a company’s ability to develop new products and create and adopt innovative technologies that can increase its competitive advantage. This is consistent with the theory of resource-based view, which states that internal resources owned by companies such as R&D activities can increase competitive advantage in companies, one of which is green product innovation. Several studies have found that when research and development is higher, the better also the impact on green product innovation (De Medeiros, et al., 2014; Huang, et al., 2016; Tumeler, et al., 2019). Thus, the hypothesis proposed in this study is as follows:

**H2. The intensity of research and development has an effect on green product innovation.**

2.6. Effect of Green Product Innovation on Company Performance

Green product innovation is defined as product development by reducing negative impacts and risks caused to the environment (Lin, et al., 2013). Guoyou et al. (2013) consider environmentally friendly innovation as an instrument to improve the company’s environmental management process, and related to various changes that occur that result in a reduction in environmental burden. Companies that implement green product innovation are expected to minimize the resources used and prevent waste in the product disposal phase. In addition, green product innovation has an impact on competitive advantage and corporate image (Kam-Sing Wong, 2012). The existence of good environmental performance, high efficiency, and competitive advantage will encourage in-
vestors to invest (Agustia et al., 2019) including environmental problems in the company’s business activities is one way to add value to customers (Hansmann and Claudia, 2001). This is in line with the application of the theory of legitimacy that the products produced do not interfere with the community or are environmentally friendly. Research Ar (2012); Cai and Li (2018); Chan, et al. (2016); Gluch et al. (2009); Palmer and Truong (2017); Singh, et al. (2016) has also proven that green product innovation has a good impact on the company’s business. Based on this, the hypothesis proposed in this study is as follows:

**H3. Green product innovation influences company performance.**

### 2.7. Effect of Research and Development Intensity on Company Performance with Green Product Innovation as Intervening Variables

Based on stakeholder theory, a company must be able to fulfill all stakeholder interests. One of the stakeholders’ interests is to want the company to remain going concern. R&D activities are the company’s efforts to stay afloat and compete by continuing to innovate. Although the costs incurred for these activities are usually high, R&D activities have a positive impact on company performance (da Silva, et al., 2015; Gu, 2016; Jaisinghani, 2016; Mulero Mendigorri, et al., 2016).

R & D activities can also support the existence of green product innovation in companies (De Medeiros, et al., 2014; Huang, et al., 2016; Tumelero, et al., 2019). Investment in R&D can influence companies in developing new products. This is in line with the RBV theory which relies on internal resources. Green product innovation is also one application of the theory of legitimacy, which states that companies must act in accordance with norms and rules in society. In this case the company considers the environmental impact received by the community. The existence of environmentally friendly innovations can also increase public confidence in consuming company products that will have an impact on the performance of the company itself (Ar, 2012; Cai & Li, 2018; Chan, et al., 2016; Singh, et al., 2016). Based on the description above, the research hypothesis proposed is as follows:

**H4. The intensity of research and development influences company performance through green product innovation.**

### 3. Research Methodology

#### 3.1. Research Design

This study uses quantitative approach which use 170 companies listed in Indonesian Stock Exchange 2013-2017 as a sample. Moreover, this study also use path analysis and sobel-test for hypotheses testing. Following are the linear regression equation:

\[
F_{Pi,t+1} = \alpha + \beta_1 RNDI_{i,t} + e \\
GPI_{i,t} = \alpha + \beta_1 RNDI_{i,t} + e \\
F_{Pi,t+1} = \alpha + \beta_1 GPI_{i,t} + e \\
F_{Pi,t+1} = \alpha + \beta_1 RNDI_{i,t} + \beta_2 GPI_{i,t} + e
\]

Notes:
- FP : Firm performance
- RNDI : Research and development intensity
- GPI : Green product innovation
- \( \alpha \): Constanta
- \( \beta \): Coefficient
- e : Error
3.2. Definition of Operational Variables

3.2.1. Intensity of Research and Development

The intensity of R&D is all expenditures that companies use to create new products or processes, or improve existing products, or discover new knowledge that will be useful in the future (Kieso, 2014). The ratio of the R&D intensity used is the burden of R&D divided by sales (Jaisinghani, 2016; Vithessonthi & Racela, 2016).

3.2.2. Green Product Innovation

Green product innovation is a diverse process that has three key environmental focuses, namely raw materials, energy, and pollution (Dangelico & Pujari, 2010). To find a company implementing green product innovation, there are ten indicators used to measure it. These indicators include: substitution of raw materials that cause pollution, substitution of hazardous raw materials, designs that focus on reducing resource consumption at the production stage, designs that focus on reducing waste generated at the production stage, designs that focus on product improvement and decomposition, design which focuses on increasing product use, designs that focus on increasing product recycling, product life cycle analysis to improve product design, expanding the scope of the market for environmentally friendly products, and improving manufacturing technologies for environmentally friendly products. Based on these indicators, the total disclosed divided by the number of indicators is 10 (Huang, et al., 2016).

3.2.3. Company Performance

The company’s performance is the result of the company’s operational activities in utilizing available resources. This study uses a financial perspective to measure company performance. According to the Indonesian Institute of Accountants (2009: 4), company performance can be measured by analyzing and evaluating the company’s financial statements. Return on assets (ROA) size to be used is the ratio of net income to assets (Jaisinghani, 2016). This study uses a one-year gap, to calculate company performance due to the nature of the independent variables.

4. Result and Discussion

4.1. Results

Table 1. Results of Regression Analysis (Robust)

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FP</td>
<td>GPI</td>
<td>FP</td>
<td>FP</td>
</tr>
<tr>
<td>RNDI</td>
<td>3.259***</td>
<td>3.136***</td>
<td>2.973***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(6.52)</td>
<td>(5.99)</td>
<td>(5.90)</td>
<td></td>
</tr>
<tr>
<td>GPI</td>
<td></td>
<td>0.153***</td>
<td>0.091**</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(3.44)</td>
<td>(2.36)</td>
<td></td>
</tr>
<tr>
<td>_cons</td>
<td>0.057***</td>
<td>0.340***</td>
<td>0.019</td>
<td>0.026</td>
</tr>
<tr>
<td></td>
<td>(7.99)</td>
<td>(23.90)</td>
<td>(1.14)</td>
<td>(1.54)</td>
</tr>
<tr>
<td>r2</td>
<td>0.232</td>
<td>0.066</td>
<td>0.077</td>
<td>0.257</td>
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<tr>
<td>N</td>
<td>170</td>
<td>170</td>
<td>170</td>
<td>170</td>
</tr>
</tbody>
</table>

* t statistics in parentheses, * p < 0.1, ** p < 0.05, *** p < 0.01

Table 1 which is contain of the regression analysis result shows that all hypotheses have significant value less than 0.005 therefore all hypotheses are accepted.
Based on the path analysis in Figure 1, green product innovation mediates the relationship between R&D intensity and company performance partially. This is because the intensity of R & D and green product innovation influences company performance, as well as the intensity of R & D influences green product innovation. In accordance with the theory of Baron and Kenny (1986) which states that partial mediation occurs when the independent variable is able to influence the dependent variable without going through the intervening variable (path c'). The direct effect of the model (line c') is 0.439 while the indirect effect (line a x b) is 0.042. This is also supported by the sobel test (Table 2) which yields a significance of less than 0.05 (p-value 0.032). Based on these results, the H4 which states that the intensity of research and development affect the company’s performance through green product innovation is accepted.

Table 2. Sobel Test

<table>
<thead>
<tr>
<th></th>
<th>Input</th>
<th>Test Statistic</th>
<th>Std. Error</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>3,136</td>
<td>2.1481</td>
<td>0.1329</td>
<td>0.0317</td>
</tr>
<tr>
<td>b</td>
<td>0.091</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sa</td>
<td>0.524</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sb</td>
<td>0.039</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 1. Path Analysis

4.2. Discussion

4.2.1. Effect of Research and Development Intensity on Company Performance

Based on the results of statistical analysis, this study found that the intensity of research and development had a positive and significant effect on company performance. This can be seen from the test results that show a significance value of 0.000 smaller than the significance level that has been determined that is 5%.

R&D activities in a company are also known as high-risk and risky activities. Therefore, this activity requires special attention from the company. Managers should view R&D as an investment and not as a burden. That is because R&D generally provides benefits not in the same year, but in the following year. This is in accordance with one of the characteristics of research and development activities that takes a long time starting from the formulation of ideas to the manufacture of products. When companies can use funds for R&D effectively and efficiently, it will benefit the company. Increased investment in R&D results in an increase in the company’s ability to carry out development and research to create new products that are in accordance with the demands of the community or improve existing processes. This will make the company increase its sales and can reduce expenses due to savings on improved processes. When there is an increase in sales and savings, the company will get higher profits and better company performance. This study supports the research of da Silva, et al. (2015); Gu (2016); Jaisinghani (2016); Mulero Mendigorri, et al. (2016) which states that the intensity of R & D has a positive effect on company performance. In contrast, this study does not agree with the research of Tahat, et al. (2018) which revealed that there was no influence on these variables.
4.2.2. Effect of Research and Development Intensity on Green Product Innovation

Based on the results of statistical analysis, this study found that the intensity of research and development had a positive and significant effect on green product innovation. This can be seen from the test results which show that the significance value of 0.001 is smaller than the significance level that has been determined that is 5%.

Research and development activities are closely related to the innovations produced. Companies that actively carry out research and development activities will find it easier to develop products. The company will also pay attention to problems arising from product innovation as well as environmental sustainability. Product innovation in companies that have a goal of sustainable development and attention to environmental sustainability is called green product innovation. In accordance with the theory of resource-based view, companies that have internal resources in this case are research and development activities with rare, unique, non-replicable and un-substituted characteristics, which will support the creation of competitive advantage. Green product innovation is a form of excellence owned by companies and not owned by competitors. However, the nature of research and development activities that spend time, the results are uncertain and risky require special attention from the company. Companies must always evaluate the types of R&D activities and the amount of R&D costs needed to develop green product innovation. Companies that succeed in doing this will be easier to develop green product innovation.

Thus, this study supports the research of De Medeiros, et al. (2014); Huang, et al. (2016); Tumelero, et al. (2019) which revealed that the intensity of research and development had a positive effect on green product innovation.

4.2.3. Effect of Green Product Innovation on Company Performance

Based on the results of statistical analysis, this study found that green product innovation had a positive and significant effect on company performance. This can be seen from the test results that show that the significance value of 0.000 is greater than the significance level that has been determined that is 5%.

The issue of environmental sustainability is currently one of the focuses of the company, including in terms of innovation. The existence of green product innovation can be a company advantage in a competitive environment. Including environmental issues in the company’s business activities is one way to add value to customers. These results are in accordance with studies from Hansmann and Claudia (2001). In addition, based on the theory of legitimacy, green product innovation can also make companies gain legitimacy from the public. This is because green product innovation is evidence that companies innovate according to existing norms in society, and pay attention to environmental sustainability in their business.

As a result of increasing customer value and legitimacy from the public, companies with green product innovation will gain a new market. This new market is very profitable. The company will get more customers and of course increase sales of the product. Increased sales cause profits to increase. Based on profitability ratios, an increase in profit can be interpreted as an increase in company performance. In addition, green product innovation will encourage efficient use of raw materials and be more energy efficient so that the costs incurred go down. Green product innovation will also lead companies to find new ways to turn waste into products that can be sold and increase revenue.

This study supports the research of Ar (2012); Cai and Li (2018); Chan, et al. (2016); Gluch et al. (2009); Palmer and Truong (2017); Singh, et al. (2016) which states that the existence of green product innovation has a positive effect on company performance. In contrast, this study does not agree with the research of Dangelico et al. (2013) which revealed that green product innovation had no significant effect on company performance.
4.2.4. Effect of Research and Development Intensity on Company Performance with Green Product Innovation as Intervening Variables

The results based on the path analysis show that there is an indirect influence by green product innovation on the relationship between research and development intensity and company performance.

Companies that actively carry out research and development activities will become more productive. Increased investment in research and development has resulted in an increase in the company’s ability to conduct research and development to create new products that are in accordance with the demands of the community or improve existing processes. This makes an increase in sales and savings that lead to increased company performance. This result is supported by stakeholder theory that research and development can meet the interests of stakeholders in order to remain going concern.

In addition, research and development activities are closely related to the green product innovation that is produced. Companies that spend more on research and development will have the ability to pay greater attention to the environment. As a result, it is easier for companies to produce product innovations that are beneficial to society and friendly to the environment. This result is supported by resource based view theory that companies with internal resources such as research and development will support the creation of competitive advantages in this case is green product innovation.

In addition, green product innovation that involves environmental elements in innovation results in increased customer value and legitimacy from the community. This result is in accordance with the theory of legitimacy. Through green product innovation, the company will gain more market share and increase sales so that the company’s performance also increases. This is also offset by the efficiency of raw materials and energy which makes cost reduction.

Based on the explanation above, it can be seen that green product innovation can mediate the relationship that occurs between the intensity of research and development on company performance.

Conclusions

Based on the results of the analysis and discussion described previously, it can be concluded as follows:

1. The intensity of research and development has a positive effect on company performance. This is because investment in research and development results in an increase in the company’s ability to conduct development and research to create new products or improve existing processes so that there is an increase in sales and savings resulting in increased company performance.

2. The intensity of research and development has a positive effect on green product innovation. Companies that actively conduct R&D activities will find it easier to develop products by taking into account environmental problems that arise.

3. Green product innovation has a positive effect on company performance. Companies with green product innovation will increase customer value and legitimacy from the public, thereby gaining new markets. The new market will make sales increase, followed by profits and company performance. This is supported by a decrease in costs due to the efficiency of raw materials and energy.

4. Green product innovation is proven to mediate the relationship between research and development intensity on company performance. This is because the greater intensity of R & D makes it easier for companies to involve environmental elements in green product innovation so as to increase market share and result in increased company performance.

The limitation in this study is that not many companies care about and report on the intensity of research and development. This is evidenced by the World Bank survey that in 2015 only 1.9% of companies in Indonesia issued funds for R&D. In addition, this study uses annual report data for green product innovation variables so that the perspective is from external parties. Based on the conclusions and limitations of this study, the advice
given by researchers is that researchers can then use primary data sources such as questionnaires for green product innovation variables so that the information obtained is more complete.

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Cardoso P.P., Swan, A.D., Mendes, R. (2018). Exploring the key issues and stakeholders associated with the application of rainwater systems within the Amazon Region. Entrepreneurship and Sustainability Issues, 5(4), 724-735. https://doi.org/10.9770/jesi.2018.5.4(2)


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DOES BIODIESEL INITIATIVE SAVE THE STATE BUDGET?

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Abstract. The Indonesian government has taken the initiative to gradually convert fossil based diesel fuels into biodiesel. This initiative aims to save the state budget as well as to encourage the use of renewable and environmentally friendly alternative energy. This study aims to analyze the effectiveness of the initiatives through investigating the effect of crude oil prices and implementation of the initiative on the price of crude palm oil as the raw material of biodiesel. The results of the study revealed that the crude palm oil increase as the crude oil price increase and the initiative in force, but not as much as the increase in the crude oil. The results imply that the initiative, at a certain level, able to save the state budget from subsidies for energy. This study used ordinary least square to analyze data from 2004, January until 2019, March.

Keywords: Crude Palm Oil (CPO), Crude Oil, Biodiesel (B20)

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JEL Classifications: Q01, L25

1. Introduction

Energy consumption increased in the word together with increase of population and scale of economic activities.

Energy consumption in Indonesia, similarly, increases rapidly in line with economic and population growth. Currently, Indonesia is still very much dependent on fossil fuel for its energy source and the non fossil alternative renewable energy has not been utilized optimally. Data of fossil energy reserves from Ministry of Energy and Mineral Resources (MEMR) shows that the proven reserve of oil is about 7,251.11 MMSTB and with an average production rate of 338 million barrels in 2016. Reserve oil will end in 9 years.

Crude oil import will increase in 2016, crude oil import amounted to 148 million barrels and will increase by 6.4 times to 953 million barrels in 2050. Oil import has become a top priority domestic oil fuels. Government should make sure it doesn’t impact to types and oil fuels products that are expected. In 2016, oil fuel is mostly consumed by transportation sector (80.7%), followed by industrial sector (8.1%), power plant (5.5%), others (3.9%), households (1.0%) and commercial (0.8%).

Currently, the largest share of oil fuels import is gasoline by 68.6%, followed by diesel oil (25.3%), avtur (4.4%), fuel oil (1.1%), and the rest is kerosene. Oil fuels import will increase from 3.64 million kl in 2016 to 29.14 million kl in 2050 or more than eight times in 34 years.
The data also shows that Indonesian’s final energy demand is still depend on oil. This data form Energy and Mineral state that energy demand will increase from 795 million BOE in 2016 to 4.569 million BOE by 2050. By 2050, the largest share of final energy demand is oil fuels at 40.1% from all energy.

Oil fuels (including biodiesel) demand increases with an average growth of 4.7% per year. In 2016 the demand reached 69.1 million kl and will increase to 326.6 million kl in 2050. This demand is mostly met by imports. Oil fuels import in 2016 reached 22.9 million kl and will increase by 6.3% per year to 182.3 million kl in 2050.

Change of international crude oil and fuel price impacts economic state of both, oil importing and exporting countries (e.g. Humbatova et al., 2019; Masood et al., 2019). When the crude oil price stays at around US$125 per barrel, Indonesia has to provide around 240 trillion Rupiah just for fuel subsidy. This will result in reduced government capacity to finance development programs in needed sectors such as health, education, basic human services, and infrastructures either in rural or in urban areas. It means that the government has very limited resources to stimulate and maintain productivity and economic growth.

In case to reduce fossil fuels, the Government would prepare a road map of the use of biofuels on the transportation of land, sea, air and rail transportation until 2050. The target of biofuels mixing in RUEN is consistent to the Biofuel Mandatory determined in Minister of Energy and Mineral Resources Regulation no. 12 of 2015. As a follow-up to the efforts energy diversification for the transportation sector, the Ministry of Energy and Mineral Resources issued Ministerial Regulation no. 25 of 2017 on the Acceleration of Gas Fuel Utilization for Road Transportation.

Main objective of the policy on the use of efficient technology and fuel substitution is to reduce oil fuels consumption, which, in the last few years, has played a major role in draining the country’s foreign exchange due to fuel imports. This paper seeks if this B20 policy effective to save state budget during crude oil consumption change with palm-oil-based biodiesel in Indonesia (as well see e.g. Areiqat et al, 2019).

2. Literature Review

The need for fuel in 2050 will decrease by 45% against the baseline. The decline was around 69% contributed by the use of efficient technology followed by mass transportation (15%), electricity costs (8%) and the rest almost the same between CNG and biofuels. This shows that the use of efficient technology is very influential on reducing fuel consumption. Therefore, the government needs to establish the standard for fuel consumption according to the type of vehicle.

The second biggest renewable power capacity is biomass, with 1.8 GW of installed capacity as of 2016, out of an estimated total potential of 50 GW. Most of the plants (94%) are not connected to the grid (PwC, 2017). Biomass utilisation outside the electricity sector is in the form of biodiesel, of which about 3.7 billion litres were produced in 2016. Indonesia ranks as the 4th leading biodiesel producer in the world (Statista, 2018), of which some 90% is produced from palm sludge oil (USDA, 2017). Biofuel production and domestic consumption are encouraged through the “biofuel mandatory programme”.

The use of biofuels started in 2006 with the issuance of Presidential Regulation No. 5/2006 concerning the target of biofuels in 2025 amounting to 5% of national energy mix. In 2015, the Government issued MEMR Regulation No. 12/2015 concerning biofuels mandatory as a replacement for the 2 (two) previous MEMR regulations. In the baseline, the use of biodiesel as a substitute for diesel oil has been considered in accordance with the target of biodiesel mixtures inj MEMR Regulation No. 12/2015, which is 20% for the 2016-2025 period and increases to 30% for 2026-2050.

This programme sets progressive biofuel blending targets for the period 2008-25, and forms part of the government’s policy to decrease reliance on petroleum-based fuels and reduce GHG emissions. MEMR regulation No.
32 defines the minimum percentage of biofuel to be mixed into fossil diesel in transportation, in industrial and commercial use, and for electricity generation. Since 2008, the blending mandate regulation has been revised several times, most recently through MEMR No.12 in 2015, raising biodiesel blending targets from 10% to 15% for transportation and industrial uses, and to 25% for electricity generation.

Oil fuels substitution case is a case of increasing penetration of biodiesel and BBG in land transportation. On baseline of diesel oil demand for land transportation in Indonesia (including Jabodetabek), the potential for biodiesel penetration as a substitute for diesel oil follows biofuels mandatory stated in MEMR Regulation 12/2015. In this regulation, biodiesel utilization in 2020 is 30% of biosolar (a mixture of diesel oil with biodiesel) and is considered constant until 2050. In the case of substitution of oil fuels with biodiesel, the biodiesel mix in biosolar is assumed to increase to 35% starting 2030. Increasing the use of B30 to B35 starting in 2030 will reduce diesel oil demand from 82 thousand kl in 2030 to 219 thousand kl in 2050.

Biodiesel will not be absorbed optimally if the price is higher than diesel oil. In addition, the current vehicle specifications in Indonesia are difficult to use B-20 because it will increase vehicle operating costs. However, increased use of biodiesel will reduce the import of diesel oil and saving the country's foreign exchange. For this reason, the Government needs to create formulas and policies that do not burden biodiesel users and automotive manufacturers.

Increase the use of biofuels based on palm oil. Palm oil productivity is higher compared to other raw materials also soil and climate conditions in Indonesia have proven to be suitable for oil palm plantations. Based on Palm Oil Analytics, Indonesia is the largest palm oil producers in 2016. Beside that, Indonesia also number one exportir in world with domination 56% of total production CPO in the world and 57% from total export to all nations in the world.

Spending on fossil fuel and electricity subsidies put pressure on the country’s fiscal capacity and, until recently, it was a major contributor to its fiscal deficit (IEA, 2016). Additionally, the burden of energy subsidies has made it difficult for the government to allocate its budget to long-term investments in essential public services – such as infrastructure, education, health, and social protection – that are beneficial for economic growth and development (Indonesian Administration, 2017).

Mainly as a result of high spending on energy subsidies, the Indonesian government’s expenditure on priority areas has been low, especially compared with other countries. Between 2000 and 2013, Indonesia spent an average of 3.6% of GDP per annum on public investments and public private partnerships in infrastructure, compared with 17.7% in China, 11.3% in Malaysia and 6.3% in Thailand. The shares of health and social assistance expenditure in GDP have also been significantly lower than both the average for Southeast Asian countries and the low and medium income countries averages. Low revenue collection is also a major cause of underspending on priority sectors (The World Bank, 2018).

From 2014 onwards, falling energy prices and substantial reforms adopted by the new government have allowed significant reduction in the energy subsidy bill. In one year, between 2014 and 2015, the government saved IDR 120 trillion (USD 9 billion) as fossilfuel subsidy outlays dropped from IDR 240 trillion (USD 20 billion) to IDR 60 trillion (USD 4.5 billion). The share of fossil fuels and electricity subsidies in total government expenditure fell by 12.5 percentage points, while their share in GDP decreased from 4% to 1.5%.

