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REGIONAL CONFLICTS AS AN ATTRIBUTE OF GLOBAL INSTABILITY

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Abstract. The article presents the nature of regional conflicts as one of the types of social conflicts in the context of traditional (naturalistic) and activity approaches. The authors reveal a number of conditions that determined the reasons for use of social conflicts in the second half of the 20th century, as well as the features of the increased demand for them in terms of solving the problems generated by contemporary globalization processes. Particular attention is paid to the threat posed by the attempts of a number of countries to use regional conflicts in order to demonstrate their power to the rest of the world. The article presents the analysis of the reasons contributing to the transformation of regional conflicts into an attribute of global instability, as well as considers the prospects of the formation of a multipolar world arrangement model, where the very possibility of regional conflicts could be minimized.

Keywords: regional conflict; the activity approach; conflictogenity; the conflict escalation; counteractivity; the subject-object paradigm; destabilization; uncontrollable chaos


JEL Classifications: H55, O18, P48.

Additional disciplines: political sciences; sociology

1. Introduction

Today, globalization processes are increasingly demonstrating trends that indicate the emergence of global instability. The dynamics of these processes acquire a pronounced turbulent nature. In addition, against this background, the increased number of terrorist acts, carried out by members of various extremist groups and international terrorist organizations, has become a special threat to world. Their danger is greatly exacerbated by the fact that these actions are associated with a pronounced religious dominant. In this regard, the identification of the reasons for such a rapidly growing tendency to solve problems arising in society in the most radical way is not only purely theoretical issue, but also the problem of great practical importance. The acquired knowledge can be particularly relevant in connection with the response to the provocations and threats that today are represented by conflicts of a regional format.

In this regard, quite indicative is the attitude to the events of this kind, manifested, for example, in the Republic of Kazakhstan. Attention to them, both from the part of state and the professional community of philosophers, sociologists, psychologists, political scientists, and public members appears when they are already beginning to take a resonant nature. A clear proof of this fact, for example, can serve the conflict in Western Kazakhstan, which occurred in 2011 in Zhanaozen (Conflict in Western Kazakhstan, 2012) and the conflictogenic nature of the events that took place in the city of Temirtau of the Karaganda Region (Conflict in Temirtau: Chronic
stage, 2012). Particularly alarming is the fact that “in the period from 2011 to 2016 in Kazakhstan, according to publicly available sources, there were more than 10 major terrorist acts” (Kasymov, 2018).

Western scientists have comprehensively studied the conditions, causes, and factors of social conflicts, their specifics, development stages, and functions in society. On this basis they have developed various conflict typologies. The following concepts have become particularly popular: “The general theory of conflict” (K. Boulding), “The positive-functional conflict” (L. Coser), “The conflict model of society” (R. Dahrendorf), “The international conflict as a special kind of social conflict” (K. Deutsch, K. Mitchell, B. Brody, R. Patnem, M. Hermann), and “The theory of fundamental negotiations” (G. Burton, R. Dahl, R. Fisher).

The problem of regional conflicts is extremely diverse, since they differ in forms, causes, etc. Thus, G. Turovsky notes the following types of conflicts arising at the regional level: institutional, or constitutional, which is a conflict between political institutions; intra-elite conflict between groups of interests; social conflict arising from tension or ill-conceived policies of local authorities; as well as ethnic and religious (interethnic) conflict, the subjects of which are ethnic (national) and/or confessional groups. (Turovsky, 2001).

In this regard, undoubtedly, knowledge and development of measures to prevent and resolve this kind of social upheaval involves creative, reflexive rethinking of what has already been developed in this area, and the identification of new concepts demonstrated by the realities of contemporary times. The question is what, in particular may indicate the occurrence of diverse conflicts, such as regional conflicts, asymmetric conflicts, complex conflicts, latent conflicts, hybrid warfare, etc. It seems the theory does not always keep up with what is happening in practice.

2. Methods

The qualitative content analysis of scientific literature from the problem field of the study was used as a research method. This approach allowed determining the methodology of problematisation of the “social conflict” phenomenon as the most effective way of its perception. Based on the problematisation methodology, an attempt is made to identify the main factors that escalate regional conflicts.

The research hypothesis. Analysis of regional conflicts as an attribute of global instability will be more effective when using the methodology of problematisation. At that, the processes of globalization and the external aggravation of conflicts in the region should be considered the main factors of regional conflicts escalation.

2.1. Methodology of the problematisation of the “social conflict” phenomenon as an effective way of its cognition

Speaking about the peculiarities when studying the essence of regional conflicts, as one of the varieties of social conflicts in general, it should be noted that they are traditionally considered within the format of naturalization of this social phenomenon. The essence of this approach is fully reflected by one of the provisions, according to which “the conflict is not fundamentally different from other natural and social phenomena” (Svetlov, 2012, p. 5). This means that in this case the cognition of a variety of social conflicts, such as regional conflicts, is carried out by analogy with any other natural or social object (e.g. Tvaronavičienė 2018a; Tvaronavičienė 2018b; Kazansky, Andrassy 2019; Turen et al. 2019; Pauze et al. 2019). As practice shows, such a way of cognition of any phenomenon, i.e. getting an idea about it by “copying from nature”, does not reliably guarantee that the essence of this phenomenon will be revealed to the end.

In this regard, an alternative to the methodology of naturalization of the phenomenon in the course of its cognition is the methodology of its problematisation. The peculiarity of problematisation is that it begins with the identification of system-forming factors that serve the basis for the origin of the very existence of this phenomenon, followed by the advancement of knowledge based on the logic of further formation and development of this very existence.
The need to refer exactly to this methodology is largely due to the fact that here the main object of the study is exactly the nature of the relationship between the direct participants of joint activities, rather than the reason from which this activity arises, and outside of which, neither regional nor other social conflicts occur at all. At that, it is hard to avoid clashes of various people or all kinds of their collective formations, with needs, interests, etc., which are multidirectional in nature.

Naturally, this inevitably leads to the manifestation of resistance to such a vector of impact of one object (objects) from the other object (objects). “Counter-activity appears when coordination is not considered necessary, while the arisen mutual obstacle acts as a condition of erasing the confronting activity” (Anisimov, 2008, p. 141). Thus, counter-activity is a kind of social activity, when someone tries to “subordinate other activities to their needs without taking into account the features of interests of other activities” (Anisimov, 2008, pp. 250). And this very counter-activity can take a variety of forms – from a simple challenging the legality of the current situation in the most peaceful forms, up to the forced military confrontation. This, in fact, has served the basis to consider any manifestations of counter-activity, the clash of opposing interests, views, and aspirations; a serious disagreement, a heated argumentation, leading to the fight (Anisimov 1991). And the activity itself in this format of confrontation, initially assuming even a kind of subject-subject relationship, acquires a pronounced object-object character. “After all, the conflict is a kind of counter-activity of self-sufficient subjects committed completely disregarding the human essence in another person” (Baturin and Shakirov, 2014, p. 80).

In the context of this vision, on the one hand, the nature of the regional conflicts’ emergence is largely due to the relative small-scale “erasure of certain types of confronting activities” carried out by the participants of collective activities (as a part) in relation to the social activity of the entire certain type of this community (as a whole). On the other hand, it is because of its small scale that the local (both in terms of time and the space) nature of its manifestation becomes the reason of confronting activities (Ushakov, p. 62).

The roots of the causes that contribute to the transformation of present-day regional conflicts into a basic attribute of global instability are largely due to the fact that certain social circles and society forces see them as a rather effective means of satisfying in practice their desire to “improve society”. At that, this desire is not always openly advertised due to the fact that this “improvement” is carried out in favor of their own discretion, even despite all kinds of assurances to the contrary (Coser, 2000, pp. 34, 36).

The use of such a methodological basis allows one to look in general at the essence of regional conflicts as well as the peculiarities of their manifestation in the context of globalization from a slightly different perspective. Thus, all the above confirms the assumption that the use of the methodology of problematisation is effective when analyzing regional conflicts.

2.2. Globalization processes as an escalation factor of regional conflicts

As practice shows, it is globalization processes that today are a dominant factor in the escalation of conflictogenicity, primarily in the social structures of the regional format. These processes, contributing to the internationalization of all economy sectors, are increasingly turning the contemporary world economic space into a single global market. All this, first of all, strikes at the formed and institutionalized social bonds and relationships, both within individual states and on the scale of interstate associations. Against this background, international organizations and their structural subdivisions, such as the UN, OSCE, etc. appreciably lose their prestige and weight.

At the same time, new associations are formed, such as for example the European Union (EU) with its institutions, the World Trade Organization (WTO), and others. Activities of the pre-existing international organizations embodied in various structures of the Council of Europe (COE), the International Monetary Fund (IMF), and NATO are essentially increased. Their functioning has significant impact on both the reorientation and displacement of individual states and even entire regions to the periphery of the world civilization space.
In this regard, there is a marked decline in the role of national states in these processes, taking place against the background of the delegation of some of its most important functions to the newly created international power structures. This, of course, cannot but lead to the loss of national sovereignty by these states and pose a threat even to their territorial integrity, and in consequence, creates favorable conditions for attempts and even open interference in their internal affairs on the part of third forces.

In some cases, this has destructive impact on the national security of these states, provoking various kinds of anti-state protests in these countries. At that, the multiplying internal problems are supplemented by new ones, caused by inflammatory actions from the outside, which are most often aimed at organizing a confrontation to the activities of government agencies on the part of all those who are not completely satisfied with it for any reason. Therefore, the latter, with this kind of aiding, are trying to take advantage of the opportunities being created to satisfy their ambitious claims.

Today in the world there is a radical arrangement not only of global economic, legal, and cultural space. At the same time, searches for models of the so-called multipolar arrangement of the world in general are going on. However, this process itself, projected on the organization of both individual life of a single person, and on the activities of any kind of social structures, turns into a truly multipolar chaos in the life of society.

Indeed, in this case, first of all, new alien ideals, norms, and values are imposed against the will to people’s traditional way of life, entrenched largely due to certain territorial features or regional specifics. In fact, their open westernization takes place, which consists in the reorientation of people’s lives according to the models of Western European or Anglo-American standards.

All of the above confirms the assumption that globalization should be considered a major factor in the escalation of regional conflicts.

2.3. External aggravation of conflictogenity as a factor of regional conflicts’ escalation

It should be noted that today, along with the use of the so-called hard power, soft power finds application more than ever. As known, “hard power” usually manifests in economic, administrative, and even open armed impact. “Soft power” is a power that is implemented in the form of a certain communicative impact, in which process the imposed behavior is perceived by the recipient as his own free and voluntary choice, even bringing joy and pleasure (Rusakova, 2015, p. 7).

And all this is done under the onslaught of increasingly manifested policy of mondialism. At the same time, the values of ethnic, religious and even national character are categorically declared to be less significant than the so-called universal values. At the same time, social rules, laws, and other regulations in general, due to which, in fact, the social activities of people are carried out, ensuring today the functioning of various life spheres of the contemporary world civilization space, undergo changes.

However, this desire to rearrange the whole world in order to “improve” it does not take into account one significant circumstance. This is hardly feasible in principle, because for example, “according to analysts of the UN Development Program, at the beginning of the 21st century, the total wealth of 225 richest people in the planet exceeded one trillion USD that was equal to the annual income of 2.5 billion poor people, who make up 47% of the world’s population” (Osmova, 2006). And this contrast has an increasing tendency to deepen (Tvaronavičienė, Gatautis 2017).