This important cut in energy subsidies enabled the government to reallocate spending towards productive sectors. In 2015, more than 60% of fossil-fuel subsidy savings were invested in infrastructure and rural and regional development projects. The rest was split among social welfare programmes (12%), health and education (2% and 5% respectively), and agricultural subsidies (14%). Savings have mainly been allocated through transfers to ministries, state-owned enterprises, and regions and villages. Overall, between 2014 and 2015, the share of health, education and infrastructure spending in total government expenditure increased by 0.7, 1.5, and 5.5 percentage points respectively.
3. Research Methodology

A Logarithmic Multiple Regression using Ordinary Least Squares (OLS) method was employed with crude oil price as the dependent variable and the other variables as independent variables. Least square approach was used to determine a line of best fit by minimising the sum of squares created by a mathematical function. A “square” is determined by squaring the distance between a data point and the regression line. The least square approach limits the distance between a function and the data points that a function is trying to explain (Ray, 2015).

Amarfio, E. M. et al. 2017 using OLS to analyze employed a log-log multiple regression with oil price as the response variable and the other factors mentioned as predictor variables. The results from the regression analysis were complemented with trend analysis of these factors with oil prices. It was revealed from the results that all explanatory variables examined save natural gas consumption and wars were found to have significant impact in the oil price determination.

A, Norhidayu. et al. 2017 using Least Square (LS) and robustness check to empirically test the CobbDouglas (C-D) production function for the palm oil production sector in Malaysia with the validity of C-D’s assumptions. The significance of factors such as capital, labour and utilisation rate in the production of Crude Palm Oil (CPO) is also tested in the study. The results show a positive and significant relationship between the production of CPO and labour, capital, and the utilisation rate.

The dependent variable is global crude palm oil price and denoted as PCPO. The independent variables were; global crude oil price that denoted as PCRUD OIL, Industrial production index that denoted as IPI, and dummy variable shows implementation of B20 policy.

Model specification:
Log regression model that applies; it is expressed mathematically as:
\[
\ln(P_{CPO}) = C + \beta_1\ln(P_{CRODE OIL}) + \beta_2\ln(IPI) + D1
\]

Hypotheses:
H1: all independent variables are significant influence dependent variables
H0: all independent variables are not significant influence dependent variables

4. Result and Discussion

The results of computation are presented in Table 1 below.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>T-Stat</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOIL</td>
<td>0.708691</td>
<td>14.78076</td>
<td>0.0000</td>
</tr>
<tr>
<td>LIPI</td>
<td>-0.845260</td>
<td>-4.91967</td>
<td>0.0000</td>
</tr>
<tr>
<td>D1</td>
<td>0.292539</td>
<td>6.66846</td>
<td>0.0000</td>
</tr>
<tr>
<td>C</td>
<td>7.463296</td>
<td>8.48580</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

| R-squared | 0.609916 | Mean dependent var | 6.469918 |
| Adj. R-squared | 0.603378 | S. D. Dependent var | 0.325042 |
| F-statistic | 93.29171 (0.0000) | | |
Based on model specification above, this model was selected because there is a correlation between crude palm oil price and crude oil price. The data used is monthly time series from 2004, January until 2019, March. The regression was developed as follows:

\[
\ln(P_{CPO}) = 7,463 + 0,708 \ln(P_{CRUDE OIL}) - 0,845 \ln(IPI) + 0,292D
\]

\(\ln(P_{CRUDE OIL})\) at 1% significance level, crude oil price confirmed as a significant determinant of crude palm oil price. With a coefficient of 0.708, it indicates that an increase in crude oil price by 1% will lead to an increase in crude palm oil price. This confirms with economic theory where an increase in the demand for a good drive its price upward (demand and prices are directly related). According to Möbert (2007), the upward trend of oil prices at the spot market are a result of increasing demand in emerging markets.

\(\ln(IPI)\) at 1% significance level, industrial production index confirmed as a significant determinant of crude palm oil price. With a coefficient of 0.845, it indicates that an increase in industrial production index by 1% will lead to a decrease in crude palm oil price. This variable is set as a control variable.

Dummy variable at 1% significance level, implementation B20 policy confirmed as a significant determinant of crude palm oil price. With a coefficient of 0.292, it indicates that implementing B20 policy will lead to an increase in crude palm oil price. B20 change all fossil fuels consumption into biodiesel because it's obligation based on MEMR Regulation 12/2015. Consumption will increase demand, as the theory for a good drive it prices upward (demand and prices are directly related).

Three independent variables are important to influence crude palm oil price. Crude oil price have positive and strong correlation to dependent variables because if crude oil price increase all people will look into crude palm oil and the demand will rise as price rise also. People will look crude oil and crude palm oil as substitution goods, when the nature of substitution goods is when demand other goods rise, it will increase substitution goods.

Examining the goodness of fit statistics, the null hypothesis of the F test is rejected at 1% significance level (p value of 0.000) proving the model generated is statistically significant. The results also indicated that about 60.3% of the variation in oil price is caused by the factors present in the regression equation. With a relatively low p value of 0.325042, this model provides a very good fit for the available data values. The average distance of observed logged oil price values from that generated by the fitted plot is approximately 0.325042. The p value of the normality test for residuals was 0.045** ≈ 0.005, ** at 95% confidence level as this approximation will have a negligible effect on the accuracy of the values generated. This regression model is thus appropriate in the analysis of the crude oil price determinants.

Conclusions

Four different factors were evaluated in this research using regression models. The evaluated factors were shown to behave in accordance with hypothesis of the research even though a single method proved some factors such as industrial production index to be significant but negative correlation. From the analysis, it can be proven that, all independent variables are significant to dependent variables. Crude oil price and policyB20 are significant with positive correlation, it means when both independent variables are increased, crude palm oil price will also increase, ceteris paribus. Industrial production index have negative correlation with dependent variables that mean if industrial production index increase, crude palm oil price will decrease. It shows that policy about B20 can save state budget that knows by coefficient of crude oil. The difference of number between coefficient and variable crude oil price state that state can save some money by using biodiesel if crude oil price increase.
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DO FOREIGN INVESTMENTS AND RENEWABLE ENERGY CONSUMPTION AFFECT THE AIR QUALITY? CASE STUDY OF ASEAN COUNTRIES

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Abstract. Decent quality of air plays an important role to support all creature’s life. This study examined the impact of foreign investment and the consumption of renewable energy supplies on the air quality in eight ASEAN countries over the period from 2005-2014. This research is a quantitative research that applies panel regression model. The selected random effect model shows, foreign investments affect the quality of air significantly as more investments will lead to more economic activities, thus increasing the consumptions of energy and the level of Carbon Dioxide (CO2) emissions. Further, the use of renewable energy will reduce CO2 emissions. The governments have to support the development of renewable energies and put smart policies to facilitate their development in the economy.

Keywords: air quality; foreign investment; renewable energy consumption


JEL Classifications: Q01, L25.

1. Introduction

Decent air quality plays a vital role in the survival of many creatures and is the right of every citizen to be able to feel it. However, air pollution is among the world’s most environmentally-related health risks of our time, killing about 6.5 million people worldwide each year (United Nations Environment, 2019). There have been many efforts aimed to socialize and reduce the impacts of air pollution, including The United Nations Environment Program which focuses on improving air quality to protect human health through many campaigns. The Global Initiative, led by the United Nations Environment Program, the World Health Organization and the Climate and Clean Air Coalition, aims to mobilize cities and individuals to protect our health and planet from the effects of air pollution. However, these efforts are not effective yet to reduce air contamination and improve air quality. It is evidenced by the increasing trend of Carbon Dioxide (CO2) Emission for the last 50 years, see figure 1.

During the process of economic development, the government has a huge need for funds to finance economic development projects. Depending on the state income originating from taxes, non-tax revenues, and grants will not be sufficient. While relying on the debt will have a long-term impact on the country, since the government is obliged to pay the loan interest and its principal at maturity. One of the alternatives is to attract foreign investment. Foreign investment is considered to develop new economic activities, create jobs, reduce unemployment and improve people’s welfare. The inflow of foreign capital is considered as an opportunity for local industries
to grow and expand their business scope or improve product quality and quantity. Foreign investments help technological transfers from foreign companies, without exploiting and giving certain pressure on local companies (Madura, 2010). Ideal foreign investment encourages more investment activities and ensures economic growth (Alfaro et al., 2004; Alguacil et al., 2011; Nor et al., 2015; Pengkas, 2015; Tvaronavičienė, 2019). However, more economic activities increase the needs of energy in addition to raw materials for production (Zamil et al., 2019; Lavrinenko et al., 2019; Vigliarolo, 2020; Chehabeddine, Tvaronavičienė, 2020). Concerning to the relationship of foreign investment of environment quality, there are several hypotheses that postulate the nexus of economic activities and environmental conditions including the Pollution Haven Hypothesis (PHH) and the Environmental Kuznets Curve (EKC). Both hypotheses argue that as higher economic activities will lead to higher pollution rate and degrade the environment conditions.

Figure 1. World Carbon Dioxide Emission (source: World Bank Database processed, 2019)

The Association of Southeast Asian Nations (ASEAN) is a regional intergovernmental organization comprising ten countries in Southeast Asia, which promotes intergovernmental cooperation and facilitates economic, political, security, military, educational, and sociocultural integration among its members and other countries in Asia. It is involved in numerous international affairs, and hosts diplomatic missions throughout the world. Alguacil et al. (2011) state that ASEAN region is one of the economic regions that have been enjoying for rapid economic developments for the last couple decades. These developments attract the inflow of foreign investments. In addition, the countries member of ASEAN are export-oriented countries that has a broad export destination. Pengkas (2015) argues, Industries in ASEAN countries are well-known as labour-intensive industries. Cheap labour and the abundant natural resources used as raw materials in this region were the motivations behind the inflow of many foreign direct investment. For multinational companies, cheap factors of production reduce the cost of production and become competitive advantages. The inflow of foreign investments ultimately triggered an increase in exports for many developing ASEAN countries.

This study aims to investigate the influence of foreign direct investment and the consumption of renewable energy on the CO2 emissions level. Governments and foreign investors are the parties who will take the most benefit of the study. Moreover, this study is projected to highlight the significant role of renewable energies supplies while providing guidance, insights or thoughts to assist in the establishment of policies concerning air pollution and degradation.

The remainder of this article is organized as follows. Part 2 provides a brief review of the related works of literature. Section 3 describes the data collected and the methodology. In section 4, results and analysis will be discussed while the last section brings research conclusions and provides recommendations for policy implications.
2. Literature Review

2.1. The impact of foreign investment on the CO2 emissions level

The relationship between foreign investment and its environmental impacts have been assessed in many empirical researches, especially for developing countries. The mainstream theory in this topic is what so-called The Pollution Haven Hypothesis (PHH). The theory stated that the impact of foreign investments inflow to the environment are worse in countries with looser environmental regulations and lower regulatory quality (Baek & Choi, 2015). Another mainstream theory concerning the flow of foreign investments and environmental degradation is the Environmental Kuznets Curve (EKC) Hypothesis that states the connection between economic growth and environmental degradation level. This hypothesis postulates that the environmental deprivation level rises as a country develops but fall when a certain level of income is reached. This hypothesis, which predicts that economic growth, is a solution to environmental problems in the future with no policy intervention (Abdouli & Hammami, 2014).

The study of (Baek & Choi, 2015), using panel data of 17 Latin American countries found a negative relationship between the inflow of foreign investments and air quality. Using the full sample of income level that includes the high, middle and low level income, Foreign Direct Investment increases the level of CO2 emissions and confirmed the Pollution Haven Hypothesis. However, using a single sample of income level, the impact of FDI is shown only in the sample of countries with higher level of income. This study also confirmed the increase of CO2 emission in countries with a higher energy consumption.

A study conducted by (Neequaye & Oladi, 2015) examined the nexus between the inflow of FDI and environmental degradation and found the existence of an Environmental Kuznets Curve (EKC) for carbon dioxide and total greenhouse gas emissions derived from foreign investments in energy and industrial sectors. This result is supported by the researches of (Hitam & Borhan, 2012; Ren et al., 2014; Sbia et al., 2014) but not (Pazienza, 2015). Hitam & Borhan (2012) found the existence of an EKC and confirmed that foreign direct investment increases environmental degradation. In Addition, Ren et al. (2014) confirmed the larger inflows of foreign investments will further aggravate China’s CO2 emissions level. Similarly, Sbia et al. (2014) confirmed the long run co-integration nexus between FDI and CO2 emissions level in the case of UAE as a sample country covering the period of 1975Q1–2011Q4. On the other hand, Pazienza (2015) studied how FDI inflowing the “agriculture and fishing” sector of 30 OECD countries exerts on CO2 emissions level over the period of 25 years. The findings confirmed the existence of the negative effects of FDI on CO2 emissions level. Further, using the VAR panel data model from 17 MENA countries over the period 1990–2012, Abdouli & Hammami (2017) confirmed the bidirectional causal relationship between CO2 emissions and economic growth, besides a bidirectional causality between foreign investments and CO2 emissions. As several studies found that contribute to the increased level of CO2 emission, we posit that:

**Hypothesis 1:** Higher foreign direct investments will provide the industry with fresh capital and new technology, thus increasing economic activity. The increased economic activities will require more energy and raw materials, thus, augmented the CO2 emissions and degrade the air quality.

2.2. The impact of renewable energies on the CO2 emissions level

The study conducted by (Cheng et al., 2019) examined the effects of renewable energy, environmental patents, and economic growth and foreign investments on the CO2 emission per capita from 2000 to 2013 for the BRICS countries. The findings show that renewable energy supply reduces the level of CO2 emission per capita with the strongest effect while the variable of Foreign Investment effects are varied at different conditional distributions.

A study of Chen et al. (2019) examined the impact of economic growth and the consumption of renewable and non-renewable energy on the carbon dioxide emission level in China over the period of 1995 and 2012. The em-
Practical findings state that the non-renewable energy consumption was found to have a positive and significant effect on carbon dioxide emission level, although this result diverse through the three regions of China, with the greatest impact being in the central region. The more non-renewable energy used will increase CO2 emissions. Further, the study confirmed that renewable energy consumption had a negative impact on the CO2 emissions level in the eastern and western regions of China. The following result is supported by a study of Nathaniel & Iheonu (2019) that found the non-renewable energy significantly increases CO2 emissions level.

Using a Panel VAR approach of 24 MENA countries over 35 years, (Adedoyin et al., 2020) examined the impact of renewable energy consumption and financial development on carbon dioxide (CO2) emissions and economic growth. The finding shows, financial development and renewable energy consumption have a little contribution in explaining the variation on the level of CO2 emissions and economic growth.

Research by Chen et al. (2019) found a long-run connection and co-integration among variables that include CO2 emissions, economic growth, renewable and non-renewable energy production and foreign trade in China. The study further confirmed the use of renewable energy as a solution to decrease the level of CO2 emissions since the increase of economic activity proxies by GDP and the use of non-renewable energy will increase the level of CO2 emissions, degrading the air quality in the country. The similar result is also found in (Kang et al., 2019) that confirmed the positive shock of GDP on the level of CO2 emissions.

A study of Waheed (2018) tested the long run and short run relationship between forest area, agricultural production, renewable energy, and CO2 emission. Applied ARDL model found the negative short run and the long run relationship between the forest area and the consumption of renewable energy on the CO2 emission level. The model show that forest planting act as a better solution to reduce air degradation, this comes due to the highest coefficient of variable forest area comparing to other variables under study. As several studies found that consumption of renewable energy supplies will reduce the level of CO2 emission, we posit that:

**Hypothesis 2**: higher consumption of renewable energy supplies will decrease the demand for non-renewable energies, thus decreasing the level of CO2 emissions and improve the air quality.

3. **Research Methodology**

This study is a quantitative research that applies Panel Data Regression Analysis with Random effect. The selection of Random Effect is based on the result of the Redundant Fixed Effect, Hausman, and Breusch-Pagan Random LM Tests. The application of this method is to examine the influence of determinant factors which include the foreign direct investments and the consumption of renewable energy on the CO2 Emission (kt). The study uses the sample of eight ASEAN countries comprising of Indonesia, Brunei Darussalam, Malaysia, Vietnam, Singapore, the Philippines Thailand, and Myanmar. This study uses secondary data in the form of a time series with annual frequency from 2005 to 2014. All data are derived from the World Bank. The selection of variables is based on previous literature studies. Based on the information above, the function of the model in this study is as follows where:

\[
CO2 \text{ Emissions} = f (\text{Foreign Direct Investment} + \text{Consumption of Renewable Energy} + e)
\]  

(1)

4. **Result and Discussion**

The random effect regression model shows that, foreign direct investment has positive and significant influence on the level of CO2 Emissions. Further, the use of renewable energies play a significant role in reducing the level of CO2 Emission. The model of Panel Regression and its analysis will be discussed as follows, table 1 displays Panel Regression Result:
Table 1. Panel Regression Result (Random Effect)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>LN_FDI</td>
<td>0.073707</td>
<td>0.028510</td>
<td>2.585310</td>
<td>0.0120</td>
</tr>
<tr>
<td>LN_RENEWABLE_ENERGY</td>
<td>-0.820292</td>
<td>0.328724</td>
<td>-2.495379</td>
<td>0.0152</td>
</tr>
<tr>
<td>C</td>
<td>11.74160</td>
<td>1.063608</td>
<td>11.03940</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

The positive coefficient of FDI conveys the message that higher inflow of foreign direct investment in ASEAN countries will lead to increased level of CO2 emissions. In other word, empirically, this proves the first hypothesis that postulates higher foreign direct investments will provide the industry with fresh capital and new technology, thus increasing economic activity. The increased economic activities will require more energy and raw materials, thus, augmented the CO2 emissions and degrade the air quality. This result is in line with study using a full sample of different income class conducted by (Baek & Choi, 2014), that found FDI surges the level of CO2 emissions. The result is also in line with (Neequaye & Oladi, 2015) that found increased carbon dioxide and total greenhouse gas emissions levels derived from foreign investments in energy and industrial sectors. It also support the studies of Bin Hitam and Binti Borhan (2012) and Sbia et al. (2014) that confirmed the larger inflows of foreign investments will further aggravate CO2 emissions level. On the other hand, the positive and significant effect of FDI on the dependent variable opposed the research of Pazienza (2015) that found a negative nexus between the FDI and air degradation. This come due to the nature of investment that focused on “agriculture and fishing” economic sectors. Planting and agricultural production will provide the environment with more fresh oxygen and reduce the emission of CO2.

The negative coefficient of renewable energies conveys the message that higher consumption of renewable energies will lead to decreased level of CO2 emissions. In other word, empirically, this proves the second hypothesis that postulates higher consumption on renewable energy supplies will decrease the demand for non-renewable energies, thus decreasing the level CO2 emissions and improve the air quality. The model in this study give the variable of renewable energy consumption highest coefficient which gives a clue that policies to support renewable energies development is a solution to solve the degradation of air quality. This result is in line with study of Cheng et al. (2009) that confirmed the use of renewable energy supply reduce the level of CO2 emission per capita with the strongest effect among other variables under study. This is also in line with research conducted by Chen et al. (2019) that confirmed higher renewable energy consumption had a negative impact on CO2 emissions level in the eastern and western regions of China. The significant and negative effect is also found in study of Waheed et al. (2018) that found the negative short run and long run relationship between the forest area and the consumption of renewable energy on the CO2 emission level. However, in this study, planting in more forest areas is believed to be better solution than increasing the use of renewable energies. On the other hand, the significant and negative effects of renewable energy consumption to explain the variation in the dependent variable oppose the study of Charfeddine and Kahia (2019) that found renewable energy consumptions to have little contribution in explaining the variation on the level of CO2 emissions.

5. Conclusions

Foreign investment helps developed countries by providing funds and technology for economic development. However, there are higher costs that should have been put into consideration as foreign investments contribute to the degradation of the air quality. This study examined the impact of foreign investment and the consumption of renewable energy supplies on the level of air quality. The empirical results highlighted the importance of the use of renewables energies to reduce the level of CO2 emissions. In addition, the findings show that foreign investments contributed to the increased level of CO2 emissions. Therefore, to recommend, the government bodies especially the ministry of Environment and Forestry and other government bodies need to support the development of renewable energy. Reforestation and planting more trees could also be solutions to improve air quality. Further studies can focus on many other variables that could affect the level of CO2 emissions such as the number of vehicles, deforestation rate/forest area, economic activities, and numbers of industry in the economy.
References


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Abstract. The paper highlights theoretical and practical approaches to the development of a sustainable type of tourism in the region. The concept of “sustainable tourism development” has been clarified, the relationship between its components on the basis of the author’s approach has been identified, which allows finding its most promising segment – international cruise tourism. The paper also discusses the optimization model for the development of international tourism in a region. Among the main segments that influence the development of cruise tourism in the region, sea, river and expeditionary cruises are considered. The profitability of the segments that affect the sustainable development of international cruise tourism in the region has been calculated.

Keywords: sustainable development; sustainable tourism; region; optimization model; international cruise tourism; profitability


JEL Classifications: Q01, R10, Z30, Z32, Z39.

Additional disciplines mathematics.

1. Introduction

Sustainable development of any region depends on development patters of its sectors of economy. Globalization of processes are closely related to expansion of tourism. There is a lot of attention to various facts of that sector in the recent scientific literature (e.g. Shevyakova et al., 2019; Singgalen et al., 2019; Zhylankozova, 2018; Chkalova et al., 2019 etc.). Concepts aimed at the possibility of the transition of the tourism sector and its subsectors to the path of sustainable development are becoming increasingly attractive. This is especially true for those countries where the development of tourism is based on the opportunity of creating long-term conditions and factors associated with the preservation of the natural resource potential, national, historical and cultural values of the country. This provision is in full accordance with the world trends of globalization in the field of tourism, the most important postulate of which is the preservation of natural systems, which in turn forms the conditions and directions for sustainable development.

Sustainable development of tourism has a multifaceted and ambiguous nature, based on planning and manage-
ment, making it possible to protect the natural environment and cultural heritage and ensure economic benefits (Korableva et al., 2018; Yang, Černevičiūtė, 2017). As for the sustainable development of international tourism, and, in particular, tourism, integrated in a number of countries related by a commonality of interests in cross-border cooperation, due to cardinal differences in the tourism policy of the regions, it becomes necessary to take into account individual factors of influence that have a rather complex structure.

2. Theoretical background

At the end of the 1990s, the World Tourism Organization adopted the most important document entitled Agenda 21 for the Travel and Tourism Industry. It analyzes the effects of uncontrolled tourism growth aimed at quick profit, which has negative consequences in connection with damage to the environment and local communities and to the emergence of many other socio-economic problems. The document also noted that the tourism and travel sector had the potential needed to improve both environmental and socio-economic problems in those countries where there were tourism and appropriate culture (Pavlyshyn et al., 2019; Tarman, 2016; Fedulova et al., 2019). Moreover, the culture of intensive consumption must be reoriented to a culture of growth, leading to a balance of economic and environmental development parameters, intelligently distributing the benefits received (Kolupaev et al, 2018; Glotko et al., 2019; Voronkova et al., 2019; Prodanova et al., 2017).

In Agenda 21 for the Travel and Tourism Industry, the sustainable development of tourism is linked to meeting the current needs of tourists in the host regions while enhancing future opportunities (Rosland, 2001). Among the latest global trends in tourism development, a special place is occupied by the concept of sustainable tourism development. The need for the transition of the tourism sector to the principles of sustainable development in the modern conditions of globalization and informatization of society is obvious. Practice shows that the uncontrolled growth of tourism, which aims to quickly make a profit, often has negative consequences, since it damages the environment, the local community and destroys the very foundation on which the functioning and successful development of tourism rests (Vasilchenko, 2018; Kashirskaya et al., 2019; Dunets et al., 2019a,b).

The debate around the world about the concept of sustainable tourism development became a phenomenon of the 1990s. However, undoubtedly, the concept of sustainable development of tourism originates from the concept of sustainable development in general. The concept of sustainable development is multifaceted, multidimensional and ambiguous. Sustainable usually refers to development that satisfies the present needs without compromising the ability of future generations to meet their own needs (Ivanova et al., 2019). Thus, sustainable development takes into account longer-term prospects than a person usually does when making decisions and implies the need for management and planning (Goryushkina et al., 2019; Chernysheva et al., 2019; Akhmetshin et al., 2019).

3. Methodology

In order to identify how effective and sustainable each of the cruise tourism destinations for each of the countries of the Caspian region is, it is necessary to use the principles and conditions of optimization modeling, reflecting the relationship between generic (indicators of socio-economic development) and explicit variables (criteria). The construction of the optimization model was based on the statistical base of the Association of Sea Trade Ports (www.morport.com).

4. Results and discussion

Monitoring sustainable development of tourism should be comprehensive, since its subsystems are multifaceted, include a whole range of conditions and factors of economic, social and environmental nature, taking into account the political orientation. This approach to the study of tourism sustainability allowed the author to formulate the following classification, in which the political component that takes into account the interests of each country, i.e., cross-border cooperation of states belonging to a specific region, acts as a clarifying position for sustainable tourism (Fig. 1).
Here are the definitions of sustainable development of tourism in the region in terms of the sustainability of each of its components (Porohin, 2015; Urban, 2015; Prodanova et al., 2019; Prokhorova et al., 2016):

- economic sustainability is directly related to the presence for each country of economic benefits from the tourism sector, the ability to cover costs associated with real tourist flows, as well as providing real income to the local population of a host territory;
- socially sustainable tourism implies the ability of a country of a studied region to accept real and potential incoming flows of tourists, while avoiding the appearance of social disharmony;
- ecologically sustainable tourism has a stable natural resource base compatible with the load, the throughput potential of the ecosystem and its biodiversity (Korchevenkov and Aleksandrova, 2018);
- political stability implies stability in the development of international relations and cross-border cooperation, which are characterized by the International Council on the development of tourism in the region coordinated by the participants.

The formulation of tourism development programs in the region involves an economic assessment based on quantitative and qualitative parameters (criteria, indicators, indices) of its functioning. A similar assessment can be made based on the use of a set of models, and in particular optimization modeling, which makes it possible to choose the optimal method and direction of development with maximum results. In the most general form, the model for the implementation of sustainable tourism is depicted in Fig. 2.

Sustainable tourism development in the region implies economic, environmental, social and political sustainability. Each of the areas of sustainability has its own indicators that determine the development of tourism in each country in the region, and indicators that characterize the development of tourism activities of a local nature, being individual for each particular country.
Sustainable forms of tourism are currently very diverse, it is only needed to maintain high levels of attractiveness for tourists in service, consistent with the international standards (Porokhin and Urban, 2015; Luzina et al., 2019).

To date, the Caspian region is one of the most important geopolitical centers, noticeable not only in political and business activity in the world but also in providing a high level of tourist attractiveness for its territories (Avanesyan, 2012). It should be noted that according to expert estimates of CNN Travel, another attractive region will soon appear on the world tourist map, which until recently remained inaccessible to traveling. After Russia, Azerbaijan, Kazakhstan, Turkmenistan, and Iran have agreed on the international status of the Caspian Sea, it will open up for mass tourism. In the early 1990s, the Caspian Sea was at the center of intense international negotiations. Five states shared the Caspian coastline: Russia in the west and northwest, Kazakhstan in the north, northeast, and east, Iran in the south, Azerbaijan in the southwest, Turkmenistan in the southeast. In 1996, the Caspian littoral states created a special working group, which was supposed to develop the Convention on the legal status of the Caspian Sea. After 27 years of negotiations, the states were able to come to a consensus and on August 12, 2018 in Aktau (Kazakhstan) they signed the Convention on the legal status of the Caspian Sea. On June 8, 2019, as part of the St. Petersburg International Economic Forum, a round table was held on “Russia in the Caspian Region. Prospects for the Development of International Trade”. At the round table, among others, the topic of the development of cruise tourism on the Lower Volga and the Caspian Sea was discussed. Speaking at the meeting, the Minister of the Russian Federation for North Caucasus Affairs Sergey Chebotarev announced the construction of cruise terminals in Astrakhan and Derbent. The Moscow River Shipping Company, the largest owner of passenger tourist ships in Russia, is already preparing to master new routes: on May 24, 2019 at the Lotos shipyard in Astrakhan, the newest “Peter the Great” cruise ship of PV300VD project was launched, which will be able to make in the future two-week cruises along the Caspian Sea with call at the ports of Azerbaijan, Russia, Kazakhstan, Turkmenistan, and Iran.

So far, according to the published information, the new river-sea cruise ship is planned to be used on the inland waterways of the European part of the Russian Federation, in the Black and Azov Seas. The likely routes that the liner will serve are Moscow – St. Petersburg, Moscow – Sochi, Novorossiysk, and others. In the future, “Peter the Great” may enter the Moscow – Baku route. According to expert estimates, the demand for cruises in the Caspian Sea will be great, since there have been no cruises in this region yet. It is assumed that in the coming years all tickets will be sold out. As soon as the construction of “Peter the Great” liner is completed, the shipping company will immediately be ready to start cruises. Perhaps it will be already June 2020. It is also assumed that the liner will go along the route Baku – Sochi and Baku – Moscow and back. Moreover, according to the head of the shipping company, by the beginning of cruises in the Caspian Sea, border and customs formalities must be settled.

It is necessary, at least in Astrakhan, to introduce the procedure for passenger clearance, approximately the same as when clearing cargo ships, when the commission arrives onboard, checks the crew and then the ship
can sail towards the border into the Caspian Sea (Kashirskaya et al. 2019). In addition, there are some difficulties with the port infrastructure in Makhachkala and Derbent, which today are not suitable for receiving cruise tourist ships. Therefore, it is planned to start cruise service without the Republic of Dagestan so far, departing from Astrakhan immediately to Kazakhstan. To attract foreign tourists, it is proposed to simplify visa procedures. The 2018 FIFA World Cup showed that with the facilitation in obtaining a visa, the number of people wishing to come to Russia is increasing. The same methods can be used, offering cruises to foreign guests. Accordingly, the Caspian region is a landmark in the development of cruise tourism.

The potential of the Caspian region is capable of giving a powerful impetus to the development of cruise tourism not only in the Caspian Sea but also throughout the Volga basin. This is an international route that will attract the Caspian states to the exchange of tourist flows. As far as it is known, the Caspian region includes the waters of the Caspian Sea and the coastal territories of Russia, Iran, Kazakhstan, Azerbaijan, and Turkmenistan. The Caspian region is still a territory of internal instability with a set of intricate ethnic, religious, territorial disputes and aggravation of interethnic conflicts, which, of course, leaves its mark on the development of the tourism sector. Nevertheless, sandy beaches, mineral springs with healing water and mud from coastal areas, which provide opportunities for active rest, treatment and recreation, are very attractive for tourists in terms of international travel. In the Caspian region, such types of tourism as cultural-cognitive (guided tours), beach, medical, recreational, ethnographic, mountain tourism, mountaineering, and, of course, cruises will make the most possible use of tourism resources and further strengthen the relationship between the Caspian Five countries. However, the development of the hospitality and leisure industry in general on the Caspian coast is quite behind the Black Sea coast. This is largely explained by the positioning of the Caspian Sea as a source of hydrocarbon production with the appropriate infrastructure. Nevertheless, significant progress has been made in the development of tourism in a number of countries in the Caspian region. In some countries, resort and recreation zones begin to develop, tourist infrastructure is being created, processes are underway to inform the population about the country’s tourism opportunities, cruise liners are being built (Avanesyan, 2012). In Azerbaijan in the 1990s, a significant outflow of holidaymakers was observed. At present, tourism is beginning to develop rapidly and gain momentum. The progressive development of the tourism sector in this country of the Caspian region is largely facilitated by the unique nature and specificity of local attractions: mosques, temples, ancient settlements. Azerbaijan is proud of its world-class resort in Amburan, which already today has high tourist attractiveness in terms of pricing and quality of guest services. The construction of a modern tourist complex in the village of Nardaran, which will have not only upscale buildings but also modern comfortable cottages, has begun. The Sea Breeze resort is generally compatible with the famous hotels in Miami. Countries such as Russia, Kazakhstan, and Turkmenistan are also making a significant impact on the sustainable development of tourism in this region, launching a large number of investment projects in this area, including resort areas, tourist complexes, construction of cruise ships, etc. Next, let us consider the regions of the Caspian region that are part of the Russian Federation: Astrakhan Region, Republic of Kalmykia and Republic of Dagestan. The Astrakhan Region is distinguished by its favorable geographical position, significant economic, resource, recreational, scientific, technical, and infrastructural potential. The economic and geographical position of the Astrakhan Region is characterized by the fact that it occupies the southern part of the East European Plain in the territory of the Caspian Lowland, the Volga-Akhtuba floodplain and the Volga delta, which allows developing a variety of types of tourism within its area (Arutyunyan and Soloviev, 2019:). The Volga River crosses the Astrakhan Region, giving great opportunities for the development of cruise tourism in the region (Sorokin D.E., and all, 2017). Cruises are dispatched from moorings in the Golden Zaton. Astrakhan river cruise tourism has great development prospects. At the present stage of its development, one can state the fact that the potential of cruise tourism is significantly underutilized. The Astrakhan Region has a convenient geographical position – any delta site is already advantageous as it has both river and sea communication. In addition, it is obvious that any cruise is access to completely different foreign markets. The tourist and recreational potential of the territory, natural, cultural, historical, and socio-economic factors determine the spatial characteristics of tourism. The biological resources of the region are also of great economic importance.

Ecological, educational and scientific tourism is provided by a wide variety of rare and relict species of fauna and flora, and by the presence of numerous archaeological and historical landmarks. It is known that cultural
heritage increases the tourist potential of the region. The restoration of monuments of architecture and urban planning allowed expanding guided tourism in the historical part of the city of Astrakhan. A separate area of guided tourism is children’s cultural tourism (Adelman and Bunakov, 2016). Event tourism is associated with visiting iconic cultural, historical, social, professional, archaeological events: a gastronomic festival of national cuisine, an art festival, fisherman’s day, reconstruction of a historic city, etc. can be considered an innovative form of tourism in the Astrakhan Region. Water cruises along the Volga and the Caspian Sea provide diversification of the tourist product of the Astrakhan Region. The Republic of Kalmykia has tremendous tourism potential that needs to be developed. The historical, cultural and natural heritage of the Kalmyk people, ancient national traditions, folk crafts – all this contributes to the development of almost all types of tourism – sightseeing, business, educational, medical (folk medicine), environmental, youth, cultural, educational, religious and educational, as well as hunting and fishing. Today, the unlimited opportunities of the unique nature of the Republic of Kalmykia are used for tourism purposes only on a very modest scale.

Possessing a variety of flora and fauna, convenient location, numerous ancient mounds, having favorable tourist opportunities, Kalmykia has not yet been represented in the market of tourist services.

In general, the development of tourism in the Republic of Kalmykia is constrained by the following factors:
- general socio-economic instability, leading to an abrupt fall in demand, a sharp polarization of supply and demand to the detriment of the range and quality of services, the degradation of all forms of social tourism;
- lack of necessary funding for the implementation of tourism development programs in the Republic of Kalmykia;
- lack of an information-analytical system and mechanisms for collecting regular statistics in tourism and, as a result, the absence of serious analytical market research and marketing programs for the development of tourism in the Republic;
- inconsistency of the tourism infrastructure with world and European standards in all respects, primarily in terms of the quality and safety of the services provided;
- insufficiently developed tourism infrastructure in the area of the Republic;
- lack of a unified advertising policy among the subjects of tourism activities to create the image of the region, insufficient advertising of the national (republican) tourist product.

In the Republic of Dagestan, tourism activity began to develop over the past 2-3 years. Cultural resources belong to a high category (Derbent) but are almost unknown in the world. Nevertheless, the Republic of Dagestan has a high potential for the development of the tourist and recreational complex. Using unique climatic and historical-cultural opportunities, a powerful complex of tourist and recreational facilities can be created in the Republic. According to experts, the industry potential (recreational capacity) is more than 2 million tourists a year. In the future, until 2025, it is planned to develop the Sulak and Makhachkala seaside, the Magaramkent section of the Derbent seaside and mountain territories (Akhtynsky, Tabasaransky, Gunibsky, Khunzakhsky, Laksky and other districts), which will allow organizing a variety of sports (Pisarevsky, 2012). The main barrier to the development of tourism in Dagestan is the negative image that is emerging due to the unsafe situation in the region. The close proximity of the Chechen Republic is a source of a constant influx of refugees into the region. As reported, the cities of Dagestan periodically suffer from terrorist acts. Other barriers to the development of tourism in Dagestan are similar to those in Astrakhan, which is located on the northern border: undeveloped transport and tourist infrastructure, low level of service that does not meet the international standards. The negative image of Dagestan is also affected by the lack of an effective marketing strategy in the region. First of all, it is necessary to overcome the barrier associated with the airport capacity, given that tourism should become an economic driver in the coming years. It is planned to make some investments in the region to develop tourism (for example, the development of Novokayakent (sea coast), but these planned investments are not enough to ensure the planned increase in the tourist flow. Cruise tourism in the Caspian region is one of the fast-growing segments of the international tourism market, which has great resource potential due to the presence of the Caspian water area linking these countries, the ever-increasing demand and high sustainability that can be achieved in this type of tourism. The increase in demand for cruise tourism is characterized by environmental components of sustainable
development, a balance of socio-economic interests while maintaining the principles of cross-border cooperation (Lomova et al., 2019; Almeida et al., 2019; Jafarpour et al., 2019; Aleksandrova et al., 2017; Nikolaeva et al., 2019; Maulana et al., 2019). In this regard, the initial model for the study of sustainable development of cruise tourism in the Caspian region can be represented as follows (Fig. 3). However, in order to organize cruise tourism in the Caspian Sea, it is necessary to solve a number of issues – the creation of a company or companies that will organize the whole process, the construction of special cruise liners, the creation of the necessary modern infrastructure, the construction of parking and marinas for yachts, the preparation of beaches, the formation of a single recognizable tourist package, as well as the training of specialists. (Karabsheva, 2018).

Figure 3. Sustainable development model of cruise tourism in the Caspian region

Source: authors’ research

There are many tasks, but they are all solvable. Their solution can open a whole new page in the development of tourism and open for tourists the Caspian Fairy-Tale. Despite the lack of a direct exit from the Caspian Sea to the world ocean and a short exit to other seas, tourists arriving in one of the Caspian countries could make a short tour of the Caspian Sea. There are also all the conditions for the development of international cruise tourism from the ports of the Caspian countries (Ovcharov, 2008; Paiano et al., 2020). Currently, there is a qualitative increase in international sea cruises in this region. By analogy with hotels, cruise ships are assigned appropriate stars depending on a number of certain criteria, such as: rigging and tourist infrastructure of the vessel, quality of passenger cabin conditions, level and quality of food onboard, availability of entertainment programs and a range of additional services onboard the liner, etc. For the development of international cruise tourism in the Caspian countries, there is currently an opportunity to use a system of channels that will enable cruise ships from the Mediterranean and Black Seas to go to the Caspian Sea and visit the Caspian countries during the navigation season. This will ensure a long, but fascinating journey, while covering more countries. In December 2017, a memorandum on cooperation with Russia in the field of international tourism was signed in the capital of Azerbaijan, Baku. The main emphasis is on the use of “Peter the Great” cruise ship. A set of cruise routes has already been developed, involving the ports of Astrakhan and almost all the ports of the Caspian countries. (Frolova et al., 2019).

Among the main segments that influence the development of cruise tourism in the Caspian region are the following:
1. Sea cruises (cruise liners, cruise ferries, cruise yachts);
2. River cruises;
3. Expedition cruises.

Cabins on sea cruise liners should vary in interior, range of services, and, accordingly, price category. Ferries, as a type of sea cruise ship, due to their economical category, will also be quite popular in international cruises,
as they are also multi-deck sea vessels (http://www.unep.fr). River cruises are those made within countries with access to the waters of the Caspian Sea.

Expedition cruises can be sea or river, the main purpose being to visit remote and inaccessible places in the countries of the Caspian region while maintaining an acceptable level of comfort and quality of tourist services.

Based on the foregoing, the initial research model (Fig. 2) should be presented as follows (Fig. 4):

![Figure 4. Development model of cruise tourism in the Caspian region](source)

In order to identify how effective and sustainable each of the cruise tourism destinations for each of the countries of the Caspian region is, it is necessary to use the principles and conditions of optimization modeling, reflecting the relationship between generic (indicators of socio-economic development) and explicit variables (criteria) (Kashirskaya et al., 2018).

Generic variables are displayed in the model as ovals, and explicit variables – as rectangles. According to the optimization modeling algorithm, the following formula can be applied:

\[ R_{ICT} = \alpha_0 + \alpha_1 R_{SC} + \alpha_2 R_{RC} + \alpha_3 R_{EC} + r \cdot d_{ICT} \]

where: \(R_{SC}, R_{RC}, R_{EC}\) – generic variables, \(\alpha_1, \alpha_2, \alpha_3\) – coefficients reflecting the strength and direction of relations between generic variables, \(\alpha_0\) – free term, \(r, d_{ICT}\) – random deviate.

Under these conditions, the development model of international cruise tourism of a sustainable type will have the following form:

\[
\begin{aligned}
Y_{P_{SC}} &= G_{0_{SC}} + G_{1_{SC}} R_{ICT} + r \cdot d_{p} \\
Y_{P_{RC}} &= G_{0_{RC}} + G_{1_{RC}} R_{ICT} + r \cdot d_{rc} \\
Y_{P_{EC}} &= G_{0_{EC}} + G_{1_{EC}} R_{ICT} + r \cdot d_{ec}
\end{aligned}
\]

where: \(Y_{P_{SC}}, Y_{P_{RC}}, Y_{P_{EC}}\) – explicit variables, \(G_{1_{SC}}, G_{1_{RC}}, G_{1_{EC}}\) – demand factors, \(G_{0_{SC}}, G_{0_{RC}}, G_{0_{EC}}\) – free terms, \(r, d_{sc}, r, d_{rc}, r, d_{ec}\) – random deviate.

The construction of the optimization model was based on the statistical base of the Association of Sea Trade Ports (www.morport.com), which is reflected in Table (Rassohina T.V., 2013; Seselkin A.I., 2013).
<table>
<thead>
<tr>
<th>Table 1. Internal consistency of cruise tourism segments reflected in the model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Segments</td>
</tr>
<tr>
<td>----------------------------</td>
</tr>
<tr>
<td>Sea cruises (SC)</td>
</tr>
<tr>
<td>River cruises (RC)</td>
</tr>
<tr>
<td>Expedition cruises (EC)</td>
</tr>
</tbody>
</table>

All three criteria for consistency meet the necessary conditions ($\alpha_{ct} > 0.7$, $\rho_{DGol} > 0.7$, $G_1 > 1$, $G_2 < 1$).

The obtained values confirm the fact about the correctness and applicability of this optimization model. Moreover, this model shows that sea cruises in the Caspian Sea are most optimal from the perspective the theory of sustainable tourism development, in relation to other segments of international cruise tourism (Kruzhalin V.I., and all, 2014). This is also confirmed by the performance of the main segments of international cruises in the Caspian region (Table 2).

<table>
<thead>
<tr>
<th>Table 2. Profitability of the activities in segments that influence the sustainable development of international cruise tourism in the Caspian region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seacruises</td>
</tr>
<tr>
<td>River cruises</td>
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<tr>
<td>Expedition cruises</td>
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</tbody>
</table>

Using the results, built on the average actual growth indices of socio-economic indicators for each country of the Caspian region, it becomes possible to focus on the development of international cruise tourism, taking into account the priority of its segments.

**Conclusions**

Thus, one can conclude that by developing sustainable tourism, the countries of the Caspian region are developing international cooperation based on the principles of common interests. At the same time, international cooperation acts as one of the types of political cooperation, which logically supplements the theory of sustainable development, since it is based not only on socio-economic and political parameters but also assumes the equality of the parties, the responsibility of partners in tourism services and in the development of tourism in general. The article explored approaches to the development of sustainable tourism in the region. A model for the development of international tourism in the Caspian region is proposed. Among the main segments that influence the development of cruise tourism in the region are marked sea cruises, river and expeditionary.

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ASSESSMENT OF CRITERIA FOR PERFORMANCE EXCELLENCE (KPKU) AND FIRM PERFORMANCE: EVIDENCE FROM INDONESIA

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Abstract. This study aims to examine whether the assessment of Criteria for Performance Excellence (KPKU) is related to the firm performance of States-Owned Enterprise (SOE) in Indonesia. This study uses 82 firms-year observations from 19 State-Owned Enterprise listed on the Indonesia Stock Exchange (IDX) for the period 2009 to 2018. This study found that KPKU assessment was positively related to firm performance. This shows that KPKU assessment can be a signal that the company has good performance. The study also found that the positive relationship between KPKU assessment and company performance is stronger in companies audited by Big 4 and in big-sized companies. This study is the first research that discusses the relationship between KPKU assessment and firm performance. This study may be useful for practitioners and academics that are interested in the subject of SOE performance assessment. The results suggest to conduct a regular KPKU assessment because it can be useful to provide a positive signal for shareholders and potential investors.

Keywords: KPKU assessment; firm size; firm performance; states owned company


JEL Classifications: L25, G30, M10.

1. Introduction

The purpose of the establishment of the company is to improve firm performance in the long run. In practice, there are many decisions made in a company that are based on evaluating firm performance, so performance appraisal is one of the important elements that needs to be considered (Longenecker & Fink, 1999; Davis, 2002; Cintrón & Flaniken, 2011). Performance appraisal is considered as a key component in organizational success (Grote, 2002; Rasch, 2004). Performance appraisal allows companies to communicate to all internal parties about their level of growth, competence, and potential, thus enabling the improvement and development of the company. If used properly, performance appraisal can be a tool for organizations in organizing and coordinating the strengths of each of their employees to achieve the company’s strategic goals (Grote, 2002; Lewis, 1996; Narkuniene, Ulbinaite, 2018; Girdzijauskaite et al., 2019; Hilkevics, Semakina, 2019; El Idrissi et al., 2020; Caurkubule et al., 2020).

Performance appraisal is important for companies in identifying the strengths and opportunities that companies have in order to increase their competitive advantage (Arijanto et al., 2016). One of the methods used to assess and improve overall company performance continuously is use the Malcolm Baldrige Criteria for Performance
Excellence (MBCfPE). Assessments based on MBCfPE can be used to identify and evaluate work units for both profit-oriented and non-profit companies (Mayani et al., 2015). Criteria in MBCfPE can help the company assess performance on a variety of key business indicators: customers, products and services, finance, human resources, and operations (Ford & Evans, 2000; Roland, 2011). There are seven categories which are the criteria of Malcolm Baldrige (Arijanto et al., 2016), such as leadership, strategic planning, customer focus, measurement, analysis, and knowledge management, workforce focus, operations focus, and results.

In Indonesia, the MBCfPE criteria is used in assessing the Indonesia Quality Award. This is done with the aim of increasing awareness of companies in Indonesia that performance excellence is an important element for companies to compete and is a means of sharing information about success in implementing performance strategies and the benefits of using this strategy (Arijanto et al., 2016). On the other hand, the Ministry of State-Owned Enterprises uses an evaluation criterion called the Superior Performance Assessment Criteria (KPKU) in assessing the performance of SOEs. These assessment criteria are the result of the adoption of the MBCfPE criterion that has been used extensively throughout the world (Cintrón & Flaniken, 2011). The Ministry of State-Owned Enterprises develops the KPKU as a guide to develop, manage and empower SOE systems and resources to achieve superior SOE company performance. The KPKU is also used as a tool for conducting SOE self-assessments and providing feedback to each SOE strategies (Hardian et al., 2015; Arijanto et al., 2016; Wen et al., 2017). KPKU is mandatory to be practiced in the SOE environment, but until now there are SOEs that have not revealed their performance assessment scores or their KPKU score in the company’s annual report. Nowadays, KPKU is only applied to state-owned enterprise. This is regulated in Minister of State-Owned Enterprises Regulation No. PER-01/MBU/2011, Article 44 Chapter XII and letter from the Ministry of SOEs No. S-281/S.MBU/2014 concerning Implementation of Superior Criteria Performance Evaluation (KPKU) on 2014.