In such an environment, the “privileged” countries are very zealous of the emergence of all that can pose a threat to their position in the context of globalization. At that, any means are in the course, even up to the most inhumane. However, this is increasingly being done under the slogan of “grafting democracy” to more “backward” countries in terms of civilization.
Against this background, the contours of a new vector in the escalation of conflictogenity in various spheres of present-day international relations are becoming more visible. Its essence is the increasingly applied policy of “demonization of the designated threat”, which is presented in every possible way as having features that pose a danger, at least, to all democratic gains already existing in the world. At that, anyone can become the contender for this role of “outcast”: a specific socio-political leader, the whole state, or even a particular religion. For the sake of this, the principles of morality and norms of international law, and interstate agreements are ignored. These purposes are pursued in the framework of “double standards” policy. The adoption of important political decisions is carried out based on evidence grounds not adopted throughout the civilized world, but simply laid out in the mass media, or based on information, opinions, and even rumors posted on the Internet.

One of the most popular methods of escalation of conflictogenity at regional level in recent years has been the export of so-called “color revolutions”, which is the local initiation of small-scale (regional in nature) conflicts through the organization of mass riots, anti-state coups, and various kinds of putsches organized on the basis of proven technology.

In these regions, the focus is made on the opposition forces. The choice of these regions, as a rule, is not accidental. First of all, they are attractive because of the wealth of natural resources, geopolitical location, and imaginary or real threat to the interests of stronger players in the international arena, etc.

The initiators of the “color revolutions” do not stop at nothing to stimulate and intensify counter-activity to the policy, which is currently carried out by the authorities. In recent years, especially in Islamic countries, there has been an increasing emphasis on inciting hatred among the population on religious grounds, to some extent related to the crisis of the identity of Islamic communities. To aggravate the situation, various (even artificially organized) extremist groups and members of international terrorist organizations have become increasingly involved.

All this is deliberately used to destabilize economic, political, religious, and other life spheres within certain territories of specific states or even certain regions of the entire geopolitical space. Usually, the main objective consists in influencing the policy pursued by the existing authorities; ousting from power or eliminating the leadership, up to its physical liquidation; bringing to power forces loyal to external actors, etc. This is clearly evidenced by the events that took place in Iraq, Afghanistan, Libya, Syria, Egypt, and a number of other countries.

However, the consequences of external intervention are a harbinger of almost uncontrollable chaos in the lives of a number of states, even those that are far from the epicenter of conflicts. The mass influx of refugees to Europe provoked by such events has already caused a complex of problems for most of its countries, which are not connected only with one socio-economic sphere.

Actions by a number of states that rely in their politics on the rampant of “protestocracy” in order to reformat the dominant paradigm and regional way of life of a number of states in the Middle East and the African continent acquire today a significant role in changing the configuration of the manifestation of global instability, which further emphasizes its unmanageable nature.

All of the above confirms the assumption that the aggravation of the situation in the region caused by external influence is a major factor in the escalation of regional conflicts.

3. Conclusion

The results of the study confirmed the assumption that the analysis of regional conflicts as an attribute of global instability is more effective when using the methodology of problematization. At that, the globalization processes and external aggravation of conflict in the region should be considered the main factors of escalation of these conflicts.
In conclusion, it should be noted that one of the features of the present moment is that the intensity of the manifestation of confrontation is increasing also due to the fact that the countries, occupying today a leading position in the world, are increasingly trying to assert their claims to kind of “subjectivity”, not particularly taking into account the interests of their environment. When manifesting their power and superiority, they not only seek to benefit from the conflictogenic nature of the globalization process, but manifest their self-centeredness even more to destabilize situation in the world. At that, they seek to demonstrate their rivalry not so much in their own, but in someone else’s territory.

In society, conflicts exactly of the regional format, even in the most inhumane manifestations, are becoming today the most popular form of solving many important life problems. But the negative consequences of the transformation of these regions into the theater of war make even more chaos in the dynamics of social processes. The regional conflicts themselves, due to their unpredictability and uncontrollability, are increasingly transformed from a means of solving problems even at the local level to an attribute of a threat to stability in the world in general.

A vector of social self-organization of society could serve an alternative to the existing models of multipolar arrangement of the world. In this case all of its physical and legal subjects, manifesting natural counter-activity between each other, should attempt to return this counter-activity to the framework of the subject-to-subject relations.

References


Turen, S.; Abdulla, M.; Farooq, M.O.; Elsoud, M.S.A. 2019. Causes of Non-Performing Loans: The Experience of Gulf Cooperation...


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Abstract. This scientific paper considers the essence of investment, financial and operational activity of the enterprise in the context of provision of a high level of its economic security, and describes the importance of investment support for the economic activity of the enterprise and the place of investments for the factor of economic security. The method of estimation of investment, financial and operational risks based on matrix and expert approaches was offered. The modelling of the systemic risk impact on the economic security of the enterprise was performed and recommendations on the neutralization of the influence of risks were developed.

Keywords: systemic risks, economic security, security breach, investment process stages, matrix of risk analysis, expert evaluations


JEL Classifications: F52, O39

1. Introduction

Market economy conditions require a constant search for new ideas, opportunities, and orientation towards innovation. The development of any system becomes possible thanks to active investment, finance and activities. However, the great degree of a risk of deterioration of economic safety, and risks that invested funds will not bring the expected results, as well as a lack of own funds, insolvency of customers and unacceptable conditions of investment and lending inhibit the development of enterprises. The economic evaluation of investment, financial and operational activities of the enterprise and output types of risks that allows to comprehensively examine the state of economic safety in order to identify problem situations in its observance and strengthening becomes crucial.

2. Literature Survey

The following research studies are devoted to the study of organizational and economic problems of the impact of heterogeneous risks and the advocacy of the economic safety of companies and enterprises (Barton, et al. 2001; Brockett and Rezaee, 2012; Dobelli, 2013; Kaplan and Mikes, 2012; Keynes, 2013; Marilena and Corina, 2012; Ozturk, 2016; Perry, 2017; Tvaronavičienė, 2018; Kuzmin et al. 2019; Cherchyk et al. 2019; Vorotnikov, et al. 2019; Limba et al., 2019). At the same time, the insufficient attention is paid to issues related to the management of the flows of risks of investment, financial and operational origin and the development of methodological recommendations for maintaining a high level of economic safety of the enterprise.

The purpose of the paper is to formulate and test case-based methodological approaches to the search and reduction of the impact of investment, financial and operational risks in order to maintain the company’s proper economic safety.
3. Methods

The financial and economic crises affecting the world economy from time to time raise the issue of the need to find methodological tools and practical principles for reduction of the impact of investment, financial and operational risks on business activities of enterprises and prevent the reduction of economic safety. On the one hand, the operational activities set the task for investment activities, since the need to increase the competitiveness of an enterprise requires investment. At the same time, the necessary sources of investment can be attracted through financial activities (Nikitina et al. 2018; Shvetsova et al. 2018; Masood et al. 2019).

4. Results

On the other hand, it is investment activities are a preliminary step for the organization of the main activities of the enterprise (Fig. 1).

![Fig. 1. Scheme of interaction of investment, financial and operational activities of the enterprise](image)

Source: Dobson and Bertels, 2017

So, we form an updated concept of investment activities in industry, which is a strategic set of consistent actions when investing funds and resources to stimulate investment activities in order to obtain competitive advantages or obtain the benefits in some form in the future period based on a market approach, taking into account the conditions of production and prevention of violation of the safety of the business entity (Dykha M. V., 2016).

The attraction of investments, the use of investment resources will increase the risk-protection of enterprises, which will promote the restoration of the reproductive process in industry and the safety of existence. This approach entails obligatory consideration of the economic essence of the activities as an investment-innovation ones. The investment-innovation activities in industry are connected with investment in the production of innovations, that is, a systematic and consistent process of implementation of innovation-investment projects, stimulation of investment activities of economic entities in order to provide competitive advantages in the forecast period (based on market orientation) (Gitman & Joehnk 2011).

The main objective of the operational, investment and financial activity in the industry should be to create the optimal conditions for the development and intensification of the use of innovative potential based on investments. The main principles of operational, investment and financial activities in industry are purposefulness, unity, mutual influence, movement, adaptability, knowledge, efficiency, multivariateness, systemicity, regulation of actions, complexity, social, ecological and economic safety.
The purposefulness involves directed investments in order to obtain an effect in a certain time period. The efficiency implies extraction of profit and (or) other effect. The multivariateness is possible when evaluating the efficiency of investments. The systemacity implies a certain investment process algorithm. The controllability of actions means the ability to influence investment activities. The complexity allows the use of various methods and techniques for the regulation of operational, investment and financial activities. The social, environmental and economic security is seen as a necessary condition for the implementation and development of enterprises and the challenge of their economic safety (Bertels and Dobson 2017).

It is especially necessary to distinguish the investment activities of enterprises, which forms the largest list of risks to economic activities. The investment activities is the intensity of investments, which is characterized by volumes and rates of attraction of investments and obtaining a socio-economic result with effective use of investments. At the same time, the level of investment attractiveness serves as an integral indicator summarizing the multi-directional impact of investment potential and investment risk indicators (Kruschwitz & Husmann, 2012).

The investment potential is in the form of an amount of objective prerequisites for investment, which depends both on the diversity of spheres and objects of investment, and on their economic health. Investment potential is a characteristic that takes into account the main macroeconomic characteristics, the territory’s saturation with factors of production, consumer demand of the population, other indicators. The structure of investment potential includes the following components: resource and raw material potential; production potential; consumer potential; infrastructure potential; labour potential; institutional capacity; financial potential; innovative potential; intellectual potential, and marketing potential (Karpenko et al., 2018).

In relation to investments, the investment climate shows the extent to which a favourable situation can be favourable and unfavourable. The favourable investment climate promotes active activity of the investor and stimulates the inflow of capital (Fig. 2).

Fig. 2. Stages of the investment process at the enterprise

Source: Astakhova, 2012; Eckbo 2007
An unfavorable investment climate means an increase in risk for an investor, which in turn leads to capital leakage and a decline in investment activity. The investment risk reflects the feasibility of investment in this territory, the probability of loss of investment and income from them. The investment risk is a qualitative aspect of investment attractiveness and is subdivided into: economic, social, political, financial, ecological, and criminal (Tetiana et al., 2018). We consider it important, when considering investment activity, to introduce the notion of an investment complex.

The investment complex should be understood as the integral combination of organizations belonging to one (related) industry, related to each other by economic relations in the field of production and distribution of products, goods, services in a specific market segment (territory) with a view to optimize the use and distribution of investment resources (Dudzevičiūtė and Prakapienė, 2018). Factors influencing investment and innovation activity are subdivided, based on the possibility of influence on them by the company, into objective and subjective ones (Fig. 3).

The subjective factors are related to management activities. Considering investment and innovation activities as a complex multi-level multifunctional economic system, it is necessary to use in its formation and development the directions of its activities, which ensure its systemic rationality. The links between subjects and objects of investment and innovation activities are diverse. It is necessary to distinguish between them system-forming connections and to reveal the nature of their manifestation in the direction of development of the investment activity itself. The main directions of investment activities are measures to organize a favourable regime for activities of domestic and foreign investors, increase profitability and minimize risks in the interests of stable socio-economic development and raising the standard of living of the population. The result of the investment activities is the volume of involvement in the development of the industry and organization of investment resources (Teletov et al., 2017).

The mechanisms of control and ongoing management of investment, financial and operational risks, and overcoming the pressure on the company’s economic safety will be conducted on the bases of the case-by-case basis through the introduction of Case-Enterprise - (Public Joint Stock Company) PJSC Company A” for modelling the parameters of scientific research. Under the investment, financial and operational risks at PJSC Company A, we understand the probability of losses of a number of production assets during the active phase of production. During the risk management procedures at the enterprise, it analyzes the sources of risks, performs the ongoing monitoring, assesses their importance and level of threats, and controls the qualitative components of these risks (Bordens, 2006; Lake, et al., 2016).

The mechanism for monitoring of investment and operational risks at PJSC Company “A” aims at achievement of the following objectives:
– risks should be controlled and analytically justified by the management of the enterprise;
– the risks should be in the intervals of certain tolerances determined expertly and have a map of compliance with them;
– the package of decisions regarding the acceptance of permissible risks should correspond to the strategic map of balanced indicators of the enterprise;
– decisions on the admission of the occurrence of certain types of risks should be agreed upon and justified at the highest level of management;
– the expected set of economic benefits must fully compensate for the risks inherent in the system;
– motivational components for achievement of significant profitability indicators must pass obligatory acceptance of the permissible level of risk.

The second step of our analysis is to determine the parameters of the already existing system of risk management of the investigated enterprise. This system provides a series of tasks and processes (COSO, 2017; Paseková et al., 2017):
– balance the ratio of forecasted risks, potential, capital and production growth rates;
– reduce uncertainty when making investment decisions;
– reduce starting conditions and thresholds of investment and production risks to a minimum;
– to introduce a system of forecasts of the occurrence of certain threats and risks;
– the overall process of reduction of the costs of overcoming risks;
– to improve the system of risk management at the investigated enterprise by introducing a modern control system.

![Diagram of factors influencing investment, financial, and operational activities]

**Fig. 3.** Factors influencing the investment activity of the enterprise

*Source: Ohotina, et. al., 2018; Tvaronavičienė and Čermevičiūtė, 2015.*
The objective factors are the availability of raw materials and climatic conditions. Objective factors restraining the investment activity inherent in the industry: pronounced seasonality of production; long production cycle; slow turnover of investments; high capital intensity of products; natural and climatic factor and demographic factor, etc. (Reischmann, 2016). The processes of risk management at the enterprise absorb all of its levels of management where the conditions of occurrence of those or other risks are constantly formed. The current structure of simplified management of existing risks in the enterprise is presented in Figure 4.

![Levels of risk management](image)

**Fig. 4.** Structure of current risk management at the PJSC Company A.

*Source: Designed by the authors*

The economic operations of the investigated enterprise, like any other enterprise, accompany significant volumes of production and financial risks, the lateness of which reveals the consequences of production losses and fluctuations (Ignatavičius, et al., 2015). Table 1 lists the main types of damages and losses and factors of these risks, all of which were identified analytically and by expert estimates.

Risk factors that originate from the environment, and this is primarily a macro environment and, of course, the internal environment. All factors are divided into three levels.

**Table 1.** System risks of investment, financial and operating activities of PJSC Company “A”, million Euro (analytical model)

<table>
<thead>
<tr>
<th>Description of losses</th>
<th>Risk factor</th>
<th>Source (macro, micro, internal environment)</th>
<th>Amount of damages, million euros</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The cost of removal of defects</td>
<td>Violation of technology</td>
<td>Internal environment</td>
<td>2.68</td>
</tr>
<tr>
<td>2. Fines for untimely execution of works</td>
<td>Lack of production personnel</td>
<td>Internal environment</td>
<td>0.25</td>
</tr>
<tr>
<td>3. Losses from extension of production deadlines</td>
<td>Unsatisfactory preparation of production</td>
<td>Internal environment</td>
<td>2.68</td>
</tr>
<tr>
<td>4. Over expenses for salary payment</td>
<td>Weak organization of work</td>
<td>Internal environment</td>
<td>6.58</td>
</tr>
<tr>
<td>5. Downtimes</td>
<td>Uneven loading</td>
<td>Microenvironment</td>
<td>6.74</td>
</tr>
<tr>
<td>6. Expenses for payment of additional interest for using a loan</td>
<td>Exceeding the planned inflation rate</td>
<td>Macro environment</td>
<td>0.3</td>
</tr>
<tr>
<td>7. Payment of fines to creditors</td>
<td>Untimely payments</td>
<td>Internal environment</td>
<td>0.01</td>
</tr>
<tr>
<td>8. Costs of crediting working capital shortages</td>
<td>Untimely receipts from debtors</td>
<td>Microenvironment</td>
<td>3.1</td>
</tr>
</tbody>
</table>
Energy sales

<table>
<thead>
<tr>
<th>Risk Description</th>
<th>Source of Risk</th>
<th>Subtype of Risk</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>No income for additional work</td>
<td>9.</td>
<td>Untimely registration</td>
<td>Microenvironment</td>
</tr>
<tr>
<td>Refusal of the customer from the contract</td>
<td>10.</td>
<td>Untimely execution of the contract</td>
<td>Microenvironment</td>
</tr>
<tr>
<td>Refusal of the customer to accept work</td>
<td>11.</td>
<td>Inadequate legal support</td>
<td>Internal environment</td>
</tr>
<tr>
<td>Uneven loading of existing capacities</td>
<td>12.</td>
<td>Bad awareness of the needs of production, the lack of necessary market proposals</td>
<td>Internal environment</td>
</tr>
</tbody>
</table>

In general: 200

Source: calculated by the authors

At the first level, we lay out those types of risks that the investigated enterprise can not fully control. These are the risks of economic, political, demographic, scientific and technical natural and cultural origin (Čirjevskis, 2016).

At the second level, we place the types of risks that are generated by competitors, suppliers, and consumers. The enterprise can influence their activities to a certain extent and in certain circumstances.

At the third level, we lay out the types of risks that are generated by the internal environment and are fully controlled: production, investment, innovation finance, personnel, etc. To identify risk factors, we use a risk analysis matrix. We will present the results of the study in Table 2.

Table 2. Risk Analysis Matrix of PJSC Company A (Analytical Model)

<table>
<thead>
<tr>
<th>Sources of Risks</th>
<th>Macro environment</th>
<th>Micro environment</th>
<th>Internal environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Divisions</td>
<td>political</td>
<td>economic</td>
<td>natural</td>
</tr>
<tr>
<td>Management</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Production</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Finances</td>
<td>FR_1 FR_2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Marketing</td>
<td>MR_1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fixed assets</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Quality</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Legal</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: calculated by the authors

We will transfer all types of risks identified by us in the enterprise to table 3 according to the work of each level. The top managers and managers of the middle management were appointed as the experts. We evaluate the consequences of states, probability and quality of management using a nine-point scale from three levels of assessment (Allianz, 2018). For analysis we will have: little serious (1-3), moderate (4-6); serious (7-9 points). For event probability: low probability (1-3); average probability (4-6); high probability (7-9). For management quality: low quality (7-9); average quality (4-6); high quality (1-3).
Table 3. The summary table of assessments of investment, financial and operational risks and risks identified by experts for PJSC Company A (analytical model)

<table>
<thead>
<tr>
<th>Risk code</th>
<th>Formulation of a risk</th>
<th>The magnitude of the possible damage, million euros</th>
<th>Risk factor</th>
<th>Balance risk assessment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>DR_1</td>
<td>Losses from the low quality of the management system</td>
<td>1,000</td>
<td>Low qualification of managerial staff</td>
<td>Event probability: 9, Event consequences: 1, Risks management quality: 7, Integral score (5+6+7): 17</td>
</tr>
<tr>
<td>DR_2</td>
<td>Losses from improper performance of managerial decisions</td>
<td>1,000</td>
<td>Low labour discipline</td>
<td>Event probability: 9, Event consequences: 1, Risks management quality: 7, Integral score (5+6+7): 17</td>
</tr>
<tr>
<td>PR_1</td>
<td>The risk of decrease in the amount of work to be done</td>
<td>1,000</td>
<td>Particularly adverse weather conditions</td>
<td>Event probability: 4, Event consequences: 1, Risks management quality: 9, Integral score (5+6+7): 14</td>
</tr>
<tr>
<td>PR_2</td>
<td>Risk of loss of competitiveness by terms of repair</td>
<td>2,000</td>
<td>Lack of technical innovations compared to competitors</td>
<td>Event probability: 7, Event consequences: 2, Risks management quality: 7, Integral score (5+6+7): 16</td>
</tr>
<tr>
<td>BP_3</td>
<td>Risk of downtime</td>
<td>1,000</td>
<td>Uneven loading of production</td>
<td>Event probability: 7, Event consequences: 1, Risks management quality: 5, Integral score (5+6+7): 13</td>
</tr>
<tr>
<td>BP_4</td>
<td>Risk of income loss due to lack of production personnel</td>
<td>6,000</td>
<td>Insufficient number of production personnel</td>
<td>Event probability: 8, Event consequences: 6, Risks management quality: 7, Integral score (5+6+7): 21</td>
</tr>
<tr>
<td>PR_5</td>
<td>Risk of sanctions for late execution of works</td>
<td>1,000</td>
<td>Worker strikes due to salary debts</td>
<td>Event probability: 7, Event consequences: 1, Risks management quality: 5, Integral score (5+6+7): 13</td>
</tr>
<tr>
<td>FR_1</td>
<td>Risk of increase in tax expenses</td>
<td>1,770</td>
<td>Cancellation of the land tax exemption</td>
<td>Event probability: 7, Event consequences: 2, Risks management quality: 9, Integral score (5+6+7): 18</td>
</tr>
<tr>
<td>FR_2</td>
<td>Risk of increase in financial expenses</td>
<td>750</td>
<td>Increase in lending rate 5%</td>
<td>Event probability: 7, Event consequences: 1, Risks management quality: 9, Integral score (5+6+7): 17</td>
</tr>
<tr>
<td>FR_3</td>
<td>Risk of loss due to non-payment for work performed</td>
<td>1,000</td>
<td>Unsatisfactory paying capacity of consumers</td>
<td>Event probability: 5, Event consequences: 1, Risks management quality: 5, Integral score (5+6+7): 11</td>
</tr>
<tr>
<td>FR_4</td>
<td>Risk of losses through suppliers</td>
<td>1,000</td>
<td>Untimely or poor quality delivery</td>
<td>Event probability: 3, Event consequences: 1, Risks management quality: 5, Integral score (5+6+7): 9</td>
</tr>
<tr>
<td>FR_5</td>
<td>Risk of over-planned variable costs</td>
<td>1,000</td>
<td>Low quality of planning and control in production</td>
<td>Event probability: 8, Event consequences: 1, Risks management quality: 5, Integral score (5+6+7): 14</td>
</tr>
<tr>
<td>MR_1</td>
<td>Risk of loss from reduction of market volume</td>
<td>10,000</td>
<td>Introduction of unfavorable customs clearance rules</td>
<td>Event probability: 1, Event consequences: 7, Risks management quality: 9, Integral score (5+6+7): 17</td>
</tr>
<tr>
<td>MR_2</td>
<td>Risk of loss from reduction in a market share</td>
<td>2,500</td>
<td>Unpredictable actions by competitors</td>
<td>Event probability: 2, Event consequences: 3, Risks management quality: 7, Integral score (5+6+7): 12</td>
</tr>
<tr>
<td>MR_3</td>
<td>The risk of customer rejection from orders</td>
<td>2,500</td>
<td>High price</td>
<td>Event probability: 5, Event consequences: 3, Risks management quality: 5, Integral score (5+6+7): 13</td>
</tr>
<tr>
<td>MR_4</td>
<td>Risk of deterioration of payment conditions and price changes</td>
<td>2,500</td>
<td>The worsening of the market situation, untimely payment</td>
<td>Event probability: 5, Event consequences: 3, Risks management quality: 6, Integral score (5+6+7): 14</td>
</tr>
<tr>
<td>RF_1</td>
<td>The risk of loss or damage to the FA</td>
<td>100,000</td>
<td>Natural disasters</td>
<td>Event probability: 1, Event consequences: 9, Risks management quality: 9, Integral score (5+6+7): 19</td>
</tr>
<tr>
<td>YR_1</td>
<td>The risk of loss from rejection</td>
<td>2,500</td>
<td>Disadvantages in technological support and control</td>
<td>Event probability: 6, Event consequences: 3, Risks management quality: 5, Integral score (5+6+7): 14</td>
</tr>
<tr>
<td>YuR_1</td>
<td>Risk of loss from sanctions for late fulfillment of financial obligations</td>
<td>2,000</td>
<td>Lack of funds to fulfill all obligations</td>
<td>Event probability: 9, Event consequences: 2, Risks management quality: 5, Integral score (5+6+7): 16</td>
</tr>
</tbody>
</table>

Source: calculated by the authors

Within the scope of the study, we will range the identified risks and form a map for these risks (Belás, et al., 2017). We will calculate the factors of importance for the group of factors using the data in Table 3:

– the influence of macroeconomic factors on the level of losses is determined as a factor - 0.3 million euros or 0.0015;
– the influence of microeconomic factors on the level of losses is determined as a factor - 131.7 million euros or 0.6585;
– the influence of internal-and-organization factors on the level of losses is determined as a factor - 68 million euros or 0.34;
At the final stage, we will multiply the coefficient of importance of the group of factors in order to obtain the resulting integral estimates for risks. The results are presented in Table 4.