Performance appraisal is a widely discussed concept because it is a need to achieve organizational goals (Chen & Eldridge, 2012; Tippe, 2013). Many previous studies have discussed performance appraisal based on MBCfPE criteria, but there has been no specific research that discusses performance evaluation criteria through KPKU. Chen and Eldridge (2010) and Appelbaum et al. (2011) explain that performance appraisal can be used as a tool to increase motivation. In addition, van Emmerik et al. (2012) argue that performance appraisal can be used to motivate employees through rewards such as promotions and salary increases. Awards received by these employees can ultimately be used to improve company performance (Bassett-Jones & Lloyd, 2005). Aguinis and Pierce (2008) also explain that performance appraisal can be a starting point for improving individual performance in a way that is consistent with strategic objectives and with the ultimate goal of improving firm performance. However, on the other hand performance appraisal also has serious consequences in terms of employee dissatisfaction which can result in decreased productivity and organizational commitment (Maley, 2013).

There is no one has examined the relationship between the results of the KPKU assessment with the firm outcomes, which are reflected through the firm performance. Thus, this study was conducted to examine the relationship between the assessment of Criteria for Performance Excellence (KPKU) and the firm performance of States-Owned Enterprise (SOE) in Indonesia for the period 2009-2018. Using a sample of 82 firm-year observations, this study found that the relationship between KPKU assessment with firm performance was positive and significant. This indicates that the KPKU assessment can improve company performance by increasing communication and integration, framing organizational goals, and providing feedback on organizational strategies. This result can also be a positive signal for shareholders and investors that the company has good performance. In addition, this study also found that a positive relationship between KPKU assessment and company performance was stronger in companies audited by Big 4 and in big-sized companies.

This research makes a number of contributions. This study is the first research that examines the relationship between KPKU assessment with the firm performance of BUMN companies listed on the Indonesia Stock Exchange. This research can clarify our understanding of how performance is valued and provide useful suggestions for improving performance appraisal in organizations. In addition, this study also shows the importance
of KPKU assessment in encouraging SOEs performance. KPKU assessment can be a tool for comprehensive evaluation or assessment of company performance and can be a guideline or reference in the development and implementation of company systems so as to achieve strong growth rates which in turn can become a competitive advantage of the company. Furthermore, the results of this study can be used as a guideline for carrying out the company’s long-term and short-term strategies, using the KPKU as an evaluation tool for reliable and superior management practices. The results of this study suggest to conduct regular KPKU assessments because they can be useful to provide positive signals for shareholders and investors.

The remainder of this paper is organized as follows. The next section outlines the relevant research and develops the hypotheses. Section 3 details the sample, variables and empirical models. Section 4 provides the empirical analysis and results. Section 5 outlines the conclusions and implications of the study.

2. Literature Review

2.1. Assessment of Criteria for Performance Excellence (KPKU)

The Criteria for Performance Excellence (KPKU) is a basis for evaluation used by SOEs in providing feedback to SOEs to create high-quality performance (Wibowo, 2019). According to the Forum Ekselen BUMN (2014), KPKU is one of the Ministry of States-Owned Enterprise’s initiative strategies in creating systematic and sustainable improvements and performance improvements to encourage SOEs to improve performance to compete at the world level. The advantage of KPKU is its ability to provide comprehensive and integrated assessments. KPKU is an adaptation of the Malcolm Baldrige Criteria for Performance Excellence (MBCfPE).

KPKU is designed to encourage and help SOEs achieve the vision, mission and goals of the company, improve performance in a sustainable manner, and encourage the creation of a competitive advantage through the alignment of company plans, processes carried out, decision making, employee/labor focus and all actions which can ultimately be demonstrated by the achievement of superior results (Holzer et al., 2011; Mawirda & Yulihan, 2019). KPKU is also designed to be used as a holistic assessment tool to measure the company’s position and show what is needed by the company in the future to improve performance in the long run (Arijanto et al., 2016). The KPKU framework is divided into seven criteria, where each criterion is interconnected to create superior performance (Morrey, 2004; Wibowo, 2019), namely leadership, strategic planning, customer focus, measurement, analysis and knowledge management, workforce focus, focus on operations and results. The KPKU criteria are designed so that the company focuses on results related to the company’s excellence in its industry, such as the main performance of products or services and processes, customer performance, financial performance, human resource performance and organizational governance effectiveness.

Nowadays, the Ministry of SOEs is encouraging the creation of three core values in SOEs, namely integrity, strong national leadership and global mindset, therefore KPKU has been established as a criterion for measuring the level of SOE excellence (Ministry of BUMN RI, 2015). The application of KPKU-based assessments in SOEs is regulated in Minister of State-Owned Enterprises Regulation No. PER-01/MBU/2011, Article 44 Chapter XII and letters from the Ministry of SOEs No. S-281/S.MBU/2014 concerning Implementation of Performance Evaluation of Superior Criteria (KPKU) in 2014. The KPKU criteria are non-prescriptive and adaptive, that is, its application does not require companies to “ought” to have certain organizational structures such as Planning Units, Ethics Management Units, Quality Management Units or other independent functions and also does not require companies must implement ISO, Lean, Six Sigma, or Balanced Score Cards (Wibowo, 2019). This is because different companies have different conditions, sizes, and challenges. Forum Ekselel BUMN (2014) explained that KPKU has eight levels to classify the excellence level of an organization, where each level has indicators of the range of achievement scores as follows early development (0-275), early result (276-375), early improvement (376-475), good performance (476-575), emerging industry leaders (576-675), industry leaders (676-775), benchmark leaders (775-875) and world leaders (876-1000).
2.2. KPKU Assessment and Firm Performance

Given the increasingly fierce of business competition, companies need to make improvements on aspects that are important and significant for the corporate sustainability. The company must have a performance that is superior to its business competitors. In the SOE environment, one of the evaluation criteria that can be used by companies to have excellent performance is to use the KPKU criteria. As such, KPKU functions as a guide to develop, regulate and empower SOE systems and resources to achieve superior performance.

Siegal (2000) explains that performance appraisal is a process or evaluation system for plans that have been carried out by companies in accordance with predetermined standards. This assessment was approved to improve the current firm performance. Some previous research conducted related to performance appraisal shows that performance appraisal is used to plan organizations to achieve the company’s vision and mission (Nelly, 2001; Dessler, 2003). This can be done by increasing communication and integration, framing organizational goals, providing feedback on strategy, because organizational performance is always in line with organizational strategy. Furthermore, Bouti (2012) explains that the Key Performance Indicator (KPI) is a quantitative measure used to improve organizational performance in achieving organizational targets. KPIs are also used to determine the object being measured, see trends and support decision making. Chen and Eldridge (2010) and Appelbaum et al., (2011) explain that performance appraisal can be used as a tool to increase motivation. Performance appraisal can be used to motivate employees through rewards such as promotions and salary increases, which can then encourage employees to be more committed in improving the firm performance (Bassett-Jones & Lloyd, 2005; van Emmerik et al., 2012). Aguinis and Pierce (2008) also explain that performance appraisal can be a starting point for improving individual performance in a way that is consistent with strategic objectives and with the ultimate goal of improving the firm performance.

To be superior, companies must know about the internal and external environment must be better than competitors’ knowledge about themselves and their external environment. KPKU is designed to be used as a holistic assessment tool to measure the company’s position and determine what companies need to evaluate in the future to improve performance in the long run (Wibowo, 2019; Mawirda & Yulihasri, 2019). Thus, the hypothesis in this study is as follows:

Hypothesis: KPKU assessment is positively related to company performance.

3. Research Methodology

3.1. Sample

The initial sample of this study consisted of all state-owned companies listed on the Indonesia Stock Exchange (IDX) for the period 2009-2018. Data sources used in this study include the company’s annual report and the ORBIS database. Data related to KPKU assessment and Big 4 variable data are obtained through the company’s annual report, while the company’s financial data are obtained through the ORBIS database. The two datasets are merged and the following sample selection criteria are applied. Any observations without complete data, such as not having the KPKU score and financial data, are excluded from the sample. After applying sample selection criteria, the final sample included 82 firm-year observations.

3.2. Variable Definitions

The main variable of interest in this study is the assessment of the Criteria for Performance Excellence (KPKU). This variable was measured using the KPKU score obtained by the company in the year of observation (Hardian et al., 2015; Arijanto et al., 2016). Furthermore, the dependent variable in this study is firm performance (FP). This variable is measured by return on assets (ROA) and return on equity (ROE). ROA is measured as net income divided by total assets, while ROE is net income divided by the book value of total equity.
To overcome the problem of endogeneity in the form of omitted variables, which do not include explanatory variables that might affect the results of the study, this study uses several control variables. Referring to previous research (Cintrón & Flaniken, 2011; Roland, 2011; Harymawan et al., 2019) the control variables used in this study include: firm leverage (LEVERAGE) as measured by dividing total debt by total assets, firm size (FIRMSIZE) as measured by the natural logarithm of total assets, firm age (FIRMAGE) as measured by natural logarithms of the number of years since the company was founded, and big4 auditor (BIG4) which is a dummy variable, where the value of 1 if the company is audited by Big 4 and a value of 0 if the company is not audited by Big 4. See the Table 1 for a summary of variable definitions.

### Table 1. Definition and Expected Signs of Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
<th>Source</th>
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<tbody>
<tr>
<td>ROA</td>
<td>Net income divided by total assets</td>
<td>ORBIS</td>
</tr>
<tr>
<td>ROE</td>
<td>Net income divided by book value of total equity</td>
<td>ORBIS</td>
</tr>
<tr>
<td>KPKU</td>
<td>KPKU score obtained by the company</td>
<td>Annual Report</td>
</tr>
<tr>
<td>LEVERAGE</td>
<td>Total debt divided by total assets</td>
<td>ORBIS</td>
</tr>
<tr>
<td>FIRMSIZE</td>
<td>Natural logarithm of total assets</td>
<td>ORBIS</td>
</tr>
<tr>
<td>FIRMAGE</td>
<td>Natural logarithm of the number of years since</td>
<td>ORBIS</td>
</tr>
<tr>
<td></td>
<td>the company was founded</td>
<td></td>
</tr>
<tr>
<td>BIG4</td>
<td>Dummy variable, 1 for the firm audited by big 4</td>
<td>Financial Report</td>
</tr>
<tr>
<td></td>
<td>and 0 for the unaudited company by big 4</td>
<td></td>
</tr>
</tbody>
</table>

### 3.3. Methodology

This study uses an OLS regression model with fixed year and industry effects, and clustered standard errors (Petersen, 2009). To test the first hypothesis in this study, the following regression model is used:

\[
FP_{it} = \beta_0 + \beta_1 KPKU_{it} + \beta_2 LEVERAGE_{it} + \beta_3 FIRMSIZE_{it} + \beta_4 FIRMAGE_{it} + \beta_5 BIG4_{it} + \beta_6 YEAR_{it} + \text{INDUSTRY}_{it} + \varepsilon_{it}
\]

### 4. Result and Discussion

#### 4.1. Descriptive Statistics and Univariate Comparisons

Table 2 contains the sample distribution by year of observation and industry sector. The sample of companies that were observed in this study were distributed in five industries, including mining; construction; manufacturing; transportation, communications, and utilities; and finance, insurance, and real estate. The highest number of firm-years of observations coming from Mining (28), furthermore are Transportation, Communications and Utilities and Manufacturing (22), and Mining (12). Of the total observations of 82 firm-year observations, in 2014 and 2015 there were 16 companies that revealed the results of the KPKU assessment. That year showed the highest number of observations compared to previous years. This was driven by a letter from the Ministry of SOEs No.S-281/S.MBU/2014 regarding the Implementation of the Criteria for Performance Excellence (KPKU).
Table 2. Sample Distribution

<table>
<thead>
<tr>
<th>Year</th>
<th>(SIC 1) Mining</th>
<th>(SIC 2) Construction</th>
<th>(SIC 3) Manufacturing</th>
<th>(SIC 4) Transportation, Communications and Utilities</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2010</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2011</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2012</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>2013</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>2014</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>2015</td>
<td>6</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>16</td>
</tr>
<tr>
<td>2016</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>2017</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>2018</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>11</td>
<td>12</td>
<td>22</td>
<td>82</td>
</tr>
</tbody>
</table>

Notes: This table shows the sample distribution of 82 companies listed on the IDX in 2009-2018.

Table 3 shows the descriptive statistics. The mean value for ROA is 40.7%, while the average value for ROE is 99.9%. The average value for KPKU is 537.77, which is included in the category of emerging industry leaders. The average company has a leverage of 5.86% and total assets of IDR 95,530,000,000. The average age of the company is 44.2. Companies audited by Big 4 auditors have an average value of 0.573.

Table 3. Descriptive Statistics

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>4.070</td>
<td>3.425</td>
<td>-11.890</td>
<td>22.800</td>
</tr>
<tr>
<td>ROE</td>
<td>9.999</td>
<td>11.920</td>
<td>-42.080</td>
<td>40.540</td>
</tr>
<tr>
<td>KPKU</td>
<td>537.771</td>
<td>560.750</td>
<td>250.300</td>
<td>897.000</td>
</tr>
<tr>
<td>LEVERAGE</td>
<td>0.586</td>
<td>0.587</td>
<td>0.084</td>
<td>0.925</td>
</tr>
<tr>
<td>FIRMSIZE</td>
<td>95,530,000,000</td>
<td>30,650,000,000</td>
<td>1,250,000,000</td>
<td>1,130,000,000,000</td>
</tr>
<tr>
<td>FIRMAGE</td>
<td>44,207</td>
<td>41,500</td>
<td>15,000</td>
<td>121,000</td>
</tr>
<tr>
<td>BIG4</td>
<td>0.573</td>
<td>1.000</td>
<td>0.000</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Notes: This table shows descriptive statistics for all the variables used in this study. The sample used in this study amounted to 82 companies listed on the IDX in 2009-2018.

Table 4 displays the Pearson correlations. The correlations between KPKU and the firm performance measures, ROA and ROE, are in the predicted direction, but insignificant. Other correlations between control variables are generally low and don’t raise any multicollinearity issues for our subsequent analysis. FIRMSIZE and BIG4 variables show a negative correlation with company performance, but not significant. Furthermore, LEVERAGE and FIRMAGE variables are negatively and significantly related to ROA.

Table 4. Pearson Correlation

<table>
<thead>
<tr>
<th></th>
<th>ROA</th>
<th>ROE</th>
<th>KPKU</th>
<th>LEVERAGE</th>
<th>FIRMSIZE</th>
<th>FIRMAGE</th>
<th>BIG4</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROE</td>
<td>0.843***</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KPKU</td>
<td>0.093</td>
<td>0.091</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.404)</td>
<td>(0.414)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEVERAGE</td>
<td>-0.424***</td>
<td>0.035</td>
<td>0.091</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: This table shows the sample distribution of 82 companies listed on the IDX in 2009-2018.
4.2. KPKU Assessment and Firm Performance

Table 5 shows the results of model 1. Regression results in both specifications, using ROA and ROE as a proxy of company performance show a significant positive relationship. The coefficient on the KPKU shows 0.017 (t=2.15) and 0.027 (t=1.82). These results indicate that KPKU is positively and significantly related to ROA at the 5% level, whereas for ROE, KPKU is positively and significantly related to the 10% level. The results of this study are consistent with the hypothesis proposed in this study and indicate that the higher the KPKU assessment score, the higher the firm performance. Furthermore, the regression results for control variables show that company performance tends to be lower in companies that have high leverage and are audited by Big 4.

KPKU assessment can be a motivation for companies to identify strengths and opportunities that can improve company performance. In addition, KPKU assessment results can guide companies in managing existing resources to help companies achieve the expected results (Nelly, 2001; Dessler, 2003). KPKU assessment can spur companies to further enhance their abilities in every area of the organization and encourage employees to grow and not stop to continue to learn from the successes and failures that occur. Firm performance can improve if KPKU assessments are used appropriately to improve communication and integration, frame organizational goals, and provide feedback on organizational strategy (Bassett-Jones & Lloyd, 2005; van Emmerik et al., 2012; Chen & Eldridge, 2010; Appelbaum et al., 2011). Thus, the KPKU assessment can be a quantitative measure used to improve SOE performance and achieve the expected targets.

Table 5. KPKU Assessment and Firm Performance

<table>
<thead>
<tr>
<th></th>
<th>ROA</th>
<th>ROE</th>
</tr>
</thead>
<tbody>
<tr>
<td>KPKU</td>
<td>0.017**</td>
<td>0.027*</td>
</tr>
<tr>
<td></td>
<td>(2.15)</td>
<td>(1.82)</td>
</tr>
<tr>
<td>LEVERAGE</td>
<td>-23.671***</td>
<td>-23.903**</td>
</tr>
<tr>
<td></td>
<td>(-5.78)</td>
<td>(-2.27)</td>
</tr>
<tr>
<td>FIRMSIZE</td>
<td>0.803</td>
<td>2.391</td>
</tr>
<tr>
<td></td>
<td>(1.21)</td>
<td>(1.50)</td>
</tr>
<tr>
<td>FIRMAGE</td>
<td>-0.257</td>
<td>-1.858</td>
</tr>
<tr>
<td></td>
<td>(-0.22)</td>
<td>(-0.61)</td>
</tr>
<tr>
<td>BIG4</td>
<td>-3.124*</td>
<td>-9.483**</td>
</tr>
<tr>
<td></td>
<td>(-1.80)</td>
<td>(-2.27)</td>
</tr>
<tr>
<td>CONSTANT</td>
<td>-10.888</td>
<td>-46.534</td>
</tr>
<tr>
<td></td>
<td>(-0.56)</td>
<td>(-1.11)</td>
</tr>
<tr>
<td>Year Dummies</td>
<td>Included</td>
<td>Included</td>
</tr>
<tr>
<td>Industry Dummies</td>
<td>Included</td>
<td>Included</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.501</td>
<td>0.377</td>
</tr>
<tr>
<td>N</td>
<td>82</td>
<td>82</td>
</tr>
</tbody>
</table>

Notes: This table shows the results of multiple linear regression between KPKU Assessment and firm performance of 82 companies listed on the IDX in 2009-2018 with ’t > 1.645, **’ t > 1.960, *** t > 2.326, significance at 10%, 5% and 1%.
4.3. Additional Analysis

This study also examines two specific situations where we expect to affect the relationship between the KPKU assessment and firm performance. The first situation is when the company is audited by Big 4 and non-Big 4 auditors, while the second situation is when the research observation is in a large-sized company compared to a small-sized company.

In the first additional analysis, regression was carried out by dividing the research sample into two groups, namely companies that were audited by Big 4 amount of 47 observations and companies audited by non-Big 4 as many as 35 observations. Table 6 shows the regression results for companies audited by Big 4 and non-Big 4. It can be seen that the KPKU coefficient in the Big 4 column is 0.020 (t=2.29) for ROA, and 0.035 (t=2.12) for ROE. Both the specifics of the companies audited by Big 4 indicate that the KPKU assessment is positively and significantly related to the 5% level. Meanwhile, the regression results for companies audited by non-Big 4 show a negative but not significant relationship to all firm performance proxies, ROA and ROE. This result reinforces some of the previous findings. These results indicate that KPKU assessment is positively related to the firm performance in companies audited by Big 4 auditors. This indicates that companies audited by Big 4 that tend to have good consequences and responsibility to maintain their reputation, the KPKU assessment is used as a guide to develop, regulate and empower company systems and resources to achieve the superior firm performance.

Table 6. KPKU Assessment in the Companies Audited by Big 4 vs Non-Big 4

<table>
<thead>
<tr>
<th></th>
<th>Big 4</th>
<th>Non-Big 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ROA</td>
<td>ROE</td>
</tr>
<tr>
<td>KPKU</td>
<td>0.020**</td>
<td>0.035**</td>
</tr>
<tr>
<td></td>
<td>(2.29)</td>
<td>(2.12)</td>
</tr>
<tr>
<td>LEVERAGE</td>
<td>-30.878***</td>
<td>-43.540’</td>
</tr>
<tr>
<td></td>
<td>(-2.92)</td>
<td>(-1.89)</td>
</tr>
<tr>
<td>FIRMSIZE</td>
<td>-1.682</td>
<td>-2.294</td>
</tr>
<tr>
<td></td>
<td>(-0.73)</td>
<td>(-0.48)</td>
</tr>
<tr>
<td>FIRMAGE</td>
<td>-1.698</td>
<td>-4.643</td>
</tr>
<tr>
<td></td>
<td>(-0.84)</td>
<td>(-0.96)</td>
</tr>
<tr>
<td>CONSTANT</td>
<td>77.435</td>
<td>116.783</td>
</tr>
<tr>
<td></td>
<td>(1.02)</td>
<td>(0.74)</td>
</tr>
<tr>
<td>Year Dummies</td>
<td>Included</td>
<td>Included</td>
</tr>
<tr>
<td>Industry Dummies</td>
<td>Included</td>
<td>Included</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.592</td>
<td>0.474</td>
</tr>
<tr>
<td>N</td>
<td>47</td>
<td>47</td>
</tr>
</tbody>
</table>

Notes: This table shows the results of multiple linear regression between KPKU Assessment and firm performance in the Companies Audited by Big 4 vs Non-Big 4 that are listed on the IDX in 2009-2018 with ‘t > 1.645, ** t > 1.960, *** t > 2.326, significance at 10%, 5% and 1%.

Furthermore, this study also wants to investigate further whether the relationship between KPKU assessment and firm performance gives different results to big-sized companies compared to small-sized companies. In this second analysis, the distribution of the sample is done by looking at the median value of company size. If the company has a company size above the median value (>31.05362) then it is classified as a big-sized company, conversely if the company has a company size below the median value (<31.05362) then it is classified as a small-sized company.

Table 7 shows the regression results for the big-sized and small-sized companies. It can be seen that the KPKU coefficient in the Big Size column is 0.026 (t=2.71) for ROA, and 0.040 (t=2.05) for ROE. Both specification for big-sized companies indicate that the KPKU assessment is positively and significantly related at the level of 1% and 5%. While the regression results for small-sized companies also showed a positive but not significant
to all proxy company performance, ROA and ROE. These results reinforce some of the previous findings, that the KPKU assessment is positively related to firm performance in large companies. This indicates that in large companies that tend to be stable and well established, KPKU assessment is used as a tool for evaluation or comprehensive assessment that can be useful to improve firm performance. KPKU assessment can direct companies to manage existing resources (Mawirda & Yulihasri, 2019). Thus, complex resources in large companies can be accommodated and managed properly to achieve the goals expected by the organization.