Table 4. The summary table of assessments of investment, financial and operational risks and risks identified by experts for PJSC Company A (analytical model)

<table>
<thead>
<tr>
<th>Name of a risk</th>
<th>Integral score</th>
<th>The source of a risk</th>
<th>Coefficient of significance</th>
<th>Final score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Losses from the low quality of the management system</td>
<td>17</td>
<td>Internal environment</td>
<td>0.34</td>
<td>5.78</td>
</tr>
<tr>
<td>Losses from improper performance of managerial decisions</td>
<td>17</td>
<td>Internal environment</td>
<td>0.34</td>
<td>5.78</td>
</tr>
<tr>
<td>The risk of decrease in the amount of work to be done</td>
<td>14</td>
<td>Macro environment</td>
<td>0.0015</td>
<td>0.02</td>
</tr>
<tr>
<td>Risk of loss of competitiveness by terms of repair</td>
<td>16</td>
<td>Macro environment</td>
<td>0.0015</td>
<td>0.02</td>
</tr>
<tr>
<td>Risk of downtime</td>
<td>13</td>
<td>Internal environment</td>
<td>0.34</td>
<td>4.42</td>
</tr>
<tr>
<td>Risk of income loss due to lack of production personnel</td>
<td>21</td>
<td>Internal environment</td>
<td>0.34</td>
<td>7.14</td>
</tr>
<tr>
<td>Risk of sanctions for late execution of works</td>
<td>13</td>
<td>Internal environment</td>
<td>0.34</td>
<td>4.42</td>
</tr>
<tr>
<td>Risk of increase in tax expenses</td>
<td>18</td>
<td>Macro environment</td>
<td>0.0015</td>
<td>0.03</td>
</tr>
<tr>
<td>Risk of increase in financial expenses</td>
<td>17</td>
<td>Macro environment</td>
<td>0.0015</td>
<td>0.03</td>
</tr>
<tr>
<td>Risk of loss due to non-payment for work performed</td>
<td>11</td>
<td>Microenvironment</td>
<td>0.6585</td>
<td>7.24</td>
</tr>
<tr>
<td>Risk of losses through suppliers</td>
<td>9</td>
<td>Microenvironment</td>
<td>0.6585</td>
<td>5.93</td>
</tr>
<tr>
<td>Risk of over-planned variable costs</td>
<td>14</td>
<td>Internal environment</td>
<td>0.34</td>
<td>4.76</td>
</tr>
<tr>
<td>Risk of loss from reduction of market volume</td>
<td>17</td>
<td>Macro environment</td>
<td>0.0015</td>
<td>0.03</td>
</tr>
<tr>
<td>Risk of loss from reduction in a market share</td>
<td>12</td>
<td>Microenvironment</td>
<td>0.6585</td>
<td>7.90</td>
</tr>
<tr>
<td>The risk of customer rejection from orders</td>
<td>13</td>
<td>Microenvironment</td>
<td>0.6585</td>
<td>8.56</td>
</tr>
<tr>
<td>Risk of deterioration of payment conditions and price changes</td>
<td>14</td>
<td>Microenvironment</td>
<td>0.6585</td>
<td>9.22</td>
</tr>
<tr>
<td>The risk of loss or damage to the FA</td>
<td>19</td>
<td>Macro environment</td>
<td>0.0015</td>
<td>0.03</td>
</tr>
<tr>
<td>The risk of loss from rejection</td>
<td>14</td>
<td>Internal environment</td>
<td>0.34</td>
<td>4.76</td>
</tr>
<tr>
<td>Risk of loss from sanctions for late fulfillment of financial obligations</td>
<td>16</td>
<td>Internal environment</td>
<td>0.34</td>
<td>5.44</td>
</tr>
</tbody>
</table>

Source: calculated by the authors

Let’s choose the risks with the highest values of the final estimation being guided by the Pareto principle - 20-25% of the risks with the highest values of the final evaluation, that is: MR_4 - risk of deterioration of payment terms and price changes (9.22); MR_3 - the risk of a customer’s refusal from orders (8.56); MR_2 - risk of loss from a decrease in the market share (7.9); FR_3 - risk of loss due to non-payment of work (7.24); PR_4 - risk of loss of income due to lack of production personnel (7.14); FR_4 - risk of loss through suppliers (5.93).

We will compile a summary chart of the groups of risks (Table 5).

Table 5. The map of investment, financial and operational risks and risks identified by experts for PJSC Company A (analytical model)

<table>
<thead>
<tr>
<th>Severity of the consequences</th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probability of the event</td>
<td>BP_4</td>
<td>MR_2, FR_4</td>
<td>MR_4, MR_3, FR_3</td>
</tr>
</tbody>
</table>

Source: calculated by the authors

So, we have obtained the result that the system of management of investment and production risks at the enterprise PJSC Company “A” is sufficiently effective and has an independent structure indicating the possibilities of forecasting risks, processing of operational information with the aim of making advance decisions on macro and microeconomic events.
But on the other hand, the analysis showed that the system is not working thoroughly, there is a large number of production, innovation and investment risks, and this is seen from the fact that the investigated company received losses of more than 200 million euros. This gives us grounds to start development of measures on provision of support of investment activities of the enterprise, which will minimize the whole list of risk identified.

**Fig. 5.** Stages of implementation of the process of management of investment, financial and operational risks of the enterprise

*Source:* Designed by the authors
Taking into account the fact that one of the main risks for PJSC Company “A” was the risk associated with investment and production contracts, there is a need to allocate those risks that should become a priority of measures for the economic safety of the enterprise under investigation in the mechanism of combating the risks. Let’s determine more substantially the main and determining stages of risk management at PJSC Company “A”.

At the first stage of risk management it will be advisable to evaluate the state of affairs in the field of production. At the diagnostic stage, the management of an enterprise should gather information about the properties and structure of the object of the risk studied, identify the strategic and tactical objectives of the measures, analyse the situation and prospects of the development of the situation and the impact of the external environment (Fig. 5).

5. Discussion

After that, we can formulate the necessary methods for managing investment, financial and operational risks, which were determined by the results of the survey (MSCI, 2018). The methods of risk management, which estimates have the most impact are presented in the table (Table 6).

<table>
<thead>
<tr>
<th>Risk / Possible damage</th>
<th>Methods of influence</th>
<th>Direction of influence</th>
<th>Funds for implementation of this method of risk management / Coefficient of economic efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Risk of income loss due to lack of production personnel</td>
<td>Reduction of the size of the damage</td>
<td>Conduct a series of organizational recruitment activities</td>
<td>No additional expenses</td>
</tr>
<tr>
<td>2. MR_4 - risk of deterioration of payment terms and changes in supplier prices/2,500</td>
<td>Prevention of damage</td>
<td>Diversification of suppliers</td>
<td>No additional expenses</td>
</tr>
<tr>
<td>3. MR_3 - the risk of a customer’s refusal from orders/2,500</td>
<td>Reduction of the size of the damage</td>
<td>Reduced production costs and increased cost control and production organization</td>
<td>No additional expenses</td>
</tr>
<tr>
<td>4. FR_3 - risk of loss due to non-payment for works/1,000</td>
<td>Prevention of damages and reduction of their size</td>
<td>studying paying capacity of the customer, use of factoring</td>
<td>Factoring - from 2 to 50% of the amount receivable</td>
</tr>
<tr>
<td>5. MR_2 Risk of loss from reduction in a market share</td>
<td>Prevention of damage</td>
<td>Constant monitoring and forecasting of competitors</td>
<td>No additional expenses</td>
</tr>
<tr>
<td>6. FR_4 - Loss risk through suppliers/1,000</td>
<td>Prevention of damage</td>
<td>Strengthening of control over compliance by suppliers with contractual terms, imposition of penalties in contracts that are adequate to possible damages</td>
<td></td>
</tr>
</tbody>
</table>

Total: 15,500 million euros
Economic efficiency factor: 15,500/500 = 31

Source: calculated by the authors

At the very beginning, one should determine the most probable and complex risks that, over time, become more predictable, and the portfolio of future risks shall be formed on this basis. The procedure for diagnosing risks can take place through the use of a set of formal and informal approaches and methods based on the introduction of information of a subjective or objective origin. The current amount of information will suffice to make expert decisions at the next stages of the risk management system (Li, et al., 2017). For a risk of type BP_4, which is defined as the risk of loss of potential income due to the lack of production personnel, we propose a method of reduction of the amount of losses through the implementation of incentive measures for the labour force who obtains education in the professional institutions of the region or area where the units of PJSC Company “A” are operating and there is the possibility of full-fledged contracts for the training of specialists.
Conclusions

At PJSC Company A, we can state the chronic and permanent shortage of skilled workforce (operational risks) that has special knowledge and skills. This leads to the company being forced to refuse to execute a number of projects and orders in the main field of economic activity, which will greatly affect the investment and innovation attractiveness, and hence the level of economic safety. On this basis, we have failures in the timing of the work, which ultimately leads to financial losses and badly affects the competitive status of the company’s safety. Consequently, we can conclude that the work with a number of risks may not require significant costs, but in case of levelling out these risks, new effects can create conditions for stabilizing the financial state of the case company and its gradual development to the lossless level of work.

Previous analytical calculations and methodological summaries have shown that the effectiveness of the risk management system produces an integral risk factor for the entire investigated enterprise in the amount of 31 units, from which it follows that each conventional monetary unit that we can spend on managing a certain range of risks of the investigated enterprise can save 31 euros, possible losses for every 1,000 euros money units for investment in production and material development. So, we have received an effective methodological approach to detect and reduce the impact of investment, financial and operational risks on the company’s economic security.

References


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STRUCTURING ECONOMIC SECURITY OF THE ORGANIZATION

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Abstract. The key components in economic security system of the enterprise, which have the greatest influence of factors in external and internal environment are defined. The structuring of strategic economic security of an enterprise as an object of management was done. The structural model of providing comprehensive strategic economic security was proposed. The introduced structural model solves the issue of conceptualization of the economic security architecture and is a unitary system. In providing strategic economic safety of the enterprise it is offered to allocate the presence of an object that is at risk, and the presence of factors that have a threatening effect on the safety of the object as its constituents.

Keywords: economic security of the enterprise, external and internal environment, structural security model, strategic position of the enterprise, business process, object of management


JEL Classifications: F52, O39

1. Introduction

The modern stage of the economy functioning requires a new approach to enterprise management, and the development of such business strategy which would allow the subjects to maintain their competitive advantage for a long term. It is important to ensure stable and highly effective functioning of the enterprise in current conditions, together with the formation of a high potential for its development and growth in the future, it must be provided with economic security.

In modern conditions of management, ensuring economic security of the enterprise is a priority task for any of its organizational and legal forms, the solution of which includes not only the elimination of the threat of crisis phenomena emergence, but also supporting stable and highly effective development, and also the formation of economically safe trajectory of sustainable development. Exactly these states determine the relevance of this study.
2. Literature Survey

The problem of providing and enhancing the economic security of the enterprise is rather widely presented in the scientific works of such scientists as Beer, 1994; Brown, et. al. 2006; D’Agostino, 2008; Dunphy, et. al. 2003; Graham, &Dodd, 2000; Huber, et. al. 2010; Porter, &Kramer 2006; Tvaronavičienė et al., 2018; Jankelová et al., 2018; Cherchyk et al., 2019; Limba et al., 2019). But at the same time, we can state, that modern theory and practice of economic security is facing a number of serious problems, related to the lack of essential certainty in long-term (strategic) economic security, insufficient understanding of its key determinants, in the context of which it is necessary to identify the threats in order to eliminate them, which reduces the predictability of the development prospects and the possibility of strategic prediction of the trajectory life cycle of the enterprise. Due to this, research is needed in the context of providing a conceptual apparatus for evaluating economic security and formulating alternative tools for its provision in a long term perspective (Drobyazko S., 2018). The purpose of scientific work is to determine the elements of economic security at the enterprise, to which destructive factors of its external and internal environment are directed and the development of structural model for ensuring the complex strategic economic security.

3. Methods

Economic security of the company is a consequence, the result of well-arranged and well-adjusted business processes. Business processes of economic activity are a combination of different types of activities of the enterprise, within which at the beginning of the process (“on the input”) used several types of resources, and as a result of the process (“at the exit”) a product that represents the value for the consumer is created. According to the process approach, economic security permeates all levels of the organizational structure of the enterprise. The business processes, existing at the enterprise and its influence on the economic safety of the enterprise are studied. Each process on its “exit” is concentrated on achieving the results that ensure the economic security of economic activity.

But there shouldn’t be only a process approach to managing economic security, since resources are equally important as a necessary condition for the implementation of various processes, persons who carry out work between “input” and “output” of the process. Thereby, there are methodological prerequisites for using an innovative (cyclical) approach in forming the economic security of an enterprise (Monni et al., 2017).

We can determine the basic principles of the formation of strategic economic security of the enterprise (Arsić, Krštić, 2015; Kalyugina, et. al. 2015):

1. System construction. Management of economic safety of the enterprise should be built as a single interconnected set of elements that provides effective development and implementation of managerial decisions. The formation of such a system involves a clear identification and interconnection of the goals and objectives of management, its objects and subjects, the delineation of levels and functions of management, the choosing of effective mechanisms for the implementation of decisions.

2. Integration with the general enterprise management system. This principle is determined by the fact that the management of economic security is carried out directly through the change of business processes in the field of financial management of the enterprise. This determines the need for organic integration of the economic security management of enterprise with other systems of management of its economic activity and imprints on them.

3. Focusing on the strategic goals of the enterprise development. Whatever the effectiveness of any project management decisions in the field of current protection of economic interests from personal threats, they should be rejected if they conflict with the strategic goals and directions of economic development, undermining the possibility of effective implementation of measures to ensure strategic economic security (Karpenko et. al., 2018). Implementation of this principle is also ensured on the basis of the philosophy of enterprise development, which defines the most important strategic parameters of economic growth of the enterprise and the formation of a system of protection of its priority economic interests in the long-time perspective.
4. Complex character of the formed administrative decisions. All managerial decisions in the field of protecting the economic interests of the enterprise from external and internal threats are closely interconnected and have a certain effect on the results of its economic activity. In some cases, this action may be controversial. In this regard, the management of economic security should be seen as a comprehensive management system that manages and ensures the development of interconnected, balanced and interrelated management decisions.

5. High dynamism of management. It was established that managerial decisions on ensuring economic security, developed in previous periods, can often not be used repeatedly in the further stages of economic development of the enterprise. This is due to the mobility of the external and internal environment, which forms a new system of threats or the extent of their manifestation. In this regard, the management of economic security should be characterized by high dynamism of response to the adverse effects of factors of the external and internal environment (Kirchner, & Sperling, 2018).

6. Various approaches to the development of individual management decisions. The implementation of this principle means that the preparation of each managerial decision in the field of economic security of an enterprise should take into account alternative possibilities of action.

7. Adequacy of responding to individual threats to economic interests. The system of economic mechanisms used by the enterprise to neutralize external and internal threats is associated with the cost of financial resources. At the same time, the level of such costs is directly dependent on the number and scale of the use of such mechanisms. Therefore, the inclusion of certain mechanisms for the neutralization of threats to the enterprise’s economic security should come from the real level of this threat and be adequate to the costs of its removal (Mayer et al., 2015).

8. Adaptability of the established system of economic security. The enterprise’s economic security system must be flexible, adaptable to changing external and internal environments, and the emergence of new interests and new types of threats (Best, 2013).

9. Effectiveness of management decisions that are accepted. Taking into account that it is often difficult to express the effect of managing economic security in monetary terms, the assessment of the effectiveness of certain measures may be comparative.

10. Legitimacy of management decisions that are accepted. Using this principle of economic security management in enterprise implies that the whole system of obtaining the necessary informative data, as well as mechanisms for ensuring protection from the threats, should be legitimate, which means that it should be carried out on the basis of the current legislation and shouldn’t contradict the legal acts (Kuril, 2018).

4. Results

We can say that consideration of the strategic economic security of an enterprise as an object of management requires the implementation of a certain content-rich decomposition. Levels of decomposition of the economic security at the enterprise as an object of management will be presented in Figure 1.
From this analysis it follows that the strategic economic security of an enterprise is such a state of security of a functioning enterprise (divisions, economic operations), in which the mechanism of protection against real and potential external and internal threats, as a set of interconnected structural elements, ensures its permanent sustainable development and success in reaching the goals in the long-term period (Powell, 2017).
Table 1. Threats of economic security of the enterprise in terms of business processes of its functioning

<table>
<thead>
<tr>
<th>Business processes of the enterprise</th>
<th>Threats to economic security</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business processes of improvement and development</td>
<td></td>
</tr>
<tr>
<td>Strategic management</td>
<td>Incorrect statement of the mission, strategy, purpose of the enterprise, irrational choice of products produced.</td>
</tr>
<tr>
<td>Technology development</td>
<td>Imperfection of existing production technologies, failures in the selection and implementation of new production technologies.</td>
</tr>
<tr>
<td>Project management</td>
<td>Failure in the selection of projects accepted for implementation at the enterprise.</td>
</tr>
<tr>
<td>Quality management</td>
<td>Inconsistency of raw materials and products produced with existing quality standards.</td>
</tr>
<tr>
<td>Business processes of main activity</td>
<td></td>
</tr>
<tr>
<td>Material and technical supply and sales</td>
<td>Lack of optimization of volumes and terms of delivery of the order (raw materials and other materials). Inappropriate pricing policy for the purchase of raw materials, its low quality.</td>
</tr>
<tr>
<td>Production processes</td>
<td>Crisis of underproduction or overproduction of products. Moral obsolete production of non-compliance with the terms of production.</td>
</tr>
<tr>
<td>Marketing activities and sales</td>
<td>Incorrect definition of the marketing strategy of the enterprise and the positioning of the goods on the market. Irrational pricing policy. Limited marketing.</td>
</tr>
<tr>
<td>Service maintenance by service staff</td>
<td>Ignoring promotional activity. Violation of after-sales service rules.</td>
</tr>
<tr>
<td>Auxiliary business processes</td>
<td></td>
</tr>
<tr>
<td>Enterprise infrastructure support</td>
<td>Mistakes in the development of enterprise development plans. Unreliable accounting and reporting in the company.</td>
</tr>
<tr>
<td>Engineering and technical support</td>
<td>Deviations in the mode of operation of the enterprise due to technical malfunctions, defects of fixed assets</td>
</tr>
<tr>
<td>Information support</td>
<td>Ensuring the preservation and confidentiality of information</td>
</tr>
<tr>
<td>Workflow</td>
<td>Inconsistency in the accounting rules of document circulation. Inaccurate data displaying. Violation of terms of delivery of the documents</td>
</tr>
<tr>
<td>HR</td>
<td>Organization of the regime of work and recreation of the personnel. Appointing of the material responsible persons. Determining the level of access to work and documents.</td>
</tr>
</tbody>
</table>

Source: Designed by the authors

In order to describe the threats of enterprise economic security in the context of business processes, it is necessary to structure the processes of doing business. One of the most important outcomes of the recent years in the area of the strategy use and enterprise level design systems was the allocation of architectural approach. The actual standard in enterprise architecture is considered a comprehensive model (Wheelen, & Hunger, 2015), a collection of existing tables, and is used to describe complex corporate and production systems of any type. The concept of enterprise architecture is a way of unifying and synchronizing the functional and business needs of organizations with the capabilities of security systems in the face of their increasing complexity (Drobyazko S., 2019).

The use of an architectural approach is supposed to be applied in business-process management to ensure its strategic economic security. Consideration of the architecture of the enterprise in terms of business processes and the functional component of threats allow the management of the enterprise (organization) to form an idea about the object of security, identify the problem areas most prone to the emergence and effects of the threats, determine the subjects whose actions can lead to their realization, focus on risk assessment methods, tell about possible response times, but most importantly - develop practical measures to ensure economic security (Ianio-glo, 2015a).

Business processes of improvement and development, which include: strategic management, technology development, project management, quality management. Business processes for the main business include logistics and sales, production processes, marketing activities and sales, services (Raczkowski, Schneider,
2013). Considering this system of business processes as fully describing the activities of the enterprise, the existence of threats to economic security for each separate business operation process should be substantiated (Table 1).

Auxiliary business processes that consist of enterprise infrastructure support, engineering support, information provision, document management and human resources management. Separate components of the strategic economic security of an enterprise can be described in other languages of modeling, using the concepts introduced into a particular structural model of economic security.

These components include contractors, personnel and finance. To the threats of economic security by counterparties is the level of their reliability. The conclusion of various types of transactions, including investment, is an integral part of the functioning of any business. But not always they are successful. In order to minimize the risks of signing “failed” contracts, it is necessary, first of all, to assess the economic soundness of the counterparty. One of the main threats to economic security is the loss of enterprise independence from counterparties, not only legally, but also taking into account the point of view of “removing real content through the use of price mechanisms.” Hence, due to institutional problems associated with the organization of cash flows, the redistribution of real capital in favor of counterparties with a more stable and simultaneously more dynamic structure of transactions is carried out (Strielkowski et al., 2016).

The most complete set of threats to the enterprise’s economic security by counterparties. We will organize the systematization of such threats based on the characteristics of the counteragent, such as: responsibility, truthfulness, seriousness of partner intentions; information about credit history; managerial and legal aspects of the counterparty’s activities; the quality of the proposed cooperation agreement.

At the same time, we propose that one of the main characteristics will be assessing the change in the financial position of the counterparty in the dynamics, which will help to minimize the risk of non-payment, as well as potential investment and credit risks. An explanation for this is the inability of the counterparty to pay off its current debts in the event of a systemic deterioration of its financial situation. Naturally, the company will not be able to pay dividends, which entails the risk of non-receipt of income by the investor. Let us represent this provision in Table 2.