Table 7. KPKU Assessment in the Big Size vs Small Size Companies

<table>
<thead>
<tr>
<th></th>
<th>Big Size</th>
<th></th>
<th>Small Size</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ROA</td>
<td>ROE</td>
<td>ROA</td>
<td>ROE</td>
</tr>
<tr>
<td>KPKU</td>
<td>0.026***</td>
<td>0.040**</td>
<td>0.017</td>
<td>0.033</td>
</tr>
<tr>
<td></td>
<td>(2.71)</td>
<td>(2.05)</td>
<td>(1.49)</td>
<td>(1.33)</td>
</tr>
<tr>
<td>LEVERAGE</td>
<td>-27.336**</td>
<td>-8.654</td>
<td>-33.946***</td>
<td>-52.070**</td>
</tr>
<tr>
<td></td>
<td>(-2.08)</td>
<td>(-0.35)</td>
<td>(-3.84)</td>
<td>(-2.45)</td>
</tr>
<tr>
<td>FIRMAGE</td>
<td>1.735</td>
<td>8.905</td>
<td>-0.032</td>
<td>-1.905</td>
</tr>
<tr>
<td></td>
<td>(0.49)</td>
<td>(1.30)</td>
<td>(-0.03)</td>
<td>(-0.56)</td>
</tr>
<tr>
<td>BIG4</td>
<td>-7.895</td>
<td>-10.001</td>
<td>-1.102</td>
<td>-4.948</td>
</tr>
<tr>
<td></td>
<td>(-1.46)</td>
<td>(-0.98)</td>
<td>(-0.41)</td>
<td>(-0.67)</td>
</tr>
<tr>
<td>CONSTANT</td>
<td>10.510</td>
<td>-19.380</td>
<td>34.711***</td>
<td>67.362***</td>
</tr>
<tr>
<td></td>
<td>(0.52)</td>
<td>(-0.49)</td>
<td>(3.72)</td>
<td>(2.81)</td>
</tr>
<tr>
<td>Year Dummies</td>
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<td>Included</td>
</tr>
<tr>
<td>Industry Dummies</td>
<td>Included</td>
<td>Included</td>
<td>Included</td>
<td>Included</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.599</td>
<td>0.606</td>
<td>0.680</td>
<td>0.528</td>
</tr>
<tr>
<td>N</td>
<td>41</td>
<td>41</td>
<td>41</td>
<td>41</td>
</tr>
</tbody>
</table>

Notes: This table shows the results of multiple linear regression between KPKU Assessment and firm performance in the Big Size vs Small Size Companies listed on the IDX in 2009-2018 with \(^* t > 1.645, \(^{**} t > 1.960, \(^{***} t > 2.326\), significance at 10%, 5% and 1%.

Conclusions

This study examines the relationship between the assessment of Criteria for Performance Excellence (KPKU) and the firm performance of States Owned Company (SOE) companies in Indonesia for the period 2009-2018. The result shows that the relationship between KPKU assessment with firm performance was positive and significant. This indicates that the KPKU assessment can improve company performance by increasing communication and integration, framing organizational goals, and providing feedback on organizational strategies. This result can also be a positive signal for shareholders and investors that the company has good performance. In addition, this study also found that a positive relationship between KPKU assessment and firm performance was stronger in companies audited by Big 4 and in big-sized companies. This is because companies audited by Big 4 and large-sized companies tend to be stable and well established and have good consequences and responsibilities to maintain their reputation so that the KPKU assessment is used as a tool for evaluation or comprehensive assessment that can be useful to improve the firm performance.

This research can clarify our understanding of how performance is valued and provide useful suggestions for improving performance appraisal in organizations. In addition, this research also shows the importance of KPKU assessment in driving the performance of SOEs, so that SOEs can achieve strong growth rates which in turn can become a competitive advantage of the company. Furthermore, the results of this study can be used as a guideline for carrying out the company’s long-term and short-term strategies, using the KPKU as an evaluation tool for reliable and superior management practices. In addition, this study recommends conducting regular KPKU assessments because it can be useful to provide positive signals for shareholders and investors. In addition, further investigation of effective corporate governance practices can be carried out for future research in strengthening the relationship between KPKU assessment and firm performance.
References


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THE GLOBAL BALANCE OF POWER AFTER THE COLD WAR. A POWERMETRIC APPROACH

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Abstract. The states (countries) are playing game of power and interest in the international system (IS) to survive and develop. In this game, the states compete to take the best position in the ranking of power. This allows to pursue their national interests more effectively. States with the greatest power (top states) decide on the polar structure and geostrategic nature of IS at every level (global, regional, local). Investigating the structure (static research) and nature (dynamic research) of global balance of power (GBP) after the Cold War three types of power: economic power, military power and geopolitical power were taken into consideration. The results of theoretical and empirical research are relevant to the decision-making process of the political system of states directly or indirectly involved in the international security.

Keywords: international system; powermetrics; economic power; military power; geopolitical power; militarization

Reference to this article should be made as follows: Białoskórski, R. 2020. The global balance of power after the cold war. A powermetric approach. Journal of Security and Sustainability Issues, 9(3), 1089-1104. https://doi.org/10.9770/jssi.2020.9.3(32)

JEL Classifications: C02

1. Introduction

There are a lot of attempts in scientific literature to search for links between economic development dimensions and various facets of security of a country (e.g. Rogalev et al., 2018; Mikhaylov et al., 2018; Korauš et al., 2019; Faridi, Sulphey, 2019; Moumen et al., 2019; Vigliarolo, 2020; Chehabeddine, Tvaronavičienė, 2020).

The purpose of this article differs from those studies. We raise the following fundamental questions in different kind of social studies like the international relations or security studies: (1) what is the structure (nature) of the international system after the Cold War in respect of global balance of an economic, military and geopolitical power? (2) what is the dynamic characteristics of this transformation? (3) what are the main determinants of this transformation process?

Many proposed approaches to this issue assume a bipolar structure of the international system now, but without specifying the field, solid criteria and in the absence of formal research. In this situation, the use of rather little-known powermetric methods seems valuable. Powermetrics is a new term, combining two concepts – ‘power’ and ‘metric’. Powermetrics is the applied science dealing with measurements, assessments and evaluation of public life participant’s (actors) power, particularly of states, and the modelling, simulation and forecast of relationship between them in global, regional and local dimensions. The synthetic concept of power (economic power and military power) evaluated according to a formal powermetric model meets the different concepts of power as soft power, hard power, smart power or sharp power and efficiently integrates all these concepts.
Many powermetric formal models have been already developed (Höhn, 2011). Among them, the formal model developed by Mirosław Sulek, a professor at the Institute of International Relations at the Warsaw University (further: Sulek formal model) deserves special attention, as a the modern and most effective synthetic approach. Other approaches have generally outdated indicators, such as steel production in the Wilhelm Fucks model or are based on the expert methods. Sulek formal model is focused on two main areas: (1) economic – resulting from the desire to rationalize the costs (expenditures) of the development and defence in the certain circumstances and conscious of their formation and (2) political-military – resulting from the desire to occupy the best position and to play the best role in the international system.

The states are striving for survival and development, in order to get maximum power, competing for limited global resources. This causes dynamic changes (in time and space) in GBP. To maximize the power in GBP, states must have the correct strategy and the will to achieve their national interests (goals). GBP is a game of power and interests, which takes the form of a permanent rivalry for the best position in the hierarchy. The rivalry between States is a so-called zero-sum game, where winning of one side is a loss the other side with the same size. In the GBP, a global power is always equal to 100%, while the ratio of states power is constantly changing. The rivalry between states for the limited global resources (‘source of life energy’) takes two forms: (1) cooperation (trade resources) or (2) struggle (taking other people’s resources). The cooperation is a so-called positive-sum game, where all players profit, though in different degree. Struggle (in a different spheres: political, economic, military etc.) is a so-called negative-sum game, in which all players lose, though in different degree. Thus, in constant competition for maximum share of power, states alternate between cooperation and struggle, depending on the specific conditions. Studying changes in the GBP in the economic, military and geopolitical dimensions, the current international system can be reliably determined, especially in geostrategic studies. The period of a research has been established between 1992 (dissolution of the USSR) and 2018 (currently available source data).

2. Theoretical background

Powermetrics is a new term, introduced by the Polish scientist Mirosław Sulek (Sulek, 2013, p. 23–27), combining two concepts – ‘power’ and ‘metric’. It has been adopted on the ground of Polish science. Powermetrics is an applied science, dealing with the measurement and evaluation of the power of political units, especially states (nations) and forecast the relation between them on a global, regional and local scale using of models and simulations scientific methods. The powermetric research focused on two main areas: (1) economic – resulting from the desire of rationalizing the development costs and defence in the certain circumstances and understanding of their formation; (2) political-military – resulting from the desire of occupying the best position and to playing the best role in the international distribution system.

The states strive for survival and development, in order to get maximum power, competing for limited global resources. This causes dynamic changes (in time and space) in the GBP. However, from the historical perspective, these changes are slow (there are periods of acceleration), which means that it is not possible to change GBP in a short time. A key sources of change of GBP is the uneven development of superpowers, causing a permanent shift of ‘power centres’ on the world map (in global, regional and local dimensions). The present GBP has a large inertia. It is a subject of constant fluctuations – causing increases or decreases in the number of main players, the stability of the international system, the mutual hostility etc. These changes are usually slow, reminding the tectonic motions, sometimes ending in unexpected changes (‘earthquakes’). But even in this case (e.g. after the end of the cold war) these changes are not so rapid, because their potential is increasing in time. It was very often unnoticed or under-valued. The synthetic research usually requires the formal models or expert estimates. The sector research requires more specialized knowledge. GBP can also be studied statically (at the moment; at the short period of time) or dynamically (the significant changes, trends, directions at the long period of time). GBP can also be studied geographically – due to the location of states with the specific power on the world map. This allows determining the distribution between the major powers and the continents and the direction of changes. There are also other criteria of the GBP analysis, such as: balance, stability, polarity, level of political and military tension (escalation), which are closely associated not only with a particular GBP, but also with the interests of the individual states (Sulek, 2013, pp. 19–23).
To maximize the power in GBP, states must have the correct geostrategy and the will to achieve their national interests (goals). GBP is a game of forces and interests, which takes the form of a permanent rivalry for the best position in the hierarchy. The rivalry between states is a so-called zero-sum game, where winning of one side is a loss the other side with the same size. In the GBP, a global power is always equal to a one hundred percent, while the ratio of states power is constantly changing. The rivalry between states for the limited global resources (“source of life energy”) takes two forms: (1) cooperation (trade resources) or (2) struggle (taking other people’s resources). The cooperation is a so-called positive-sum game, where all players profit, though in different degree. Struggle (in a different spheres: political, economic, military etc.) is a so-called negative-sum game, in which all players lose, though in different degree. Thus, in the permanent rivaling for a maximum share of power, states cooperate and struggle, depending on the specific conditions (Sułek, 2013, pp. 23–27). The rivalry between states to maximize their power depends on the interaction of their national interests determined by the political system (authority) and the conditions for their implementation. Thus, states have to calculate the possibility of pursuing their national interests according to their power and will of society (in democratic system) or hard decision of leader(s) (in an autocratic regime). The powermetric study based on the quantitative and qualitative methods of the research of the international distribution of power seems to be very useful in the geostrategic studies (Białoskórski, 2018). This research was limited to the application of a formal model of measurement of power of states, as as the main players of the international system. The studies therefore omitted the use of other indicators and non-state actors. Among different approaches (Höhn, 2011) I have adopted the modern powermeric model developed by Mirosław Sułek (Sułek, 2013). This model recognises three types of power: (1) economic power (EP), (2) military power (MP) and (3) geopolitical power (GP). There are also derived indicators of power, such a militarization. Three types of militarization are distinguished: economic militarization (m_e), GDP militarization (m_GDP) and demographic militarization (m_d).

3. Research objective and methodology

The rivaling in the international system, states are still approaching to maximize their power in form of socio-logical power. This concept refers to cybernetic theory of known Polish scientist Marian Mazur and considers a power in the category of sociological power. There are two principle forms of sociological power of state: (1) Internal power – within political system of state and (2) External power – in the international system. (Mazur, 1996, p. 183). It relies on establishing proportions between cooperation and struggle (and therefore changing management standards) in order to achieve the best ratio of power. The international relations are synthesis of cooperation and struggle, in different spheres and proportions, determined during rivalry. In the GBP, the states pursue their goals defining a potential (capability) and employing social support (will) and appropriate strategy. In general approach, the national power is the product of tangible, intellectual and spiritual potential (Sułek, 2010, p. 98) & (Moczulski, 1999, p. 402–403):

\[ NP = TP \times IP \times SP \]

Where:
- NP – national power,
- TP – tangible potential,
- IP – intellectual potential,
- SP – spiritual potential.

It can be also expressed as the product of national resources (potential), strategy and will to pursue national strategy by the political unit:

\[ NP = R \times NS \times W \]

Where:
- NP – national power,
- R – resources,
- NS – national strategy,
- W – will to pursue of national strategy.
In both formulas, the tangible potential (resources) relates to presented synthetic concept of economic power (EP), military power (MP) and geopolitical power (GP). On the basis of these three sort of powers, it has been also estimated the level of power status (PS). Assuming, that the expression of the organizational and production ability or the collective action ability is the stream (flow) of the gross domestic product (GDP) in time. The economic power can be understood narrowly or broadly. In the narrow meaning of the main component of economic power is the value of GDP expressed in time, while in a broad sense, the expression of economic power are also demographic and spatial (territory) factors, which are an expression of the general power. In reflection, I took the view of a broad economic power, which part is the military power. Having regard to the above, the economic power can be expressed by the formula (where the exponent values were determined by the deductive method):

\[
EP = (GDP)^{0.652} \times L^{0.217} \times a^{0.109}
\]

Where:
- EP – economic power (Sułek, 2001, pp. 87–97),
- GDP – gross domestic product,
- L – population,
- a – area (territory).

Concept of military power (MP) formal (synthetic) model is based on economic power approach (EP) stressing the total character of state power, including military power. Assuming that the expression of organizational and production skills (ability to collective activity) is the stream of military expenditures (expressed in time unit), the military power can be expressed by the following formula (please note that the synthetic model takes into account the military power as conventional military power without nuclear factor, so the nuclear power factor has to be research separately):

\[
MP = (MEX)^{0.625} \times S^{0.217} \times a^{0.109}
\]

Where:
- MP – military power,
- MEX – military expenditures,
- S – soldiers (active),
- a – area (territory).

The concept of geopolitical power (GP) formal (synthetic) model is based on economic power (EP) and military power approach stressing the total character of state power, including economic power and military power. Geopolitical power is expressed by the following formula:

\[
GP = \frac{EP + (2 \times MP)}{3}
\]

Where:
- GP – geopolitical power,
- EP – economic power,
- MP – military power.

This model has assumed that the power of the world is a whole and equals 1. The power of each state is therefore a fraction (share) of this size. To clarity of the presented results, the fractions can be multiplied by any number, e.g. if we multiply them by 100, we will get results in percent of the world’s power (i.e. world=100%). It can be also multiplied by 1000 (then the power of the world=1000), and express it in the millimir (mM), where the basic unit of 1 mir as an expression of the world power (“mir” stands for “world” in the Russian language) means, the thousandths of the total world power. There are three types of militarization indicator: (1) economic militarization ($m_e$), (2) GDP militarization ($m_{GDP}$) and (3) demographic militarization ($m_d$). The militarization indicators are dimensionless quantities. The economic militarization indicator is the ratio of military power to economic power. The economic indicator can be also interpreted as an indicator of mobilization, because it
demonstrates how many part of the resources was allocated (mobilized) for military (defence) purposes. It can be also treated as an indicator of a defensive readiness:

\[ m_e = \frac{MP}{EP} = \frac{MEX^{0.652}}{GDP^{0.652}} \times S^{0.217} \times a^{0.109} \]

After a mathematical simplification, the formula will take the form:

\[ m_e = \left( \frac{MEX^{0.652}}{GDP^{0.652}} \right) \times \left( \frac{S^{0.217}}{L^{0.217}} \right) \]

It can be seen that the economic militarization indicator is the product of two partial indicators - GDP militarization and demographic militarization:

\[ m_{GDP} = \frac{MEX^{0.652}}{GDP^{0.652}} \quad m_d = \frac{S^{0.217}}{L^{0.217}} \]

The above indicators are important means of describing the security and defence policy of states. These indicators inform us about the type of military strategy of the states and about readiness to implement it. We can distinguish two extreme cases: first, when the indicator of the militarization of GDP is high, and the demographic militarization is low and the second - the opposite. There are also a large number of intermediate situations.

As a polarity criterion to recognize every (global, regional and local) international system as a unipolar, bipolar or multipolar, I have adopted an algorithm of comparing the ratios of the largest powers of states in the ranking: the first with the second (P1/P2), the first with the third (P1/P3) etc. If P1≥2×P2 - the system is unipolar with one pole - P1. If P1≤2×P2 – the system is bipolar with two poles - P1 and P2. If P1>2×P3 – the bipolar system is established. If P1≤2×P3 – the system is multipolar with three poles - P1, P2 and P3. The next poles of the system can be recognized in the same way. This concept of at least a two-fold advantage of the leader’s power state over another ranking country comes from the theory of social cybernetics (Kossecki, 1981, p. 450).

The measurement of the economic, military and geopolitical power status (PS) is based on a concept of the synthetic measure of the economic power relative to a percentage of the global value calculated in Sulek formal model. It has been adopted the following economic, military and geopolitical PS categories designated on the measuring scale from 1 to 5 from the smallest to largest, where: 1 – local power (1.0-3.0%); 2 – regional power (3.0-7.0%); 3 – great power (7.0-12.0%); 4 – world power (12.0-18.0%) and 5 – superpower (>18.0%).

4. Results and discussion

4.1. The global balance of economic power

Taking under consideration the ranking of the economic power in 2018 it can be easy concluded that the global balance of economic power is the bipolar system with two global poles: China and the United States (U.S.) (Figure 1 & Table 1). The adopted polarity criterion is in bipolar system completed:

\[ P_{1,\text{CHINA}} = 15.68\% / P_{2,\text{U.S.}} = 14.91\% = 1.05 (\leq 2.0); P_{1,\text{CHINA}} = 15.68\% / P_{3,\text{India}} = 4.82\% = 3.25 (> 2.0). \]

Similarly, in the case of the unipolar balance of economic power with the one pole of the United States in 1992, we obtain: \[ P_{1,\text{U.S.}} = 15.92\% / P_{2,\text{Japan}} = 6.86\% = 2.32 (> 2.0). \]
Figure 1. Bipolar balance of the economic power in 2018 relating to the unipolar systems in 1992 and 2005 (world=100%)

Source: Own elaboration.

China is the most winner of the transformation of the global economic system after the Cold War. China’s massive growth of the economic power (+11.93%) has changed dominated by the United States unipolar system in 1992 into the bipolar economic system in 2018. At that period of time, the U.S. economic power dropped slightly (-1.01%). Such a dynamic growth of the economic power of China means further opportunities for the growth of its military power and geopolitical power (Figure 2 & Table 1).

Figure 2. The economic power of China and the United States in 1992-2018 (world=100%)

Source: Own elaboration.

India has taken 3 rank with the high increase in 1992-2018 (+2.45%), but it does not appear as the future potential pole of the global economic system. For many researchers, it may be surprising that Japan is the biggest loser in the post-cold global economic system. Losses of Japan in the economic power value in 1992-2018 reach almost 50% (-3.47%). Russian Federation has maintained its status quo in this system on the 7th position with a slightly decrease (-0.09%). This means that Russia is in a deep economic recession from 1992. The old Western European states belong also to the main losers of the global economic system (Table 1).
Table 1. The economic power of the top 30 states in 2018 and its changes relating to 1992 (world=100%)  

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
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<td>China</td>
<td>1</td>
<td>15.679</td>
<td>4</td>
<td>3.748</td>
<td>+3</td>
<td>+11.930</td>
</tr>
<tr>
<td>United States</td>
<td>2</td>
<td>14.911</td>
<td>1</td>
<td>15.922</td>
<td>-1</td>
<td>-1.010</td>
</tr>
<tr>
<td>India</td>
<td>3</td>
<td>4.818</td>
<td>9</td>
<td>2.426</td>
<td>+6</td>
<td>+2.393</td>
</tr>
<tr>
<td>Japan</td>
<td>4</td>
<td>3.391</td>
<td>2</td>
<td>6.857</td>
<td>-2</td>
<td>-3.466</td>
</tr>
<tr>
<td>Brazil</td>
<td>5</td>
<td>2.812</td>
<td>10</td>
<td>2.290</td>
<td>+5</td>
<td>+0.523</td>
</tr>
<tr>
<td>Germany</td>
<td>6</td>
<td>2.671</td>
<td>3</td>
<td>4.174</td>
<td>-3</td>
<td>-1.503</td>
</tr>
<tr>
<td>Russian Federation</td>
<td>7</td>
<td>2.582</td>
<td>7</td>
<td>2.676</td>
<td>0</td>
<td>-0.094</td>
</tr>
<tr>
<td>France</td>
<td>8</td>
<td>2.113</td>
<td>5</td>
<td>3.123</td>
<td>-3</td>
<td>-1.010</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>9</td>
<td>1.951</td>
<td>8</td>
<td>2.541</td>
<td>-1</td>
<td>-0.590</td>
</tr>
<tr>
<td>Canada</td>
<td>10</td>
<td>1.841</td>
<td>11</td>
<td>2.065</td>
<td>+1</td>
<td>-0.224</td>
</tr>
<tr>
<td>Indonesia</td>
<td>11</td>
<td>1.716</td>
<td>17</td>
<td>0.961</td>
<td>+6</td>
<td>+0.754</td>
</tr>
<tr>
<td>Mexico</td>
<td>12</td>
<td>1.631</td>
<td>13</td>
<td>1.618</td>
<td>+1</td>
<td>+0.013</td>
</tr>
<tr>
<td>Italy</td>
<td>13</td>
<td>1.596</td>
<td>6</td>
<td>2.779</td>
<td>-7</td>
<td>-1.183</td>
</tr>
<tr>
<td>Australia</td>
<td>14</td>
<td>1.477</td>
<td>14</td>
<td>1.234</td>
<td>0</td>
<td>+0.243</td>
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<tr>
<td>Spain</td>
<td>15</td>
<td>1.253</td>
<td>12</td>
<td>1.679</td>
<td>-3</td>
<td>-0.426</td>
</tr>
<tr>
<td>Korea, Rep.</td>
<td>16</td>
<td>1.164</td>
<td>16</td>
<td>0.981</td>
<td>0</td>
<td>+0.183</td>
</tr>
<tr>
<td>Turkey</td>
<td>17</td>
<td>0.990</td>
<td>18</td>
<td>0.773</td>
<td>+1</td>
<td>+0.217</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>18</td>
<td>0.925</td>
<td>22</td>
<td>0.610</td>
<td>+4</td>
<td>+0.315</td>
</tr>
<tr>
<td>Nigeria</td>
<td>19</td>
<td>0.793</td>
<td>30</td>
<td>0.409</td>
<td>+11</td>
<td>+0.384</td>
</tr>
<tr>
<td>Argentina</td>
<td>20</td>
<td>0.771</td>
<td>15</td>
<td>1.010</td>
<td>-5</td>
<td>-0.239</td>
</tr>
<tr>
<td>Thailand</td>
<td>21</td>
<td>0.695</td>
<td>23</td>
<td>0.593</td>
<td>+2</td>
<td>+0.103</td>
</tr>
<tr>
<td>Pakistan</td>
<td>22</td>
<td>0.678</td>
<td>29</td>
<td>0.418</td>
<td>+7</td>
<td>+0.260</td>
</tr>
<tr>
<td>Poland</td>
<td>23</td>
<td>0.636</td>
<td>26</td>
<td>0.460</td>
<td>+3</td>
<td>+0.176</td>
</tr>
<tr>
<td>South Africa</td>
<td>24</td>
<td>0.598</td>
<td>21</td>
<td>0.675</td>
<td>-3</td>
<td>-0.077</td>
</tr>
<tr>
<td>Netherlands</td>
<td>25</td>
<td>0.562</td>
<td>19</td>
<td>0.712</td>
<td>-6</td>
<td>-0.150</td>
</tr>
<tr>
<td>Philippines</td>
<td>26</td>
<td>0.546</td>
<td>34</td>
<td>0.353</td>
<td>+8</td>
<td>+0.193</td>
</tr>
<tr>
<td>Colombia</td>
<td>27</td>
<td>0.533</td>
<td>31</td>
<td>0.378</td>
<td>+4</td>
<td>+0.155</td>
</tr>
<tr>
<td>Egypt, Arab Rep.</td>
<td>28</td>
<td>0.511</td>
<td>36</td>
<td>0.338</td>
<td>+8</td>
<td>+0.174</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>29</td>
<td>0.483</td>
<td>42</td>
<td>0.258</td>
<td>+13</td>
<td>+0.225</td>
</tr>
<tr>
<td>Sweden</td>
<td>30</td>
<td>0.473</td>
<td>20</td>
<td>0.700</td>
<td>-10</td>
<td>-0.226</td>
</tr>
</tbody>
</table>

Legend: China and The United States – the pole-states

Source: Own elaboration on the basis of Sulek formal model and data from: The World Bank.
Retrieved September 05, 2019, from https://data.worldbank.org

In order to answer the question about the main factors of changes in the global economic system, the dynamics of the economic power factors in period of 1992-2018 has been researched. The land area (territory) it can be assumed as a constant (China – 7.37%; U.S.– 7.18%), so let’s take into account the other economic power’s factors, i.e. GDP and population (L). The GDP factor is the most important (with the greatest weight) in the Sulek formal model. The China’s GDP grew in the researched period +14.18% with the U.S. decline of -1.76% (world=100%). This is the main factor of the China’s pole success in economic power, while the population index of both China and the U.S. is declining (China -3.02% and U.S. -0.39%). Analogical, the main reason for the fall of the economic power of Japan is a drastic decrease of GDP factor (-9.58%) with a decline in the population factor (-0.61%). Taking under consideration the dynamic of economic power status, it can be concluded, that there is no a superpower state in the bipolar economic system. The two pole-states – China and the United States has taken the level of world power (WP). Three states – India and Japan have positioned regional power.
(RP), and the others – Brazil, Germany, Russian Federation, France, United Kingdom and Canada only – local power (LP). This means the increasing position of power status of China (two positions) and India (one position). Germany has lost one position from regional economic power to local power. The other states basically maintained their positions from 1992. Noteworthy is the only local economic power status of the ‘old’ European countries (Germany, France and the United Kingdom) and the Russian Federation.

4.2. The global balance of military power

In 2018, the global balance of military power is still unipolar system with the United States on the top, but the China has been growing up military ca. 83% since 1992 (Figure 3 &Table 3). The adopted polarity criterion is in unipolar system completed: \( P_{U.S.} = 22.62\% / P_{CHINA} = 10.33\% = 2.19 (>2.0) \). Similarly, in the case of the military unipolar system with the one pole of the United States in 1992, we obtain: \( P_{U.S.} = 19.62\% / P_{RUS} = 6.93\% = 2.83 (>2.0) \).

![Figure 3. Unipolar balance of the military power in 2018 relating to the unipolar systems in 1992 and 2005 (world=100%)](image)

Source: Own elaboration

Among the top 30 states in ranking of the military power in 2018, China has done the biggest progress of the dynamic (+5.73%) related to the United States (+2.99) in 1992-2018 (Figure 4 & Table 3).
Figure 4. The military power of China and the United States in 1992-2018 (world=100%)

Source: Own elaboration

With a high growth rate of the Chinese military expenditures (MEX) (+7.37%), significant growth dynamics of the economic power (+11.93%), increasing of the MEX of the United States (9.07%) and India (2.56%) and decreasing of the MEX of the Russian Federation (-2.11%) in 1992-2018, China is undoubtedly the potentially second pole of the military international system in the coming decade. The above changes on a military ‘chess-board’ have positively influenced the position of India by four places from 7 to 3. However, it is difficult to treat India as the potential third pole of the military system. In addition to India, the Saudi Arabia and Brazil have also advanced in the system. Outside of Russia, the biggest losers in the military system are the states of Western Europe (Germany, France, United Kingdom and Italy). This is not a good forecast for the military role of the European Union in the global security system (Table 3).

Table 3. The military power of the top 30 states in 2018 and its changes relating to 1992 (world=100%)

<table>
<thead>
<tr>
<th>State</th>
<th>2018 Rank</th>
<th>MP [%]</th>
<th>1992 Rank</th>
<th>MP [%]</th>
<th>Change of Rank</th>
<th>Change of MP [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>1</td>
<td>22.618</td>
<td>1</td>
<td>19.622</td>
<td>0</td>
<td>+2.996</td>
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<tr>
<td>China</td>
<td>2</td>
<td>10.326</td>
<td>3</td>
<td>4.592</td>
<td>+1</td>
<td>+5.733</td>
</tr>
<tr>
<td>India</td>
<td>3</td>
<td>4.218</td>
<td>7</td>
<td>1.651</td>
<td>+4</td>
<td>+2.567</td>
</tr>
<tr>
<td>Russian Federation</td>
<td>4</td>
<td>3.910</td>
<td>2</td>
<td>6.928</td>
<td>-2</td>
<td>-3.018</td>
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Legend: N/A – no data available for formula calculation; The United States – the pole-state


There is the only one superpower (SP) in the unipolar military global system - the United States, holding this position since 1992. The second pole – China, has been promoted from regional power (RP) to great power (GP). India and Saudi Arabia have been promoted from local power (LP) to regional power (RP). The Russian Federation has maintained its position of regional power (RP). Brazil, Japan, France, the United Kingdom and Korea Republic have maintained the only position of local military power (LP), as well as Germany, but first time outside the top 10 states since 1992 (rank 11).

4.3. The global balance of geopolitical power

A geopolitical power expresses a kind of balance between economic power and military power in the formal model. In the period of 1992-2018 this system has been changed from a unipolar (one geopolitical pole - the United States) to a bipolar (two geopolitical poles - the United States and China) (Figure 5).

The adopted polarity criterion in bipolar geopolitical system is completed: \( P_{1, \text{US}} = 20.049\% \), \( P_{2, \text{CHI-NA}} = 12.110\% \), \( P_{1, \text{US}} = 20.049\% \), \( P_{3, \text{INDIA}} = 4.418\% \). >2.0).\)

Similarly, in the case of the geopolitical unipolar system with the one pole of the United States in 1992, we obtain: \( P_{1, \text{US}} = 18.389\% \). 4.311\% =4.27 (>2.0).\)
China is the most winner of the transformation of the international geopolitical system after the Cold War. China’s massive growth of the economic power (+11.93%) and increase of the military power (+5.73%) has changed dominated by the United States unipolar geopolitical system in 1992 into the bipolar geopolitical system in 2018. At that period of time, the China’s geopolitical power has increased +7.799%, while the U.S. geopolitical power has increased slightly (+1.661%) (Figure 6 & Table 5).

**Figure 5.** Bipolar balance of the geopolitical power in 2018 relating to the unipolar systems in 1992 and 2005 (world=100%)

*Source: Own elaboration*

**Figure 6.** The geopolitical power of China and the United States in 1992-2018 (world=100%)

*Source: Own elaboration*
Table 5. The geopolitical power of the top 30 states in 2018 and its changes relating to 1992 (world=100%)

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Legend: N/A – no data available for formula calculation; The United States and China – the pole-states


There is the only one superpower (SP) in the bipolar geopolitical global system in 2018 - the United States, holding this position since 1992. The second pole – China, has been promoted from regional power (RP) to world power (WP). India has been also promoted from local power (LP) to regional power (RP). The Russian Federation has lost its position of regional power (RP) in 1992 and great power (GP) in 1993-1995 to regional power (RP) in 2018. Japan has also lost its position of regional power (RP) to local power (LP). Germany, France, the United Kingdom, Brazil and Saudi Arabia maintained the only position of local geopolitical power (LP).

4.4. The militarization and global balance of power

The nature of pole structure of the international system is also reflected by the militarization indicators, i.e. economic militarization, GDP militarization and demographic militarization (Table 7).
The research clearly shows that the biggest winner of changes in the international system after the Cold War relating to economic power, military power and geopolitical power is China. It was possible primarily due to the highest increase of China’s economic, military and geopolitical power, with the rather stable dynamic of U.S. power (Figure 7).

![Figure 7. The dynamic of economic power, military power and geopolitical power of the United States and China in 1992-2018](image)


This conservative attitude of the United States in the dynamic of power in 1992-2018 may indicate the saturation of the American economy and the lack of significant reserves of its development in relation to China’s capabilities. America is a much more economic militarized state than China. The U.S. economic militarization rate ($m_{E}=MP/EP$) is almost double highest of China, with a value of China below the level of the world (1.0) (Table 7). China, as a state with the highest level of the economic power in 2018 and the highest dynamic of power after the Cold War, it can be also seen as the future second pole-state in the military international system. It is enough for China to significantly increase military expenditures (probably higher than official data), which is possible by the huge economic power. The China’s level of military spending is currently not high in relation to economic capabilities. The development of China’s military power is currently focused on increasing the power of naval forces in the South China Sea region (estimated by American high diplomats as “increasingly provocative”). The China’s global military aspirations are currently based on the nuclear deterrence (China is developing a strategic bomber to be launched in 2025). Meeting this rivalry with China requires considerable economic and military involvement of the United States, which is not easy due to the considerable economic and military saturation.

![Table 7. The ranking of militarization of top 30 states in 2018](table)

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## 5. Conclusions

The research on the first scientific problem of the structure (nature) of the international system after the Cold War leads to the following conclusions: (1) There is no one “universal” concept of the international system, so it requires a vector approach in studying its nature; (2) A powermetric approach based on measurement of three categories of power of state leads to three types of the international system: (a) bipolar economic international system with China and the United States as the two pole-states; (b) unipolar military international system with the United States as the only one pole-state; (c) bipolar geopolitical international system with the United States and China as the two pole-states; (3) The other states of these systems are in the orbit of influence of the pole-states. This study is based on the sources data from 2018, but this trend should continue in the coming years. China should maintain its position of an economic leader and strengthen its position as a military power (competing with the U.S. for a second pole-state position) and geopolitical power (reducing the distance to the U.S.).
The dynamic research diagnoses the main determinants of the balance of power in the international system (the second and third scientific problem). There was a dynamic increase in the economic, military and geopolitical power of China with the relative stagnation of US development in period of 1992-2018. The main determinants of these changes is the dynamic growth of China’s GDP and increasing military expenditures. The Russian Federation is the only a local economic power with a downward trend and a regional military power. In total, this places Russia at the level of a regional geopolitical power with the unreal ambitions of a superpower. India’s third power in the rankings is significant but without real chances for the position of a polar-state. Japan and Western European countries are the main losers of the international system.

References


The Military Balance (2018), London: International Institute for Strategic Studies


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CIVIL-MILITARY COOPERATION IN DISASTER PREPAREDNESS: INFORMATION SHARING AND SUPPORT IN LITHUANIA

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Abstract. The purpose of civil-military cooperation is to exchange resources and information to effectively manage different types of disasters. In this regard, civil-military cooperation in disaster preparedness should increase coherence in the area of information sharing and mutual support. The purpose of this study is to examine how cooperation between municipal institutions and the same nation’s military meets these requirements. The results presented in the article show that cooperation between municipal institutions and military personnel of the same nation is similar to civilian and military cooperation in international missions or disaster relief. This cooperation is based on a mutual understanding of the value of cooperation; willingness to cooperate and mutual support. At the same time, there are objective obstacles to the effectiveness of cooperation in disaster preparedness between municipal institutions and the military, mainly related to legal regulation, bureaucracy and hierarchy, often impeding the dissemination of information and undermining mutual trust between institutions. The study found that simplification of existing legislation, detailed planning process, information sharing during joint exercises and other joined activities would be important factors in improving civil (municipal)-military cooperation in disaster preparedness.

Keywords: civil-military cooperation; disaster management; disaster preparedness; municipal, military; information sharing


JEL Classifications: O2

1. Introduction

Referring the patterns of disasters and its impact there has been a conceptual shift in disaster preparedness over lasts few decades. Extreme events generate secondary catastrophic events of strong impact on society and infrastructure (Kelman, 2018), therefore the preparation for new type of these cascading disasters requires effective inter-institutional cooperation. Globalization and climate change is followed by violent conflicts (Brzoska & Fröhlich, 2016) where disruptive and game changing technologies creates new risks (Kosal, 2020). In this context civil-military cooperation is becoming more relevant than ever.

Civil-military cooperation is intended to achieve an exchange of resources and knowledge to handle different kinds of disasters efficiently (Kaneberg, Hertz, & Jensen, 2016). An intention for exchange of resources and knowledge is of higher importance when disaster occurs. With regard to his, it is argued that civil-military cooperation in disaster preparedness has to increase coherence (Ankersen, 2008) to overcome duplication and inefficient use on human and other resources.
This topic is clearly apparent in a definition of disaster preparedness by the UNDPR (United Nations International Strategy for Disaster Reduction, 2009) where preparedness is “the knowledge and capacities developed by governments, professional response and recovery organizations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions” (p. 21). In this regard, the issue of cohesion in cooperation is of great concern. According to UNDPR (United Nations International Strategy for Disaster Reduction, 2009), referred by scholars and practitioners who follow UN approach, disaster is “a serious disruption <…> which exceeds the ability of the affected community or society to cope using its own resources” (p.9). Accordingly, it is not enough to delegate disaster preparedness for local communities and local authorities. As disasters pose an extreme test for public actors, disaster preparedness requires integration of actions and resources into a “functioning response system” (Kapucu, 2009). Multilevel civil-military cooperation that interlinks national, regional and local levels is required for contemporary disaster preparedness especially in the face or hybrid threads (Cusumano & Corbe, 2017a; Cusumano & Corbe, 2017b). As the frequency and complexity of disasters is growing and probability of risks for disaster is increasing (Fang et al., 2019), disaster preparedness needs to include pre-disaster planning and exercising. Civil-military cooperation can be perceived not only in a traditional way where two distinct entities - civil and military bringing their impact while managing disaster, but in a more broader since where, according to Spence (2002), civil-military cooperation is perceived as an environment where actors are placing military and civil contribution, balancing political, economic, social and military objectives.

Military’s participation in local as well national disaster management is increasing. According to Madiwale and Virk (2011) it is grounded on two reasons. The first is based on public demand as perception on military is changing as humanitarian operations where military was participating in the last few decades shows its extra ordinal competence in disaster management. The second is based on changing nature of conflicts when military has to “diversify their role and expertise” (Madiwale & Virk, 2011). Military participation in local disaster management cannot be understood as mere involvement of military forces. As Gourlay (1999) points out, “military” is not a monolithic concept, it represents a set of very diverse institutions. In some cases, these institutions are largely civilian in nature, and may be different in structure, size or capability. It depends on the nature of the disaster.

When analyzing civil-military cooperation, it is important to note that it follows the basic principles of inter-institutional cooperation. According to Vangen (2017), institutions collaborate across sectoral boundaries “to deal more effectively with complex, multifaceted issues and problems that are beyond individual organizations’ capabilities to tackle effectively on their own” (p.264). The differences between institutions create unique capabilities that include diverse areas of expertise, physical resources and etc. where all together a synergy is formed during collaborative activities. The paradox of cooperation lays in the facts that on one hand the more diverse the institutions are, the more complex their collaboration, and on other hand the diversity create greater synergy. In this way, disasters create an inevitable need for cooperation, as institutions are no longer able to cope with loses using their own resources. The situation is completely different in a phase of disaster preparedness. There is no urgent need for cooperation. Institutions should therefore be encouraged to cooperate. The cooperation between military and public sector institutions occurs only if favourable circumstances occur: institutions operate under a common regulatory framework and they are united by common tasks and objectives (Jimenez Aguilar & Thoene, 2019; Kuprijanova, Volkova, & Agafonova, 2018). More specifically, Spence (2002) sets out seven conditions for effective civil-military cooperation: environment, common understanding, communication imperative, appropriate responsibilities, comprehensive approach, timely leadership and early engagement. In the phase of disaster preparedness communication imperative and appropriate responsibilities are of the greatest demand. As Palttala et al. (2012) points out, the main question of how to implement communication imperative and appropriate responsibilities when institutions are “from different organizational cultures and structures, which need to cooperate in managing a crisis” (p.5).

The answer to this question is not straightforward, since different paradigms assume different roles for collaborating institutions. Taking a classical disaster preparedness approach, civil authorities are partners of the military in defence of national security. The modern view states that military is a key supporter in civilian emer-
gency and terrorism response (Sylves, 2014). These two approaches reveal interdependencies that encourage cooperation in practice. It suggests that civilian-military cooperation in disaster preparedness is based on the inevitability when authorities find that working together the goals could be achieved more effectively. Despite the common objectives, the concepts on which civilians and military institutions rely in the face of disaster are different: the humanitarian principles on which independent civil society is based versus military doctrines, where civil defence involves an entire society (Kaneberg et al., 2016). Additionally, differences in civil and military culture embed lack of trust (Dubey et al., 2019). In this context, it can be argued that civil-military cooperation faces similar challenges as cooperation between different civic organizations: information and knowledge sharing is limited. (see Branten and Purju (2015). Consequently, of the one part, civil institutions and civil society are not aware of the military capacities needed to help civilians to function during a disaster (Kaneberg et al., 2016), of the other part, military is hidden from the knowledge of real capacity of civil society coordinated by civil authorities.

These issues are of critical importance for the countries seeking for balanced approach toward civilian “all-hazards approach” and military concept of “total defence” and where disaster preparedness involves both civil and military. The purpose of this study is to identify further opportunities for civil-military cooperation in disaster preparedness on the municipal-military level by stressing on information sharing and mutual support in this process. The case of Lithuania is chosen for this study as country faces challenges for national security as consequence of changing geopolitical environment as well as risks related with global climate changes and other natural and human-made disasters.

The study takes into consideration the views and insights from both sides of civil-military cooperation. Specifically, this study investigates the principles and forms of civil (municipal)-military cooperation in disaster preparedness, advantages and obstacles of this cooperation and finally, opportunities to enhance municipal-military cooperation in disaster preparedness. Thereafter the paper is structured as follows. Section 2 presents qualitative research methodology used for this study. Section 3 provides detailed information on research finding. Findings are commented in the light of literature, as literature was used in the process of research. Paper concludes on section 4 where main conclusions and discussion are given. The study is limited to municipal-military cooperation in the process of disaster preparedness and ignores their cooperation in other stages of disaster management as mitigation, disaster response and recovery. In this way it differs from previous research in the field and extends the body of knowledge on disaster preparedness.

2. Research methodology

Research method and sampling. A qualitative study was chosen for this research. Semi-structured interviews with representatives of military and municipal institutions were performed in a period of October-November in 2019. “Military” in this context is understood as the totality of the institutions of the national defence system, where term “armed forces” used in this research is understood as country’s military forces. This understanding is based on Gourlay’s (1999) interpretation of military concept where she notes drivers’ structure of military and includes military as well as civilian structures designated for national defence. The term “municipal” in this research stands for municipal institutions responsible for the implementation of the right to self-government.

The informants were selected on the basis of their formal functions that involve disaster preparedness and civil-military cooperation on national or local levels in Lithuania. Additionally, snow-ball technique was used to identify informant highly relevant for this study. Informants from municipalities were selected on this basis. Data saturation was reached after 14 interviews. The characteristics of informants are presented in Table 1. Participation in the interviews was voluntary and responses were anonymised to protect participants’ identities by coding.
Table 1. Characteristics of informants

<table>
<thead>
<tr>
<th>Sector</th>
<th>Number of interviews</th>
<th>Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Representatives of military</td>
<td>2</td>
<td>F1, F2</td>
</tr>
<tr>
<td>Representatives of municipal institutions: persons in managerial positions of municipal administrations</td>
<td>6</td>
<td>S1, S2, S3, S4, S5, S6</td>
</tr>
<tr>
<td>Representatives of municipal institutions: civil servants responsible for disaster preparedness</td>
<td>6</td>
<td>J1, J2, J3, J4, J5, J6</td>
</tr>
</tbody>
</table>

Research instrument. The interview questions were bases on theory (Ankersen, 2008; Bruneau, Croissant, & ed, 2019; Cusumano & Corbe, 2017a; Cusumano & Corbe, 2017b; Madiwale & Virk, 2011; Spence, 2002) and previous research instruments (Cusumano & Corbe, 2017b; Essens, de Vries, Lucius, & Rietjens, 2016; Lee, 2016) on civil-military cooperation in disaster preparedness. A semi-structured interview guide provided main themes and follow-up questions as it is recommended by interview methodologists (Kallio, Pietilä, Johnson, & Kangasniemi, 2016). The main teams explored: what are the cooperating institutions in this field in Lithuania, conditions and forms of municipal-military cooperation in disaster preparedness, advantages and obstacles of this cooperation and finally, opportunities to enhance this type of cooperation in disaster preparedness.

Data collection and analysis. All interviews were audio recorded and transcribed. Data analysis followed standard qualitative methodology: data was coded following main themes and hierarchical framework of sub-themes was developed according to data categorisation. We used data analysis triangulation by combining two methods for the same data set (Renz, Carrington, & Badger, 2018): qualitative text analysis and quantitative method. For qualitative analysis we used conventional content analysis, while for qualitative analysis we counted semantic repetitions.

3. Research findings

3.1. Cooperating institutions

The first thematic area analysed in this study covered institutions that collaborate in disaster preparedness. Legal regulation does not strictly define with whom and how municipalities and military should cooperate in ensuring assigned functions to act in the event of a disaster. Accordingly, the first theme was designed to find out the collaboration aspects of such institutions: (1) municipal institutions (2) military (as it was mentioned in research methodology this term includes institutions of the national defence system).

The informants indicated that municipal institutions are cooperating with many institutions. “We cooperate with anyone that is legally possible and foreseen” (S5). “The municipality probably cooperates with all on demand; it is open to various forms of cooperation” (J5). Informants mainly referred such institutions as the Police, the Fire and Rescue Service and other public sector institutions.

The informants stressed on cooperation with the Armed Forces (4 repetitions). “The Police, the Food and Veterinary Service, the Fire and Rescue Service and the Armed Forces” (S1). “Mostly the Police, the Armed Forces, Hospitals, the Environmental Protection Department” (S2). Individual informants identified cooperation with such institutions of military as the Lithuanian Riflemen’s Union and Mobilisation and Civil Resistance Department under Ministry of National Defence (see Table 2).
Table 2. Institutions and organizations which municipal institutions cooperate

<table>
<thead>
<tr>
<th>Category</th>
<th>Subcategory</th>
<th>Informants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institutions of interior sector and other public sector institutions</td>
<td>Police</td>
<td>S1; S2; S4; J1; J2</td>
</tr>
<tr>
<td></td>
<td>Fire and Rescue Service</td>
<td>S1; S4; J1; J2</td>
</tr>
<tr>
<td></td>
<td>State Food and Veterinary Service</td>
<td>S1; J1</td>
</tr>
<tr>
<td></td>
<td>Environmental Protection Department</td>
<td>S2; J1</td>
</tr>
<tr>
<td></td>
<td>medical institutions</td>
<td>S2; J2</td>
</tr>
<tr>
<td></td>
<td>other public sector institutions</td>
<td>S3; S4; J2; J4</td>
</tr>
<tr>
<td>Military</td>
<td>the Armed Forces</td>
<td>S1; S2; S4; J1</td>
</tr>
<tr>
<td></td>
<td>Lithuanian Riflemen’s Union</td>
<td>S1; J2</td>
</tr>
<tr>
<td></td>
<td>Mobilisation and Civil Resistance Department</td>
<td>S6; J3</td>
</tr>
<tr>
<td>Non-governmental organizations</td>
<td>Lithuanian Red Cross Society</td>
<td>S1; J1</td>
</tr>
<tr>
<td></td>
<td>The Order of Malta</td>
<td>S1; J1</td>
</tr>
<tr>
<td></td>
<td>other non-governmental organizations</td>
<td>S3; S4; J4</td>
</tr>
</tbody>
</table>

Thus, it can be stated that the informants distinguish three institutions of military with which the municipal institutions cooperate. It is stated that the municipal institutions mainly cooperate with the Armed Forces, also have common interests with the Lithuanian Riflemen’s Union and the Mobilisation and Civil Resistance Department under Ministry of National Defence. Other institutions of the Armed Forces were not mentioned.