<table>
<thead>
<tr>
<th>Characteristics of counterparties</th>
<th>Threats to economic security</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsibility, truthfulness, seriousness of partnership intentions</td>
<td>The presence of negative information regarding liability, truthfulness, seriousness of the intentions of the counterparty.</td>
</tr>
<tr>
<td>Credit history information</td>
<td>The presence of negative credit history. Lack of credit history information.</td>
</tr>
<tr>
<td>Management and legal aspects of counterparty activity</td>
<td>Involvement of the counterparty in litigation. Lack of positions consistency of the shareholders (owners) of the counterparty on the main issues of activity. Probability of reorganization of counteragents in the near future. Likelihood of opening in the near future or actual start of bankruptcy proceedings and (or) liquidation of the counterparty. There is an arbitration practice in the counterparty previous periods.</td>
</tr>
<tr>
<td>The quality of the proposed cooperation agreement</td>
<td>The poor quality of the cooperation agreement (no essential conditions and guarantees, such as the maturity of the debt, penalties for non-compliance with the terms of the contract, etc.). Lack of cooperation agreement (purchase-sale, performance of works, services rendering, lease, etc.)</td>
</tr>
<tr>
<td>Change in the financial position of the counterparty’s dynamics</td>
<td>The deterioration of the situation, which causes the insolvency of the counterparty. Investment risks and credit risks.</td>
</tr>
</tbody>
</table>

*Source:* Designed by the authors
Among the internal threats to the economic security of enterprises that may come from the staff we allocate the following Lasan, 2010):
- insufficient qualification of the employees;
- weak organization of the personnel management system;
- poor organization of the education system;
- ineffective system of motivation;
- reduction of the number of innovative proposals and initiatives;
- the resignation of skilled employees;
- orientation of employees to solve internal tactical tasks;
- orientation of employees to preserve the interests of the unit;
- lack or weakness of corporate policy;
- low-quality screening of candidates for recruitment.

A significant threat to the financial component of the company’s economic security is the inadequate control over the structure of the enterprise’s investments, the ratio of parts of the financial portfolio to the risk and returns of its components, as well as the low level of control over all aspects of its business, which directly affects the profitability of the business and its growth (Paseková et al., 2017).

A slightly different classification of threats to the economic security of the company on the part of the finance is proposed to be used for the purpose of their full identification in the construction of a company’s security system. The classification of the types of threats to the financial component of economic security (Belas et al. 2017) in the context of the proposed classification features is presented in Table 3.

<table>
<thead>
<tr>
<th>Classification mark</th>
<th>Types of threats to the financial component of economic security</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of financial activity</td>
<td>Threats of financial activity to the enterprise as a whole.</td>
</tr>
<tr>
<td></td>
<td>Threats of financial activity of separate structural divisions (centers of responsibility) of the enterprise.</td>
</tr>
<tr>
<td></td>
<td>Threats of financial activity on realization of separate economic operations of the enterprise.</td>
</tr>
<tr>
<td>Functional type of financial activity</td>
<td>Threats that manifest themselves in the sphere of investment activity of the enterprise.</td>
</tr>
<tr>
<td></td>
<td>Threats that appear in the area of lending activity of the enterprise.</td>
</tr>
<tr>
<td></td>
<td>Threats that are manifested in the field of emission activity.</td>
</tr>
<tr>
<td></td>
<td>Threats that are manifested in innovation.</td>
</tr>
<tr>
<td></td>
<td>Threats that manifest themselves in the field of other types of financial activity of the enterprise.</td>
</tr>
<tr>
<td>Object orientation</td>
<td>Threats to financial operations of the enterprise.</td>
</tr>
<tr>
<td></td>
<td>Threats to the assets of the enterprise.</td>
</tr>
<tr>
<td></td>
<td>Threats to the company’s financial information.</td>
</tr>
<tr>
<td></td>
<td>Threats to financial technologies of the enterprise.</td>
</tr>
<tr>
<td></td>
<td>Threats to financial personnel (financial managers) of the enterprise.</td>
</tr>
<tr>
<td>The character of manifestation</td>
<td>Real Threats.</td>
</tr>
<tr>
<td></td>
<td>Potential threats.</td>
</tr>
<tr>
<td>Sources of origin</td>
<td>External threats.</td>
</tr>
<tr>
<td></td>
<td>Internal threats.</td>
</tr>
<tr>
<td>Nature of origin</td>
<td>Threats generated by the action of objective factors and conditions.</td>
</tr>
<tr>
<td></td>
<td>Threats generated by the actions of the entities of the financial relations of the enterprise.</td>
</tr>
<tr>
<td>Time period</td>
<td>Current threats.</td>
</tr>
<tr>
<td></td>
<td>Long-term threats.</td>
</tr>
<tr>
<td>Level of probability of implementation</td>
<td>Threats with low probability.</td>
</tr>
<tr>
<td></td>
<td>Medium probability threats.</td>
</tr>
<tr>
<td></td>
<td>Threats with high probability.</td>
</tr>
<tr>
<td></td>
<td>Threats that can not be identified.</td>
</tr>
<tr>
<td>The size of the possible damage</td>
<td>Threats with permissible level of damage.</td>
</tr>
<tr>
<td></td>
<td>Threats with critical level of damage.</td>
</tr>
<tr>
<td></td>
<td>Threats with catastrophic damage.</td>
</tr>
<tr>
<td>Possibility of foreseeability</td>
<td>Predictable threats</td>
</tr>
<tr>
<td></td>
<td>Unpredictable threats</td>
</tr>
</tbody>
</table>

Source: Designed by the authors
Hence, among the main threats to the strategic economic security of the enterprise, from a key determinant such as finance, it is proposed to allocate (Ianioglo & Polajeva 2017b; Mason et al. 2013):
- threat of loss of liquidity of the enterprise;
- threat of loss of financial independence of the enterprise;
- threat of the reduction of the efficiency of the enterprise, loss of its profitability and the ability to self-purchase and development;
- threat of aging of fixed assets due to the “transfer” of the depreciation fund;
- threat of unstable enterprise development;
- threat of debt build-up as a result of slowing down the collection of receivables;
- threat of using ineffective credit policy in relation to receivables and payables;
- threat of insolvency of the enterprise;
- threat of reduction of profitability and market value of the enterprise;
- threat of destruction of the value of the enterprise.

As a result of the transformation of threats to the economic security of the enterprise on its components we have found that the threats emanating from the staff, the organization of finance and counterparties completely duplicate the risks of inefficient organization of business processes of the enterprise.

Having determined the system of threats of strategic economic security of the company and also proposing a list of its key determinants on their basis, it seems that the next stage of the research program implementation is the development of methods and indicators to assess the threats emanating from the components of strategic economic security by reducing the internal and external threats of the economic security of the enterprise to the determinants of the micro level (business processes), and the latter, in turn, to resource-determinants of strategic economic (personnel, finances and contractors), as well as the substantiation of the existence of different levels of economic security.

Having substantiated the theoretical basis for the formation of strategic economic security of an enterprise, it seems to be possible for us to develop its structural model. Such a model allows the development of “mobile” systems that respond to changes in the external and internal environment. It establishes contours of response and stable positions. Ontological models solve the problem of conceptualization of the subject areas of the enterprise on the upper levels of architecture and the representation of interconnected business models in a single system (Choi et al., 2017).

Economic security of an industrial enterprise is a continuous process of provision at an industrial enterprise that is in a certain external environment, the stability of its functioning, financial equilibrium and regular profit extraction, as well as the ability to accomplish its goals and objectives, its ability to further develop and improve at various stages in the life cycle of the enterprise and in the process of changing competitive market strategies.

This definition considers economic security as a process that takes into account both the change in the state of the enterprise and the impact of its external environment. Figure 1 shows an approach to analyzing the levels of external and internal threats affecting the economic security of industrial enterprises.

This analysis shows that enterprises in solving the problem of ensuring economic security are able to manage threats to level I, take into account and predict changes in level 1 threats and take actions to reduce the corresponding damage. Level 1 threats are the most serious and least predictable for the enterprise (Bhatia, & Thakur, 2017). Herewith, security of the same object can be carried out by different entities, each at its own level. Having determined in the process of diagnosis by the key indicators of the components the level of economic security of the enterprise, it seems necessary to develop entities of the mechanism for the adoption of management decisions to ensure a high level of strategic economic security of the enterprise, the result of which must be defined strategies for enterprise development (Makedon, et al., 2018).
5. Discussion

At the same time, the process of diagnostics, detection, recognition of threats to the economic security of the enterprise, should be under constant control of process monitoring. The mechanism for making managerial decisions to ensure a high level of strategic economic security of an enterprise, as well as developing a strategy for enterprise development, taking into account its level of economic security, must be supported by process control.

Thus, the company’s economic security should be ensured, first of all, due to the effective internal structure and organization of the company’s activities. That means, that along with protective measures implemented by the enterprise, it must protect itself on the basis of high productivity.

In determining the level of economic security, it is necessary to introduce the concept of “Threshold value of the indicator of the component of economic security”. This is the significance in which the level of economic security of an industrial enterprise changes in one of the components of economic security Depending on the value of the deviation of the indicator of the component of economic security, according to experts from its threshold value, the level of economic security of an industrial enterprise is proposed to be characterized as:

a) normal - when the actual values of all the indicators of the components of economic security are between the threshold values and values equal to 1;

b) pre-crisis - when the actual values of two or three indicators of the components of economic security become less than their threshold values;

c) crisis - when the actual value of the most indicators of the components of economic security becomes less than their threshold values;

d) critical - when all (or almost all) actual values of indicators for the components of economic security become less than their thresholds (Fjord Trends, 2019).
It is important to emphasize that the highest degree of security is achieved thanks to the fact that the whole set of indicators is within the limits of their thresholds, and the threshold values of one indicator are achieved not to the detriment of others. Therefore, it can be concluded that outside the threshold values, the enterprise loses its ability to dynamic self-development, competitiveness and, consequently, is doomed to financial failure and bankruptcy.

Continuous reduction of the level of economic security can be carried out systematically, taking into account: the maximum permissible level of reduction of economic activity, volume of production, investment and financing, as well as increase of efficiency of economic activity and further development on the technical level, innovation, investment, personnel and qualification potential.

Conclusions

It was proved that the process approach in its traditional sense is inappropriate for managing strategic economic security, since resources are no less important as a necessary condition for the implementation of various processes, those who carry out work between the “input” and the “exit” of the process, and also counterparties, who can stop the process.

The expediency of synthesis process (impact of business processes existing in the enterprise on the economic security of enterprises) and cyclic approach, which allows to identify threats in the context of the determinants of enterprise security on the micro level (business processes and resources), were determined.

The structural model for ensuring the strategic economic security of the enterprise was proposed. It discloses the content of the process done by the providing subject for the object thanks to the implementation of a set of directions and measures formed on the basis of monitoring the threats and assessing the level of security. The structural model is applicable on various levels of detailing from the upper level of description of the basic categories of economic security management to the level of designing analytical applications, and can describe various aspects of strategic security - from the system of strategies and goals to the organizational structure and business processes. In the system, as components of strategic economic security at enterprises, there are an object that is at risk, factors that threaten the safety of the object, the subject that provides security.

References


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ENSURING COMPLEX SECURITY OF THE FINANCIAL FLOWS MOVEMENT IN THE NATIONAL ECONOMY SYSTEM

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Abstract. The individual principles of the cyclical course of economic processes in modern economic conditions were considered. The existing theories of economic (business) cycles were analyzed. The financial economy was defined as a component of the security of financial flows. The factors of strengthening (weakening) of the interaction of financial flows in the economy and their safe movement support were characterized. The effect of multiplication of financial flows for individual stages of the economic cycle was disclosed. The specifics of complex security of the movement of financial flows in industrial and financial economies were studied. A comparative characteristic of industrial and financial economies was carried out according to a number of criteria.