It is noted that the military representatives provided similar answers. They said that military institutions are cooperating with all sixty municipalities, as well as with non-governmental organizations. The representatives of military stressed that in disaster management it is very important to cooperate with municipal institutions. “On crisis in peace time we are working with non-governmental organizations and all sixty municipalities” (F1). “Cooperation with municipal authorities is important simply because municipalities are responsible for the safety of the citizens” (F2). Cooperation with all ministries and other government bodies was also mentioned (see Table 3).

Table 3. Institutions and organizations which the military cooperate

<table>
<thead>
<tr>
<th>Category</th>
<th>Subcategory</th>
<th>Informants</th>
</tr>
</thead>
<tbody>
<tr>
<td>State institutions</td>
<td>all ministries</td>
<td>F1; F2</td>
</tr>
<tr>
<td></td>
<td>other government bodies</td>
<td>F1; F2</td>
</tr>
<tr>
<td>Municipal institutions</td>
<td>60 municipalities</td>
<td>F1; F2</td>
</tr>
<tr>
<td>Non-governmental organizations</td>
<td>not specified</td>
<td>F1; F2</td>
</tr>
</tbody>
</table>

This data reviles that municipal institutions and military cooperate with a wide range of institutions, from institutions of national and local government to non-governmental organizations. The nature of most existing collaborations confirms theoretical framework (see (Cusumano & Corbe, 2017a; Cusumano & Corbe, 2017b), where civil-military cooperation is emphasized both at national and as well as international level.

3.2. Conditions of cooperation

Further efforts were made to clarify the conditions of cooperation between military and municipal institutions in disaster preparedness. On the bases on the informants’ responses, six key conditions of cooperation were identified (see Table 4). The first condition concerns legal regulation where the exercise of a delegated function is impossible without cooperation (6 repetitions). “The framework for cooperation is regulated by law” (J3). The second distinguished condition of cooperation is the finding of solutions (4 repetitions). “We always find solutions” (S1). “Probably we always try to find a common language. We are constantly exchanging information” (J1). The third condition is that the cooperation maintains a positive relationship (3 repetitions). “This is
the most direct positive relationship” (S1). “I am glad that the cooperation is in progress” (S5). According to the informants’ answers, another distinguished condition is benevolent cooperation (3 repetitions). “So maybe benevolent cooperation. If there is any question, we will boldly turn to each other and decide” (J5). The fifth condition is the mutual benefit of cooperation (2 iterations). “There are benefits for both the municipality and the national defence” (J2). The sixth condition highlighted by the informants is cooperation when needed. “It’s just a matter of asking for help” (S2).

Table 4. The conditions of cooperation between military and municipal institutions

<table>
<thead>
<tr>
<th>Category</th>
<th>Subcategory</th>
<th>Informants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooperation conditions</td>
<td>cooperation by delegated functions</td>
<td>S2; S3; S4; J3; F1; F2</td>
</tr>
<tr>
<td></td>
<td>solutions are always found</td>
<td>S1; J1; F2; S5</td>
</tr>
<tr>
<td></td>
<td>positive relationship</td>
<td>S1; S5; J5</td>
</tr>
<tr>
<td></td>
<td>benevolence</td>
<td>S4; S5; J5</td>
</tr>
<tr>
<td></td>
<td>mutual benefit</td>
<td>S3; J2</td>
</tr>
<tr>
<td></td>
<td>cooperation by needs</td>
<td>S2</td>
</tr>
</tbody>
</table>

Following this data on the conditions of cooperation between military and municipal institutions, it can be stated that cooperation is conditioned by legal acts and defined functions. It can also be argued that cooperation is organized with mutual desire and interest, common solutions finding common solutions and building positive relationships. The identified conditions are generally consistent with those reported by (Spence, 2002), especially those related to environment (most comprising legal environment), and common understanding. The study also revealed the relevance of the intensity of cooperation. The informants’ responses were similar and complementary. Most of them stated that cooperation was continuous (7 repetitions). “Work and information exchange are constantly going on” (J1). “Cooperation should be continuous in preparation for disasters” (S6). Despite the positive aspects of collaboration, some informants stated that there was no intensive close cooperation (2 repetitions). “The scope of cooperation is narrow” (J4). Individual informants expressed the view that cooperation is rare (S2) or that there is no cooperation at all (S4). “We don’t have much ‘business’ together because they have their jobs and we our own” (S2). “It’s like I said we don’t cooperate” (S4). Thus, it can be argued that most of the cooperation takes place on an ongoing basis and that the municipal institutions maintain regular contact with the military. However, there are exceptions, where for some reasons inter-institutional cooperation is rare or non-existent. These different answers could be explained by the fact that although the legal framework of Lithuania (Law of the Republic of Lithuania on the Basics of National Security, 1997; Law of the Republic of Lithuania on the State of Emergency, 2002) provides the preconditions for cooperation between military and municipal institutions in case of disaster, however, more broadly, these provisions are not developed in inter-institutional agreements or disaster preparedness plans.

3.3. Forms of cooperation

One future finding concerns forms of cooperation. There were three forms of cooperation identified used by municipal institutions and military in disaster preparedness: work in the Emergency Management Commission, counselling and joint exercises (see Table 5). Informants in this study highlight collaborative work in natural or man-made emergency management commissions, counselling and seminars, and joint exercises. “Our representatives participate in the Emergency Commission, we conduct joint exercises, exchange information and have consultations” (J4). “Advises on implementation of legislation, and how to ensure national security strategy” (S3). “Cooperation takes place in such directions as seminars, trainings” (F1). “Various joint training, joint exercises, military involvement in community activities” (S5). More specifically, cooperation in disaster preparedness is linked to the plans for emergency response and mobilization that would be deployed in the event of a threat to constitutional order or public peace. Accordingly, informants emphasize the importance of these plans: “Making plans is the key. Preparedness checks are carried out. Training is also underway” (F2). “We combine a variety of plans and possible actions” (S3). According to the informants, there may be cooperation in the exchange of official documents, professionals or information. “Mutual assistance agreements are
being drawn up...mobilization plans are being prepared” (J6). “Collaboration is ongoing through consultations, seminars and exchanging of information by telephone or email” (S6). “There is a constant exchange of information with both the Lithuanian Armed Forces and the National Defence Volunteer Forces” (S1). “Meetings with heads of institutions are organized” (S6). “We have specialists in charge of activities in these fields. These are the representatives. These specialists work with the civil servants of the national defence system” (S3). See Table 5.

Table 5. Forms of military and municipal institutions’ cooperation

<table>
<thead>
<tr>
<th>Category</th>
<th>Subcategory</th>
<th>Informants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forms of cooperation</td>
<td>work on the Emergency Management Commission</td>
<td>S2; S4; J2; J4</td>
</tr>
<tr>
<td></td>
<td>counselling</td>
<td>S3; S6; J1; J4; J5</td>
</tr>
<tr>
<td></td>
<td>joint exercises</td>
<td>S1; S3; S5; S6; F2</td>
</tr>
<tr>
<td></td>
<td>making plans</td>
<td>S1; S3; F1</td>
</tr>
<tr>
<td></td>
<td>training</td>
<td>S3; S5; F1; F2</td>
</tr>
<tr>
<td></td>
<td>work in accordance with official documents</td>
<td>S3; J3; J6</td>
</tr>
<tr>
<td></td>
<td>exchange of information</td>
<td>S6; J1; J2</td>
</tr>
<tr>
<td></td>
<td>work through professionals</td>
<td>S3; S6; F1</td>
</tr>
</tbody>
</table>

In brief, the forms of military and municipal institutions’ cooperation, it can be stated that most of the cooperation time is spent on joint exercises, consulting each other on various issues and working together in the Emergency Management Commission. Also working together on joint plans and training. These findings go in line with previous works on this area. For example, Martínez & Durán (2017) have drawn attention on the importance of civil-military joint training to reach interoperability and shared rules of engagement. The author has analysed the environment of international missions and it can be stated that the results of this study suggest that the forms of cooperation are similar in the national and international context. Thus, there are many forms of cooperation in preparing for disaster response.

3.4. Advantages and obstacles for cooperation

The most common advantage of cooperation is that military and municipal authorities see each other as a source of assistance (see Table 6). Most importantly, institutions have different capacities, the pooling of which is mutually beneficial. As municipal representatives point out, “the armed forces operate quickly, is rich in resources, both human and technical, and can help very quickly” (S2), it will become especially important when “in the event of a disaster, there would be a serious shortage of financial and human resources, so the help would be greatly needed” (J6). Accordingly, it is very important that disaster preparedness would be based on “beautiful cooperation, mutual understanding, close relationships and total work” (S5).

According to the informants, the advantages can be defined as concreteness and benevolence. Informants point out that “the military is very specific. Addressing them gives concrete answers” (J1) and that “the cooperation between us is benevolent. If you need help, call and agree” (J5). As well as the advantages, the informants indicated a good public image and support of integral national defence system. “One of the benefits of military and municipality cooperation is being visible through various cultural events” (J2). As well as the benefits of collaboration was placed on advance planning and always finding a common solution. “We always find solutions through our direct work” (S1). “We can plan in advance what kind of help we may need” (J1). In addition to the advantages to the institutions, the advantage to the State is noted: “main advantage - maintaining a unified defence system” (J3).
Table 6. The advantages of cooperation between military and municipal institutions

<table>
<thead>
<tr>
<th>Category</th>
<th>Subcategory</th>
<th>Informants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advantages of cooperation</td>
<td>source of help</td>
<td>S2; S3; S6; J2; J5; J6; F1</td>
</tr>
<tr>
<td></td>
<td>positive relationship</td>
<td>S1; S3; S5; J5</td>
</tr>
<tr>
<td></td>
<td>advance planning</td>
<td>J1; J6; F1; F2</td>
</tr>
<tr>
<td></td>
<td>concreteness</td>
<td>J1; J4; F2</td>
</tr>
<tr>
<td></td>
<td>benevolence</td>
<td>S5; J2; J5</td>
</tr>
<tr>
<td></td>
<td>good image in society</td>
<td>J2; J4</td>
</tr>
<tr>
<td></td>
<td>supporting of integral national defence system</td>
<td>J3; F1</td>
</tr>
<tr>
<td></td>
<td>always found solution</td>
<td>S1</td>
</tr>
</tbody>
</table>

Not only advantages but also of cooperation need to be identified in order to gain a comprehensive insight into collaborative environment. Legal regulation and bureaucracy were named as the main obstacles for effective inter-institutional cooperation between military and municipal institutions (see Table 7). For example, the informants commented: “the law should clearly regulate who, when, where, at what time is responsible, and what are the limits of responsibility. Now, it is usually the municipal institutions that are responsible for everything” (S5); “some legal provisions do not reflect current reality” (F2); “the obstacle is that we cannot, for example, directly contact the military unit of our city if we need a help. Various documents need to be completed” (J1); “a problem is an excessive compliance with bureaucratic rules. The institutions only deal with their own affairs, which makes it difficult to establish cooperation” (J6). As obstacle for cooperation informants also distinguished hierarchical orders and certificates of secrecy: “if specialists do not receive support from senior management, then it is more difficult for them to anticipate actions, to obtain information from other institutions” (F2). All municipal representatives stressed on lack of access to information: “… military secrets. We would like to know more, but we cannot” (S5); “the obstacle is that we cannot apply directly to any armed forces unit. We turn to the army headquarters and they assign us some forces” (S1).

Informants also pointed out that one of the obstacles is inactivity of employees (2 repetitions). “The major obstacle is probably one. That there are employees who do not pay all their attention, energy, and time to make disaster management plans properly” (F2). Obstacles also include employee rotation, citizen dissatisfaction and problems of coordination of different interests. A very specific example is given by on informant: “Suppose the director of the municipal administration has changed. He has some expertise. The way he mobilized the whole team is where everything starts” (F1). Accordingly, the transfer of knowledge interrupts knowledge transfer and leads to a major information gap.

Table 7. The obstacles of cooperation between military and municipal institutions

<table>
<thead>
<tr>
<th>Category</th>
<th>Subcategory</th>
<th>Informants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obstacles of cooperation</td>
<td>legal regulation</td>
<td>S3; S5; S6; J2; J4; J5; J6; F2</td>
</tr>
<tr>
<td></td>
<td>bureaucracy</td>
<td>S2; S3; S5; J2; J4; J5; J6</td>
</tr>
<tr>
<td></td>
<td>hierarchical system</td>
<td>S1; J1; J5; F2</td>
</tr>
<tr>
<td></td>
<td>military secrecy</td>
<td>S5; J4; J5</td>
</tr>
<tr>
<td></td>
<td>employee inactivity</td>
<td>J1; F2</td>
</tr>
<tr>
<td></td>
<td>staff rotation</td>
<td>F1</td>
</tr>
<tr>
<td></td>
<td>citizen dissatisfaction</td>
<td>J2</td>
</tr>
<tr>
<td></td>
<td>different interests</td>
<td>S2</td>
</tr>
</tbody>
</table>

Thus, the data of the study show that both municipal institutions and the military are aware of the benefits and obstacles of inter-institutional cooperation, that are named in the previous research (Kaneberg et al., 2016; Madiwale & Virk, 2011; Vangen, 2017). The main advantages are mutual assistance and comprehensive understanding of the value of integrity in the face of risks of disaster. It goes in line with previous studies form other fields of cooperation where support and information sharing is perceived as mutual enrichment (see Zeibote, Volkova et al. (2019).
Meantime, the obstacles for cooperation are strict legal regulation and the military bureaucracy. This results not only in the inaccessibility of important information but also in creating distrust between the parties involved.

3.5. Opportunities to enhance cooperation

There are several opportunities to enhance cooperation between municipal institutions and military in disaster preparedness. Following the informants, seven ways to improve inter-institutional cooperation were identified (see Table 8). The first is legislative change or simplification (6 repetitions). According to the informants, “we would like to have a normal, long-term, reasonably crafted legislative framework” (S5), that would allow more flexibility, for example, “either they need to be simplified somehow or some instructions need to be put in place so that, in the event of a disaster, the military squad could be used just with the order of the battalion commander” (S2). Also, to improve inter-institutional cooperation an access to restricted information should be reviewed (3 replications). The second, informants suggest that comprehensive planning may improve inter-institutional cooperation in disaster management. Nevertheless, bodies that carry out the tasks and actions are identified in the plans, more detailed planning is needed as “detailed steps of collaboration” (S3). The informants also suggested improving the cooperation by implementing joint disaster management (2 replicates). The informant suggests imagining the following situation: “Now, in one area did the disaster strike and institutions of that area have a problem. Resources become channelled so that the consequences can be eliminated as quickly as possible” (J5). For this or similar cases detailed planning and cooperation agreements would help to solve the problems more effectively. The third opportunity to enhance cooperation lies in joint training and exercising as well as learning at the seminars to ensure the dissemination of information and to build a trust between institutions. As an informant points out, “mutual understanding and joint problem solving are essential” (J6).

<table>
<thead>
<tr>
<th>Category</th>
<th>Subcategory</th>
<th>Informants</th>
</tr>
</thead>
<tbody>
<tr>
<td>The factors of cooperation improvement</td>
<td>modification / simplification of legislation</td>
<td>S2; S5; J2; J3; J4; J5; J6</td>
</tr>
<tr>
<td></td>
<td>detailed planning</td>
<td>S1; S3; S6; F1; F2</td>
</tr>
<tr>
<td></td>
<td>grant access to documents that are not publicly accessible</td>
<td>S5; J4; J5</td>
</tr>
<tr>
<td></td>
<td>joint disaster management</td>
<td>S6; J5; F1</td>
</tr>
<tr>
<td></td>
<td>conducting of seminars, training and exercises</td>
<td>F1; F2</td>
</tr>
<tr>
<td></td>
<td>information dissemination</td>
<td>F1; F2</td>
</tr>
<tr>
<td></td>
<td>mutual trust</td>
<td>S6; J6</td>
</tr>
</tbody>
</table>

Here, simplification of key existing legislation may improve civil (municipal)-military cooperation in disaster preparedness. It basically confirms the statements of researches (Jimenez Aguilar & Thoene, 2019; Kaneberg et al., 2016; Kuprijanova et al., 2018) who emphasize the importance of proper legal regulation. Two other ways to improve inter-institutional cooperation are related to information sharing in detailed planning process and information sharing during joint exercises and other activities. With regard to the effect of information sharing, Kalkman & de Waard (2017) note that lack of information creates uncertainties about what potential partners will do, as well as creates mistrust. Very similar insights are provided in the studies of very different types of cooperation in civil sector (Bublienė, Vinogradova, Tvaronavičienė, & Monni, 2019; Prause, 2015) To sum up, information sharing creates mutual trust which is highly important for effective disaster preparedness.

4. Conclusions

The results presented in the article show that the cooperation between municipal institutions and military personnel of the same nations is similar to that of civilians and soldiers in international missions or disaster relief: cooperation; mutual understanding of the value of cooperation; willingness to cooperate and mutual support. At the same time, there are objective obstacles to the effectiveness of cooperation in disaster preparedness. These barriers are linked to the ineffective exchange of information, leading to the rigidity of the entire disaster management system.
This research did reveal that military as well as municipal institutions identify each other as a partner among other institutions they cooperate with in disaster preparedness. However, cooperation does not come from an internal initiative. More specifically, cooperation is conditioned by legal acts and legally defined functions. Mutual benefit is also perceived, but it is a secondary factor in communication. Both sides agree that working together creates mutual benefits where there are common interests, common solutions and positive relationships. There are some interesting findings related to intersection of legal requirements and mutually indicated cooperation. Cases when inter-institutional co-operation is not strictly regulated by the legal framework, co-operation can by extended and long-lasting or fragmented and rare. It depends on whether the parties find common understanding and have a comprehensive approach. This can be explained by the paradox of inter-institutional cooperation, where cooperation between diverse institutions cause challenges and, at the same time, creates synergy. Depending on which attitude (challenge or synergy) the parties follow, intensity of cooperation depends.

One further finding related to the forms of civil (municipal)-military cooperation in disaster preparedness. Just as disasters are diverse, forms of cooperation in preparing for disaster response are diverse likewise. In preparation for threats to national security, where are guided by the military concept, the cooperating parties use their knowledge and experience in the emergency management where civilian attitudes and civilian governance paradigms are used.

Evidence suggests that while cooperating municipalities and military face with favourable as well as with interfering conditions for cooperation in disaster preparedness. Mutual assistance and exchange of information, positive relations and benevolence are faced with bureaucracy, hierarchical systems and inaccessibility of information due to military security. These features are leveraging civil (municipal)-military cooperation in disaster preparedness. Thus, the main way to improve cooperation is to simplify the legal framework for cooperation and introduce certain exceptions.

Thus, this study explored some of the issues of civil (municipal) and military cooperation in disaster preparedness. The findings demonstrate the existence of a mutual understanding of the value of such cooperation. However, cooperation at this level has a number of limitations, the removal of which would allow for better disaster preparedness and disaster response.

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ISSUES OF PUBLIC SECURITY: LEGAL CONSEQUENCES OF DETERMINING UNFORESEEABLE EXTRAORDINARY EVENTS

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Abstract. The basis of every state is in its democratic system and ability to defend it. Therefore, a government has legal rights to immediately declare emergency situation, responding to crisis, catastrophes or unforeseen extraordinary events. The topicality of the research is determined by the emergency situation declared by the Cabinet of Ministers in 2019 in the administrative territory of Riga City in regard to waste management, in order to provide the Riga municipality with an opportunity to conclude negotiated procedure without prior publication. Even though state’s democratic system demands to act immediately in any case of such action, it must be legal since the public, whose life, health and property might be endangered, relies on it, as well as budget is spent on it. However, the mutual application of regulatory enactments in practise cause issues because it is not always clear how to identify and separate such situations and which regulatory enactment is applicable in each specific case. The aim of the research is to determine what is included in the definition of unforeseeable extraordinary events in the context of public procurement, when the government has rights to declare an emergency situation, what are the legal consequences of declaring emergency situation and provide suggestions for dealing with the issue highlighted by the research. In order to reach the set goal, the following tasks were defined: carry-out analysis of regulatory enactments, research the judicature of the European Union and Latvia, conclusions of legal scholars and evaluate the practice of legal act application. The research utilizes descriptive, comparative, dogmatic, historical, systemic, teleological method and analytical interpretation of regulatory enactments.

Keywords: public procurement; unforeseeable extraordinary events; emergency situation.


JEL Classifications: K 100, H570, H830.

Additional disciplines: law; economics.

1. Introduction

The guarantor of the sustainable development of the state is a stably safe society and its economy. Over the past few years, public safety issues in various problemic areas have already been addressed by many scientists (e.g. Tumalavičius et al. 2016; Tumalavičius, 2017; Kuril, 2018; Bernardi, 2019; Reinhold et al., 2019; Vigliarolo, 2020; Chehabedidine, Taronavičienė, 2020).
Decision-making issues by state institutions in emergency situations have not been studied and require a deeper analysis and study.

Situations that are not foreseeable but require immediate action often arise in public administration. That means that, for state administration continuity purposes, clear and unambiguous lawful basis that would allow making a lawfully based decision as soon as possible is necessary. In regulatory enactments and practice these situations are referred as extraordinary events, emergency situations or crises, and often they are emphasized as unforeseeable. From a decision-maker it requires not only the ability to correctly identify each such case, but also immediate legal action and consequence liquidation.

The topicality of the research is determined by the Cabinet of Ministers (hereafter – CM) order No: 432 on September 12, 2019 which declared an emergency situation for 3 months in the administrative territory of Riga City and Riga municipality was ordered to conclude the negotiated procedure in accordance specified by the Public Procurement Law (hereafter – PPL), coordinating tenderer requirements (technical specifications) and the results of the negotiated procedure with the Ministry of the Environmental Protection and Regional Development (hereafter – MEPRD).

2. Public Procurement Law

Public Procurement is a process which results in a signed procurement contract. In accordance with PPL, it is a public construction work, supply, or service contract for pecuniary interest concluded in writing between one or several contracting authorities and one or several economic operators (PPL, 2016: 1). Public procurement has six procurement procedures, including negotiated procedure, which is a procurement procedure where the contracting authority without prior publication of the contract notice, consults with the economic operators selected by it and organises negotiation with one or several of them regarding the conditions of the procurement contract (PPL, 2016: 1). One of such cases when the contracting authority can apply negotiated procedure is due to unforeseeable extraordinary events (PPL, 2016: 8).

PPL Article 8, Paragraph seven, Point three determines that the contracting authority has rights to apply negotiated procedure if as a result of extraordinary events unforeseeable by the contracting authority, a situation has objectively occurred, where, for reasons of urgency, it is not possible to apply an open procedure, a restricted procedure or a competitive procedure with negotiation. The above-mentioned circumstances which justify extraordinary situation may not depend upon the activities of the contracting authority. According to PPL Article 60, Paragraph nine, Point three states that a procurement contract may be concluded immediately without complying with Paragraph six of this Article, meaning without the waiting period, during which a tendered whose rights have been violated might submit a complaint regarding infringements of the procurement procedure to the Procurement Monitoring Bureau (hereafter – PMB), if the negotiated procedure is being applied.

Recital 50 of the Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on public procurement and repealing Directive 2004/18/EC (hereafter – Directive) emphasizes that in view of the detrimental effects on competition, negotiated procedures without prior publication of a contract notice should be used only in very exceptional circumstances. Article 18 of that Directive underlines that the procurement shall not be made with the intention of excluding it from the scope of that Directive or of artificially narrowing competition. That directive provides a possibility for the Member States to determine that contracting authorities may award public contracts by a negotiated procedure without prior publication in so far as is strictly necessary where, for reasons of extreme urgency brought about by events unforeseeable by the contracting authority, the time limits for the open or restricted procedures or competitive procedures with negotiation cannot be complied with. The circumstances invoked to justify extreme urgency shall not in any event be attributable to the contracting authority (Directive, 2014:32). According to Recital 109 of that Directive, the notion of unforeseeable circumstances refers to circumstances that could not have been predicted despite reasonably diligent preparation of the initial award by the contracting authority.
Court of Justice of the European Union (hereafter – CJEU) has recognized the contracting entity’s rights to use negotiated procedure without prior publication of contract notice if for the reasons of extreme urgency brought about by events unforeseeable by the contracting entities, the time limits laid down for open and restricted procedures cannot be adhered to. The case-law has made it subject to three cumulative conditions, namely an unforeseeable event, extreme urgency rendering impossible the observance of the time limits laid down for calls for tenders, and a causal link between the unforeseeable event and the extreme urgency resulting therefrom (CJEU Nr. C–394/02, 2005: 40). As derogations from the rules relating to procedures for the award of public procurement contracts, the provisions must be interpreted strictly. Also, the burden of proof lies on the party seeking to rely on them (CJEU Nr. C–394/02, 2005: 33). Identical conclusions have been expressed in the CJEU judgement in case No. C–126/03 paragraph 23 and in 20/06/2013 judgement in case No. C–352/12 paragraph 52.

Urgency alone in the view of Republic of Latvia (hereafter – LR) Supreme Court (hereafter – SC) does not justify carrying out negotiated procedure without prior publication of contract notice because it is additionally necessary to establish that the situation has been caused by extraordinary events unforeseeable by the contracting authority that do not depend on it. SC points out that unforeseeable events may be events that cannot be objectively foreseen with due diligence. Consecutively, extraordinary events are such events which do not correspond to the normal order (SC No. SKA–426/2018, 2018: 14).

The authors point out that legal scholars (Telles, Butler 2014: 3.2.1) emphasize certain freedom of action and subjectivity by contracting authority’s when assessing the criteria for the existence of extraordinary events. In addition, evaluating CJEU case law, it is noted that urgency can be determined on the basis of objective evidence, and that an event that creates urgency cannot be foreseeable and cannot be attributed to the contracting authority’s own conduct (Arrowsmith, 2014: 1075). Scholars also point to the role of the CJEU in the evolution of European Union (EU) public procurement legislation (Bovis, 2012: 2).

When explaining the notion of unforeseeable extraordinary events, the PMB refers to circumstances which go beyond the normal economic and social situation (such as an accident or natural disaster) and there is an immediate necessity to procure to deal with the consequences of the unforeseeable extraordinary events. The negotiated procedure applies to purchase of goods, services or construction works to an extent that is strictly necessary to prevent an emergency.

The authors conclude that the long-standing operation of the EU legal norms in public procurement area, CJEU and LR case law, as well as PMB explanations have creates legally understandable and applicable notion of extraordinary urgency. Urgency, in the authors’ opinion, is characterized by a time constraint on the conduct of procurement procedures which logically means that the contracting authority needs the services or goods immediately. Furthermore, Article 32 of the Directive emphasizes the circumstance of extreme urgency, highlighting a state of exception– extreme urgency not urgency that leads different legal consequences. Therefore, the authors agree with the opinion of other researchers that is important to differentiate urgency from extreme urgency and justify it accordingly (Telles, Butler 2014: 3.2.1). The authors stress that the aforementioned circumstances have to require immediate actions. Although, undeniably, in evaluating the circumstances the contracting authority has freedom of action, both case law and studies have accentuated the existence of causal link, which means a link between cause and consequences, namely, harmful consequences that could occur without an adequate reaction from state administration to an extraordinary circumstances or event. The SC does not recognize circumstances that were dependent on the contracting authority as urgent, for example, not timely preparation of procurement or neglect of possible appeal in procurement. The authors underline that urgency in itself is not the basis for negotiated procedure since in applying negotiated procedure intended by PPL Article 8, Paragraph seven, Point three, there need to be a circumstance or event that objectively was not foreseeable, that is, goes beyond the normal and social situation (e.g. natural disaster). It is possible to agree with the opinion expressed by other researchers (Surmovičs, 2013) that this exceptional procedure can only be utilised to prevent the consequences of extraordinary and unforeseeable events and the urgency and unpredictability of these cannot be supposed, in particular, the contracting authority cannot be held liable for their occurrence, thus
excluding the possibility of unduly applying the negotiated procedure. In the authors’ view, it means that it is essential to objectively state, firstly, unforeseeable event or situation, which has not occurred as a result of an action or omission of an action by the contracting authority, secondly, extreme urgency, namely, immediate action to prevent a threat to public interest, thirdly, causal link between unforeseeable event and extreme urgency. Without even one of these circumstances, there is no legal basis to apply negotiated procedure without prior publication.

At the same time, the authors emphasize that when purchasing a service or a good to prevent unforeseeable extraordinary situation, the contracting authority’s actions are not unlimited because the procurement is limited in volume, namely, only to prevent an emergency situation and cannot go beyond the volume that is necessary to deal with an emergency situation. That follows from Article 32 of the Directive where it is stated that procedure can be applied only to the extent that is strictly necessary. It is understandable that in case of such situation in it impossible to predict or forecast the volume. Nevertheless, the authors believe that technical specifications of goods, services or construction works and contract deadlines might indicate that the procurement is for other purposes, for example, for one year which has no relation to extreme urgency circumstances, for instance, daily road maintenance.

Even though PPL and CM Regulation No. 107 “Tendering Procedures for Procurement Procedures and Design Contests” describes the contracting authority’s actions in case of negotiated tendering procedure (CM No.107, 2017: 2.6.), the authors, studying the issue purchasing goods or services or mobilizing material resources in response to disasters or similar situations to prevent hazards, that it is not only possible under the PPL but also under other legal frameworks.

3. Legal aspects of resource involvement in the event of a disaster

According to Civil Protection and Disaster Management Law (hereafter – CPL) Article 1, disaster is an accident which has caused human casualties or endangers human life or health, caused damage or threat to people, the environment or property, and also inflicted or inflicts significant material and financial losses and exceeds the daily capacity of the responsible State and local government authorities to prevent the devastating conditions. Article 4 of this law defines man-made disasters or anthropogenic disasters as technogenic disasters caused by a release of chemical, radioactive and biological substances, fires in buildings and structures, explosions, ruptures in dams and other hydrotechnic structures, damages to energy networks, accidents in utility networks, collapse of buildings and structures or vehicle accidents. Local disasters are such disasters where the scale of damage caused by a disaster does not exceed the borders of the administrative territory of one local government. Disaster response measures consists of a set of the measures which are performed in order to reduce or eliminate devastating conditions and the consequences caused thereby, to prevent or reduce harm to people, the environment and property, while measures for the elimination of consequences are a set of measures which are performed in order to ensure at least the minimum basic needs of inhabitants related to the survival of people and to stop or reduce threat to human health, the environment and property. Response measures and measures for the elimination of consequences include also rescue operation, as well as CPL provides the possibility to involve legal and natural persons, and also resources at their disposal in response and elimination of consequences measures (CPL, 2016).

In order to stop and prevent extension of fire and dangerous factors related thereto which endanger natural persons, material valuables and the environment, or to liquidate obstacles, which hinder fire-fighting and the performance of rescue operations, the manager of fire-fighting and rescue operations is entitled to with the consent of owners (authors’ underlining) use movable or immovable property of natural and legal persons in the performance of operations (Fire Safety and Fire-fighting Law, 2001: 15, 20).

CM Regulation 07/03/2017 No. 131 “Regulations Regarding the Involvement of the Resources of Legal or Natural Persons in Response and Elimination of Consequences Measures or Fire-fighting or Rescue Operations and Procedures for the Calculation of Compensation for the Incurred Expenditures and Losses” determine that
the operations manager and the resource owner (possessor) shall enter into a written agreement (authors’ underlining) on the involvement of resources at the place of the incident; however, if not possible, within a period of five working days after the involvement of the resources in the relevant measure. The consequences of this agreement is that the resource owner (possessor) has the right to be compensated in full amount for the actual expenditures and losses incurred as a result of involving resources in the operations, but the lost profits shall not be compensated (CM Regulation No.131, 2017: 6).

The authors view that disaster definition and actions are determined by two crucial criteria:
1) consequences of the event or their probability – human casualties, endangerment of human life or health, caused damage or threat to the environment or property;
2) the event surpasses the responsible state’s or local government’s institutions ability to deal with the hazardous circumstances. Undeniably, natural or man-made disasters can endanger not only the environment, property, but also, most importantly, public health and life. Due to these circumstances, state rescue services have to act immediately with adequate resources to respond accordingly, perform rescue operations, eliminate consequence, specifically, remove hazard to human life and health, the environment, as well as protect their properties. Taking into account the definition of a disaster, it is possible to conclude that it goes beyond the regular capacity of various state services to respond to the scale and intensity of resources required, thus the state services need to use the property available to private persons in such situations.

In authors’ opinion, it is highly important to stress the time aspect, that is, the time period from the event that surpasses the regular capacity of various state services to eliminate hazards or ability to predict and forecast resources, till the response measures. As opposed to the time aspect, namely, urgency, it is essential to note that the previously discusses regulatory enactments of disaster management demand that resources be involved on the basis of a written agreement, which is the basis for a compensation.

Parliamentary investigation commission’s gave a final report on state’s actions, evaluating the causes of a tragedy that occurred in Zolitude on November 21, 2013, and further measures taken to improve regulatory enactments and the work of state and local government administration in order to prevent re-occurrence of such tragedy in the future, as well as measures for elimination of consequences. The final report stated that on November 21, 2013 in Riga, Zolitude a building collapsed, leading to 54 human casualties, and concluded that rescue operations involved no only the human resources available to the state and local government, but also involved material and technical equipment at the disposal of private contractors. Thus it is clear what special equipment urgently needs to be purchased for rescuers to improve their work in the event of a possible tragedy (Saeima, 2015).

On April 29, 2014 CM issued order No.186 in order to compensate expenditures that occurred from involving private person resources in rescue operations. Total expenditure reached 101 713 euro. The annotation of this order notes, that basing on the CM regulation, an agreement was closed, private contractors’ requests was reviewed and decision prepared in order to compensate the expenditures and losses due to their resources involved in response measures (The Ministry of the Interior, 2014).

The authors conclude that the previously mentioned example shows a contradiction between a necessity for an urgent action in an emergency situation and the fact that involving required resources to eliminate endangerment depends on the resource owner’s (possessor’s) consent and written agreement upon that. At the same time, the authors believe that in situations with in identical circumstances – unforeseeable, not attributable to the contracting authority’s actions, which objectively demands urgent action, form into two legally different ones, namely, according to PPL Article 8, Paragraph 3, Point seven organized negotiated procedure and according to CPL Article 6, Paragraph four intended involvement of resources in the basis of a written agreement. In both cases, therefore, the good, service or construction works are provided for compensation in the form of written agreement. It means that, on the one hand, there is a freedom of action, and, on the other hand, there is a legal uncertainty since there are no clear criteria that would allow separating these cases.
4. Declaring emergency situation

National security concept approved by the Parliament emphasizes that state’s constitutional apparatus is part from the notion of internal security which is closely associated with the base values determined by the Constitution of the Republic of Latvia: national independence, democracy and territorial integrity (CM 2019, 7). National security concept notes that it is necessary to strengthen and develop civil protection system, civil-military cooperation, ensuring interinstitutional action and resource utilization in a case of a national threat (Saeima, 2015, 4.1).

Emergency situation is a special legal regime, during which the CM has the right to restrict the rights and freedoms of State administrative and local government institutions, natural persons and legal persons, as well as to impose additional duties to them. Emergency situation shall be declared by the CM for a definite time period, but no more than three months. Emergency situation may be declared in case of such threat to national security, which is related to a disaster, danger thereof or threat to the critical infrastructure, if safety of the State, society, environment, economic activity or health and life of human beings is significantly endangered (Saeima, 2013: 4,5).

Law “On Emergency Situation and State of Exception” (hereafter – ESL) Article 8, Paragraph one, Points three and four state that in declaring emergency situation, the CM has the right to stipulate procedures for economic activity or restrictions to such activity; access to goods, medicinal products, energy resources, services and other material and technical resources (Saeima, 2013: 8). It has to be noted that applying the norms of this law does not limit other laws as far as they are not in contradiction with order stated by this law and legally determined special procedures to prevent emergency situation or state of exception (Ministru kabinets, 2012). Emergency situation is a special legal regime that is mainly attributable to civil (non-military) crises. One of the authors of this law security policy expert Kaspars Druvaskalns explains that in practice it could be mostly refer to natural disasters (for instance, storms, whirlwinds, earthquakes, torrential rains, floods, hail, heavy frost, snow storms, icing, snowfall and ice congestion, heat, drought, forest and peat bog fires), man-made disasters (such as industrial accidents with chemical, radioactive and biologically active material leaks, building fires, explosions, vehicle accidents, dam breaks, utilities and energy service breaks, building collapses, public disorder and terror), as well as dangerous mass people, animal and plant diseases (Laganovskis, 2013).

For instance, CM issued order No.4 On declaration of the emergency situation (Ministru kabinets, 2011). This order determined in accordance with PPL Article 3 Paragraph three point 2 not to apply the relevant public procurement legislation, if their application could create harm to protecting national interest, and essential protection of national interests is decided by the CM (CM 2011: 7). Similarly, somewhat controversial situation appeared in Riga City related to waste management after Competition Council (hereafter – CC) had suspended the implementation of the waste collection concession contract for a period of 20 years (CC 2019).

The CM decided to declare an emergency situation in the administrative territory of Riga City starting from 11/09/2019 until the moment when the decision of the Competition Council No. 19 “On interim measures” is no longer in force, but not longer than 11/12/2019 with the aim to secure the continuity of waste collection and disposal in the administrative territory of Riga City without increasing administrative or financial burden waste generators or governors during an emergency situation. To ensure the aforementioned, Riga Council was ordered to immediately apply and till 13/09/2019 conclude negotiated procedure according to PPL, coordinating tenderer requirements (technical specifications) and the results of the negotiated procedure with the MEPRD (Ministru kabinets, 2019: 3.3., 3.5.). The order was justified with Article 4 Paragraph 2 Point two and Paragraph 2 Point one of CPL, Article 4, 5, 6, 8 of ESL, to prevent threat of anthropogenic disaster that is associated with potential environmental and public health hazards.

According to the annotation of this order, emergency situation was necessary to prevent threat of anthropogenic disaster that is associated with potential environmental and public health hazards if starting from 15/09/2019 waste collection and disposal would be suspended or seriously hindered in the administrative territory of Riga
City, the basis of which serves the decision on 09/09/2019 No.19 with which Riga City municipality and SIA “Getlini” have the obligation to immediately stop 14/06/2019 the execution of concession contract “On implementation of Riga City waste management system” starting from agreement date in part which refers to non-recycled and separated waste collection and transportation (MEPRD, 2019: 2).

The Supreme Court points out that the Competition Council is the only competent institution in the system of state administration system, agreed by the market supervision, ensuring free market principles are abided by. The circumstance that one of the market participants operational aspects has been transferred to other state administration institution competence, does not limit Competition Council’s competence because each state administration institution exercise competence in its own field (SC 2016: 8). The Court stresses that the main manifestation of the principle state administration’s unity id that all state administration institutions are organized in united hierarchical system and it must be adhered to that each institutions duty is to work within its area of competence (SC 2016: 14).

Evaluation declaring emergency situation in Riga, the authors conclude that it has been declared on the basis of probability of an event, namely, not collecting and disposing waste, which could be due to legally taken decision of a state administration institution, because at the moment of the order the only factual circumstances was local government’s concession contract and Competition Council’s decision to suspend it. Analysing legal consequences, the authors highlight that the only aim to declare emergency situation was to secure the process of negotiated procedure without prior publication of contract notice. In authors’ view, it means that the consequences of declaration of emergency situation are to restrict free competition and economic activity because negotiated procedure allows immediate signing of an agreement with a specific contractor.

In the authors’ opinion, it is important to evaluate if the decision complies with the Constitution of the Republic of Latvia. Section 105 of the Constitution determines that everyone has the right to own property and property rights may be restricted only in accordance with law. The authors point out that Constitutional Court has recognized that a person’s economic interest that is related to commercial activity is included in the first sentence of the Constitution’s Section 105 (Constitutional court 2014: 10.1). From the mentioned it can be said that it is necessary to determine whether restriction of such free economic activity and competition has been properly followed.

As noted by legal scholar K. Balodis, such regulatory enactment has to be issued, basing on law, published or otherwise available and clearly formulated in order for the addressee could understand her rights and duties, as well it has to comply with the rule of law. In turn, law has to clearly state competent institution’s authority and how to exercise it, taking into account legitimate aim of the instrument to provide protection to an individual from arbitrary interference (Balodis, 2011: 471).

This view is based on the Constitutional Court’s recognition that in order to assess whether a restriction of a fundamental right has been established by law, it needs to be verified that the law is clearly enough formulated so that a person could understand the substance of the rights and duties arising therefrom and could predict the consequences of application (Constitutional court Nr.2015-01-01: 14).

The authors draw attention to the fact that the commission of Constitutional rights has already expressed opinion that inclusion of separate section in the Constitution on human right restriction in a case of war, state of exception and emergency situation should be seriously considered (Levits et al, 2011: 191). In addition, it is emphasized that Section 90 of the Constitution affirms predictability, clarity and understandability of legal norms, thus clearly ambiguous and in complex words stated norm cannot be attributed to a private person in a manner which would impose obligations, restrictions on rights or sanctions of a punitive nature.

The Treaty on the Functioning of the European Union Article 3, Part one, point b states that it has competence in establishing of the competition rules necessary for the functioning of the internal market (LESD, 2012:3). Thus, in the authors’ view, ensuring competition is an important part of international commitments that Lat-
via has taken upon by joining the EU, simultaneously transferring the creation of necessary regulation in the Union’s competence. In turn, it is closely related with public procurement whose regulation is included in the Directive and taken over in PPL with one of the aims being free competition of tenderers (PPL Section 2). The CM by declaring emergency situation and ordering different procurement procedures than stated in the PPL, give basis to a conclusion that international commitments are being ignored are in contradiction with the goals of the PPL. Additionally, the authors believe that there is foundation to claim that, by restricting competition, normal commercial activity is disrupted which might be considered as violation of the Constitution’s Section 105, which can occur in the order defined in the Constitution’s Section 116 and on a basis of a clearly formulated law.

Assessing the included government’s rights to determine special order of economic activity or its restriction in Emergency situation law Article 8, Paragraph one, Point three, the authors believe that they are formulated unclearly and too generally to give basis to restrict competition that would manifesting in establishing a different order that stated by the relevant law, that is, PPL.

Conclusions and recommendations

Decisions taken by the state administration institutions within their competence are not recognized as unforeseeable extraordinary events in public procurement.

PPL Article 8, Paragraph three, Point seven given justification is a permanent legal notion and does not include in itself declaring emergency situation on the basis of Emergency situation law. In order to apply negotiated procedure, it is necessary to state legal justification specified by PPL and declaring emergency situation does not in itself include rights to determine different procurement procedures.

In the event of a disaster, extreme urgency is the reason to procure goods and services both guided by PPL norms and Emergency situation law because in both cases there is an identical legal justification and consequences, as well as agreement is needed.

In order to perform response measures in the event of a disaster, respective regulatory enactments intend written agreement with the resource owner (possessor) and it creates a significant risk not to acquire the resources in the necessary time and volume.

Additional in-depth research is need about the possibility of resource inclusion for disaster management without owner’s agreement.

Additional research is needed to specify the notion of “special procedures for economic activity” law “On Emergency Situation and State of Exception” Section 8, Paragraph one, Point three, establishing clearly criteria and government’s authority understandable to everyone.

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The Journal of Security and Sustainability Issues considers all manuscripts on the strict condition that they have been submitted only to it; that they neither have been published yet, nor they are under consideration for publication or in press elsewhere. It should be clearly indicated if a submission was previously declined by another journal. Authors who fail to adhere to this condition will be charged with all costs which the Journal of Security and Sustainability Issues incurs and their paper will not be published.

Contributions to the Journal of Security and Sustainability Issues must report original research and will be subject to peer-review.

General Information

All papers are to be written in English. The Journal of Security and Sustainability Issues is an internationally refereed journal designed to further the frontiers of knowledge in security and sustainability. Each article is reviewed by at least two experts, appointed by the Editorial Board, who will examine the manuscript through a double-blind refereeing process in terms of its relevance, academic rigor and high level applications. An electronic copy prepared in MS Word and printed in Times New Roman typeface should be submitted to the Editorial Board following the requirements presented below.

Structure of the Article

An article should include the following parts: title, authors’ names, name and address of their work place, summary, keywords, introduction (the object and goal of the research, the methods applied, the review of literature and its analysis, etc.), the main text, conclusions or recommendations, references, short biographical note about the contributors at the end of the article (name, surname, academic title and scientific degree, duties, research interests).

Format of the Article

The text of the article should be printed with single intervals on 210x297 mm format pages with the print area of 150x255 mm each. The length of the article should not be less than 8 pages and cannot exceed 25 pages.

The title of the article should be printed in 11 pt bold type and should be centered. There should be a single line space between the title and the author’s name.

The name and surname of the authors should be printed in small letters of 11 pt bold type and should be centred. Below the author’s surname, the name of the institution (represented by the author or co-authors) must be printed in 10 pt italic; its address and the author’s e-mail written and centred.

Abstract and Keywords should be printed single spaced, in 9 pt typeface, in one column and after the institution address and space of three lines below the institution address should be left. Words Abstract and Keywords must be printed in bold. The size of the abstract cannot be less than 600 typographic signs. There should be a space of one line between the abstract and keywords. 6-10 keywords should be provided and selected according to Thesaurus, e.g. http://www.esds.ac.uk/search/hassetSearch.asp.

Introduction, main text and conclusions should be printed in 11 pt type single interval in one column at the distance of 1 line from keywords.

Figures or tables should be mentioned in the text and the place should be indicated in the separate line. The numbers of figures and tables and inscriptions below are written in 9 pt regular typeface. Figures and tables are separated from the text by one-line space.

The titles of chapters and sub-chapters are printed in small letters, 11 pt bold-regular type and aligned left. The introduction, titles of chapters and conclusions are numbered. The titles of chapters and sub-chapters should be separated from the text by one-line space.

The name of the author of the source, the year of publication and pages should be presented in the text in brackets. The list of references is given after the conclusions. The word References is spelled in small letters, 11 pt bold-regular type, left ranged and the list of references in 9 pt. The references are to be presented in the alphabetical order, in the original language; translation into English is given in square brackets. References according to the Harvard citation style, e.g. http://libguides.library.uwa.edu.au/harvard.
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