Keywords: security of the financial flows movement, financial flow, industrial economy, financial economy, development, economic cycle, financial sector, real sector


JEL Classifications: F52, O39

1. Introduction

The modern economic environment is characterized by a high level of uncertainty of processes, an increase in the number and quality of crises, an increase in the volume of «soap bubbles» and especially significant consequences of their «collapses» for the security of financial flows movement in economic systems. The gradual transformation of the crisis into an economic one, although it does not resemble a succession of a major economic depression, in fact, has similar consequences. Recessionary processes slowly cover the whole world - from countries with a lower level of economic development to highly developed ones. China remains a successful exception to the crisis, although its economy also shows a slowdown in economic growth (Tvaronavičienė, 2019a, 2019b). In general, the crisis processes determined the need to consider the issue of economic security and the development trends of national economies for decades to come. The need for timely prevention of the described crisis phenomena determines the relevance of more detailed studies of the fundamentals of the financial flows movement by types of economies.

The works of many well-known scientists, such as Amicelle, 2011; Best, 2017; Bodie, et. al. 2005; de Goede, 2017; Gilbert, 2017; McCloskey, 2016; Hilkevics, Hilkevica, 2017; Masood et al., 2019 are devoted to the theoretical and practical fundamentals of the study of the financial flows movement and their security in economic systems.
However, certain principles of such a movement, taking into account the peculiarities of modern economic development and deployment of processes for initiating the security of the financial flows movement are still insufficiently studied and require further scientific study. The subject of this study is the mechanism of cyclical economic processes, which manifests itself through the appropriate interaction of financial flows in industrial and financial economies.

The purpose of the article is to study the specifics of the financial flows movement in industrial and financial economies by conducting a comparative analysis on a number of characteristic criteria of these economies.

2. Literature Survey

The considerations by economists of the mechanism of the occurrence and existence of economic processes, taking into account cyclicality and security, have been formed over a long period of time. The theory of cycles was developed by economist M. Kondratiev, who empirically established the presence of large waves of the economic conditions of capitalist countries. M. Kondratiev analyzed the dynamics of changes in various macroeconomic indicators in countries such as England, France, Germany, and the United States from the end of the 18th century to the beginning of the 20th. After processing the data, M. Kondratiev detect the presence of fluctuation cycles of the parameters studied for a duration of 48-55 years. Despite the fact that the period under consideration (140 years) is quite short by historical standards (only 2.5 waves of a large cycle), M. Kondratiev concluded that there is a high probability of the existence of large cycles of economic conditions. Crises associated with changes in technology accompany the entire history of mankind and can be viewed as a general civilizational regularity. Based on his observations, M. Kondratiev made a long-term forecast until 2010, including, in particular, the Great Depression of the 1930s (Bodie, et. al. 2005).

The well-known scientist S. Kuznets, based on extensive empirical study, revealed the existence of long-term (approximately 22 years) fluctuations in the dynamics of production and prices, which confirmed the existence of economic cycles (Fabozzi, et. al. 2002).

The development of the theory of economic cycles created a new dichotomy between economic theories, given the need to explain both large cycles (which was possible within the dialectical approach) and minor fluctuations of the economy (which required the development of a systems approach). Therefore, in the beginning of the 1980s, in connection with the creation of a theory of real business cycles, a shift in research focus is observed from the analysis of growth processes to the analysis of the fluctuation behavior of economic activity. Similarly to the fact that long-term growth is explained by exogenous factors in the model of R. Solow, short-term fluctuations in studies of theorists of real business cycles are also explained by exogenous factors. Although the canonical model of real business cycles concerns only the analysis of fluctuations, which are interpreted as the optimal responses (feedbacks) of business entities to exogenous real shocks, the long-term dynamics of economic growth remain neglected. Schumpeter’s view of business cycles (especially recessions) as a mechanism for reducing (or eliminating) organizational imperfections or inefficient allocation of production factors found its recovery in the works of (Delas, et. al. 2015; Hall, and Soskice, 2001). Thus, endogenous and exogenous factors are partially combined in explaining the existence of cycles. The significance of exogenous factors in cyclic processes is displayed in the works of (Elton, et. al. 2003; Massumi, 2014).

However, exogenous and endogenous factors are taken separately from each other, that is associated with the efficiency of the national economy. The legitimacy of the traditional division of macroeconomic theory into trend and cyclical components was called into question in the 80s when work on real business cycles appeared (Arnold, 2004), in which it was noted that productivity shocks are the main driving force of cyclical fluctuations. This became the basis for the revival of the Schumpeter’s point of view on growth and cycles as a single economic phenomenon. The main group of models explaining economic fluctuations is based on the assumption of non-equilibrium dynamics of individual elements of economic systems, representing a systemic perception of economic processes (Dalevska et al., 2019).
3. Methods

The approach of the theory of real business cycles is very close to determining the causal relationships between the growth of productivity of production factors and economic fluctuations, and their influence and the security of financial flows. In particular, in the model of R. Goodwin (Bodie, et. Al. 2005) there are economic fluctuations that were modeled as deterministic accompaniment of the process of economic growth, or rather, variations in income distribution (between salary and profit), which are the result of the growth process. Using the stochastic version of economic growth, emphasizing real productivity shocks as perhaps the only source of economic fluctuations to explain the pro-cyclical behavior of consumption and employment, using the balance of R. Solow in order to measure variations in the use of capital and labor during periods of business cycles, the creators of the theory of real business cycles worked their way to for the next turning point in study of growth and macroeconomic fluctuations. Such a turning point, indeed, took place when scientists independently modeled the presence of an endogenous trend in the theory of real (or monetary) business cycles Since the endogenous nature of the trend of cycles was not explained by the non-equilibrium dynamics of the elements of the system, the systematic approach was not fully adequate in this case.

4. Results

The following growth models or business cycles get rid of the assumption of non-equilibrium, but nevertheless avoid explaining the complex problem of the relationships between the growth trend and business cycles. This concerns both the well-known growth model of R. Solow and the later versions of this model before the appearance of endogenous growth studies, in which, as before, the long-term trend was the result of either population growth or exogenous technical progress. Thus, there is a dichotomy between theories of growth and theories of cycles (Naudé, & Szirmai, (2013). The fact is that, both in growth studies and fluctuation studies, macroeconomic time series were considered stationary for a long time, which meant that the economic system could not deviate permanently from its equilibrium growth trajectory after exposure to one or another shock; such deviations were considered temporary. However, the work (Sachs, 2016) on the stochastic nature of the main macroeconomic indicators, with its conclusion that temporary shocks can have a permanent impact on the long-term dynamics of economic processes, revealed an urgent need to reform the existing relationships between growth and fluctuations and provide these relationships into clear status of integration.

A reflection of the dualistic perception of economic processes are also contradictions in the characteristics of the causes of economic cycles, representatives of the theory of real economic cycles and the new Keynesian theory. The theory of real economic cycles is characterized by the following scientific works: (Bottazzi, et. al. 2008; Brealey, et. al. 2007; Corman, et. al. 2012b). Scientists (Delas, et. Al. 2015; Haugen, (2001) remaining on the fundamental positions of Keynesianism, concentrate efforts on microeconomic phenomena. Considering that the emergence of the economic cycle is caused by demand shocks, these scientists try to find out which factors prevent firms from quickly adapting to changes in the situation and restoring equilibrium. Also, the “new Keynesians” insist that the balance concepts of F. Cüdland and V. Prescott cannot explain the reasons for significant recessions. Another source of non-equilibrium in the models of «new Keynesians» is limited access to information, as evidenced by the works of (Huber, et. al. 2010; Langley, 2015; Laster, et. al. 2016; Rudman, 2013). The same can be said about other models of business cycles that have been formed in the framework of market equilibrium or obvious non-linearities in inter-hour preferences; However, none of these models gave a clear picture of the existence of a trend in its relation (possibly causal) to fluctuations. The driving forces of cyclical nature are so diverse that their concentrated embodiment is almost impossible. One of the main aspects of the manifestation of the cyclical nature of economic processes is, in our opinion, the cyclical nature of the movement and interactions of financial flows; it manifests itself in the most concentrated way through the differences in the cyclic nature of the industrial and financial economy (Dobrovolskienė et al., 2017; Isatayeva et al., 2019).
The determining factor in strengthening/weakening of the interaction of financial flows is their structuring and multiplication (Drobyazko S., 2017; Drobyazko S., Hryhoruk I., Pavlova H., Volchanska V., Sergiychuk S., 2019). The prerequisites for increase in money supply are included in the institutional mechanisms for its regulation. However, the material basis of social production is the basis for the formation of value added, and then determines the volume of money supply. In the industrial economy, the real sector dominates the financial one, the material basis of social production is broad, which determines the high level of match of the commodity and money supply (Fig. 1).

The multiplication effect at the growth stage contributes to the fact that the money supply grows at a higher rate than the commodity, which determines its direction to the financial sector. The financial sector at the growth stage controls an increasing share of financial flows, respectively, through control over financial flows, it strengthens control over the real sector — the processes of convergence of the financial and real sectors become the basis of structural changes in the economy. However, at this stage, the multiplication effect is not so significant that it can lead to the formation of turbulent financial flows. On the contrary, their fluctuations mutually compensate each other, which makes it possible to use financial instruments to diversify minor turbulences of financial flows. In general, at this stage financial flows are laminar.

At the plateau stage, when the growth of the commodity mass is insignificant, the monetary mass continues to grow through lag, the amount of financial resources becomes redundant, which leads to a
Fig. 1. Specifics of movement and violation of security of the financial flows movement in the industrial economy

Source: Designed by the authors
Fig. 2. Specifics of movement and violation of security of the financial flows existence in the financial economy

Source: Designed by the authors
decrease in the speed of movement of financial flows and inflation. These effects are widely described in the scientific literature. The redistribution of free financial resources towards the financial sector due to a decrease in the efficiency of operations in the real sector causes a slowdown in the convergence of the financial and real sectors. At the same time, due to the slowdown in the movement of financial flows, their interaction intensifies, which determines an increase in turbulence. The diversification effect becomes ineffective in compensating for random fluctuations of financial flows, financial instruments contribute to the multiplication of money supply, increasing the level of uncertainty in financial processes. At the end of this stage, the dichotomy of development trends is possible (Amadae, 2018).

First, the likelihood of significant sources of turbulence in financial flows through institutional factors, external influences, leakage of insider information, and the like becomes high. These effects become the obstacle in the movement of financial flows, even in their laminar state can cause significant turbulence. In a condition where there is always a very significant impact of sources of uncertainty, such effects may be systemic. However, since the main financial flows circulate in the financial sector, first of all, systemic violations occur in this sector, and only then induced to the real sector, convertible from financial (Tvaronavičienė, 2019a).

Secondly, without the occurrence of obstacles in moderately turbulent financial flows, a slow and then ever-increasing decrease in the volume of financial resources begins first due to a decrease in multiplication amid rising inflation and a rise in the cost of resources. The main factor in the depth of the recession in this case is the duration of the lag and the effectiveness of the monetary mechanism. Due to the decrease in the volume of financial resources, the convergence of the financial and real sectors stops and can be transformed into a divergence. Again, the main factor is that in the industrial economy, the real sector is a source of added value. Since financial flows in the sector are predominantly laminar, sources of turbulence are minimized (Wit, and Meyer 2005).

Significant differences have regularities in the movement of financial flows in the so-called “financial economy” (Fig. 2), the distinctive feature of which is the proportional ratio of the real and financial sectors or the domination of the financial sector over the real.

In a rapidly changing economic environment, tough competition, financial sector entities should not only focus on the state of affairs of their internal environment, but also develop a long-term financial management strategy that would allow them to adapt to the changes taking place in their environment. The issues of improving the system of strategic planning in the activities of domestic entities of the financial sector are of particular importance. Management of a financial sector entity involves the efficient formation and use of financial resources in relevant areas of activity. At the same time, the issues of financial resources management within the achievement of the strategic objectives of the individual subjects of the financial sector are relevant - expanding the coverage of the market field of activity, ensuring the balance of the financial services portfolio, improving the quality of financial products offered on the market. Therefore, strategic financial decisions of financial sector entities should be formed from the standpoint of the integrated interaction of the external market and internal organizational environment of each of these entities.

Financial flows of financial sector entities, which are defined as input and output, are interdependent on the stages of the life cycle of the market products of these entities (Table 1).

At the same time, a consistent change in the stages of introduction, growth, maturity and recession determines the competitive position of the financial sector entity in the market.
Table 1. Main financial flows of financial sector entities

<table>
<thead>
<tr>
<th>Entities</th>
<th>Introduction</th>
<th>Growth</th>
<th>Maturity</th>
<th>Recession</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input flows</td>
<td>Investments in authorized capital; Insufficient amount of initial contributions at the conclusion of transactions</td>
<td>Initial contributions; Investment income; Revenues from the results of risk redistribution; Revenues from financial transactions</td>
<td>Financial contributions; Investment income; Revenues from the results of risk redistribution; Revenues from financial transactions</td>
<td>Financial contributions; Investment income; Revenues from financial transactions</td>
</tr>
<tr>
<td>Output flows</td>
<td>High advertising costs; Agent network financing; Contract preparation costs; Remuneration of employees of the financial sector entity; Deductions to the special fund of financial resources</td>
<td>Financing damage; Remuneration of financial intermediaries; Costs of maintaining (implementing) contracts; Expenses for the redistribution of risks; Remuneration of employees of the financial sector entity; Investments; Deductions to the special fund of financial resources</td>
<td>High marketing costs; Financing damage; Remuneration of financial intermediaries; Costs of maintaining (implementing) contracts; Expenses for the redistribution of risks; Remuneration of employees of the financial sector entity; Investments; Deductions to the special fund of financial resources</td>
<td>High sales support costs; Financing damage; Remuneration of financial intermediaries; Costs of maintaining (implementing) contracts; Expenses for the redistribution of risks; Remuneration of employees of the financial sector entity; Investments; Deductions to the special fund of financial resources</td>
</tr>
</tbody>
</table>

Source: Jaconetti, et. al. (2016); World Economic Forum (2018).

The level of performance of financial resources management of a financial sector entity is an assessment of the degree of achievement of strategic goals and tactical tasks of the formation and use of financial resources according to indicators of socially significant, final and immediate results (Nanto, 2011). Performance evaluation is formed by the correlation of strategic goals and tactical tasks of managing financial resources within the financial operations of the studied entity of financial sector and the results obtained by it.

5. Discussion

The level of performance of financial resources management of a financial sector entity is determined in stages. At the first stage, the main types of financial products are determined. At the second stage, the strategic goals and tactical tasks of the formation and use of financial resources are set. At the third stage, a list of financial transactions of the financial sector entity is formed within the limits of the outlined goals and objectives. The fourth stage is characterized by the formation of a system of indicators for the relevant financial transactions and their values. At the fifth stage, the nature of the effect of indicators is determined: direct or reverse. At the sixth stage, the deviations of the values of the indicators for the direct effect and / or for the reverse effect are determined. At the seventh stage, the scores of indicators are formed on the basis of calculations of their deviations by values (unit of deviation of the indicator value corresponds to the unit of scoring). At the eighth stage, experts determine the shares of the indicators depending on their significance within the limits of the previously defined goals and tasks (the sum of the shares of the indicators for the goals and tasks within one financial product is 1) (King’s College London (2017)). At the ninth stage, indices of the result are calculated by indicators by multiplying the scores of the indicators by their respective shares. At the tenth stage, the indices of the result for all financial transactions (the sum of the indices of the result by the indicators in the context of individual transactions) and the final index of the result (the sum of all the indices of the result for the operations) are calculated (Wei, 2015). The strategic goal, tactical tasks, socially significant, final and immediate indicators of the effectiveness of the formation and use of financial resources of the financial sector entities within a number of financial transactions are presented in Table 2.
Table 2. Components of strategic management to ensure the effectiveness of the formation and use of financial resources of the financial sector entities of the national economy

<table>
<thead>
<tr>
<th>Strategic goal</th>
<th>Socially significant indicators</th>
<th>Tactical tasks</th>
<th>Entity transactions</th>
<th>Immediate indicators</th>
<th>Final indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ensuring the effective management of financial resources of the financial sector entities and the effective implementation of financial products</td>
<td>Margin of entity solvency; Adequacy of special funds of resources; Liquidity of assets and balance of financial services portfolio</td>
<td>Expansion of activity field coverage</td>
<td>Insurance transactions</td>
<td>Volume of bonuses; Volume of payments; Amount of reserves; Number of contracts concluded; Income from operating activities</td>
<td>Profitability of transactions; Ratio of the amount of bonuses and reserves</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Optimization of return from investment</td>
<td>Investment transactions</td>
<td>Volume of investments; Investment income; Number of investment fields</td>
<td>Efficiency of investment transactions; Investment return level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Increase in financial potential of financial sector entities</td>
<td>Financial Transactions</td>
<td>Equity capital; Net assets; Income from financial activities</td>
<td>Return on equity; Ratio of equity and liabilities; Ratio of current and non-current capital</td>
</tr>
</tbody>
</table>

Source: Standard and Poor’s (2007); UN Security Council (2017).

The competitive advantage of the financial services portfolio of financial sector entities can be characterized by a set of the following indicators: size of the price; separate rules of activity; number of new financial products; term of activity; scope of responsibility of entities and others. The level of development of the financial sector can be characterized by a set of the following indicators: number of types of financial services, development of risk redistribution mechanisms, world market situation, availability of government programs to stimulate the development of innovative types of financial services, etc. The stability of the economic conditions in a country can be characterized by a set of the following indicators: effective demand, tax system, types of alternative sources of financing, the state of individual segments of the financial market, inflation and interest rates, nature of the liability, etc. (Wallick, et. al. 2012).

Each of the presented indicators can be estimated in the range from 1 to 10. On the basis of the obtained values of the indicators, the average statistical evaluation of the criterion is derived (Langenohl, 2017; Yan, 2012). After that, all the resulting average values of the criteria are entered into a special scheme of distribution of market forces.

The consequence of differences in the mechanism of cyclicality is a significant difference between industrial and financial economies with their characteristic properties (Table 3).

Table 3. Comparative characteristics of industrial and financial economies in the framework of economic security

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Industrial economy</th>
<th>Financial economy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topology of financial space</td>
<td>Does not change within the cycle and during the transition from cycle to cycle</td>
<td>Does not change within one cycle, changes during a system crisis</td>
</tr>
<tr>
<td>Ratio of real and financial sectors</td>
<td>The real sector in terms of financial resources significantly exceeds the financial one</td>
<td>The real sector and the financial sector even out in terms of financial resources, the financial sector begins to dominate</td>
</tr>
<tr>
<td>Features of the movement of financial flows</td>
<td>The patterns of movement of financial flows within the financial and real sectors are specific, containing constant characteristics, fluctuations in financial flows within the real sector are insignificant.</td>
<td>Fluctuations of financial flows within the financial and real sectors acquire the same characteristics, the patterns of movement lose their specificity</td>
</tr>
<tr>
<td>Convergence of the financial and real sectors</td>
<td>Insignificant, intensified in before transformational periods</td>
<td>Significant, uniform</td>
</tr>
<tr>
<td>Local crises</td>
<td>Episodic, the number increases before systemic crises</td>
<td>Constant, the frequency of crises does not increase in the period before systemic crises</td>
</tr>
</tbody>
</table>

Source: Designed by the authors
Therefore, the financial and industrial economy is characterized by a constantly excessive amount of financial resources, determines the constant turbulence of its financial flows and the formation of the danger of their movement. If the formation of «soap bubbles» is not characteristic for the industrial economy, then for the financial economy an increase in their number and volume is commonplace at the plateau stage or the recession stage. Moreover, since the «soap bubbles» are part of the mechanism of recovery of laminarity, their formation may occur and occur at other stages of the economic cycle. The very course of cyclical phenomena in financial economics is changing.

Conclusions

It has been determined that cyclic processes in the real sector are leveled, while in financial ones they are intensified and sharpened. Given the hyper development of the financial sector, its convergence with the real sector is constantly significant. It should also be noted that the formation of «soap bubbles» supports the possibility of a dichotomy of economic development at any stage of the cycle. At the same time, the effectiveness of financial decisions of this financial sector entity is determined by the achievement of the strategic goal, tactical tasks, socially significant, immediate and final indicators of the effectiveness of the formation and use of financial resources.

So, the article considered certain provisions of the cyclical course of economic processes and analyzed the existing theories of economic cycles and the accounting of safety factors for the movement of financial flows. The financial economy was also defined as a stage of economic development, factors of strengthening (weakening) of interaction of financial flows in the economy were characterized, the specifics of the movement of financial flows in industrial and financial economies were studied. At the end of the study, a comparative characteristic of industrial and financial economies was carried out according to a number of characteristic criteria. Thus, the patterns of the flow of modern financial crises make it possible to form a hypothesis about the existence of a relationship between the characteristics of the circulation of financial resources, the structural relationship between the real and financial sectors and the frequency and depth of recessionary phenomena.

References


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ASSESMENT OF SUSTAINABLE ECONOMIC DEVELOPMENT FACETS: PECULIARITIES OF FAMILY BUSINESSES SIZE IN SELECTED ECONOMIES

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Abstract. Family businesses are identified in many instances as small-scale entities. However, among family businesse, there are many huge corporations, and many of the world’s best-known brands are classified as being family orientated. They generate large revenues, which play a very important role in the global economy. In Poland, several examples of well-known brands belonging to families can be found, such as Mokate, Comarch and Farmacol. The aim of the article is to present selected large Polish family businesses against the background of some of the largest family businesses globally and to determine the difference between them. The research followed an empirical approach and is based on the analysis of secondary data sources, such as Ernst & Young Family Business Yearbook report series from 2015-2017, the Global Family Business Index ranking, and studies on Polish family businesses. The analyses confirmed that many of the global largest enterprises are indeed family businesses. The importance of family businesses in the economy is evident by the fact that in 2015, enterprises from the Global Family Business Index generated revenues higher than the GDP of most countries in the world. None of the large Polish family businesses have yet found their place in the analysed ranking, but also, in Poland, family businesses play a significant role, and some of them generate revenues of several billion dollars. Familism does not prevent enterprises from achieving a significant position in the market the largest family businesses in the world play such a strong role that their success or failure may affect the condition of the entire economy. Polish family businesses are not yet included in this group, but they are constantly growing. It can, therefore, be anticipated that in a few years, Polish family businesses will have a good representation in the Global Family Business Index and will help to ensure sustainable development of the Polish economy.

Keywords: sustainable development; family business characteristics, family business, family company, global family business, sustainable development, Poland


JEL Classification: H12, H56, K14, K32

1. Introduction

Sustainable economic development of any country depends on viability and overall performance of business companies (e.g. Kuzmin et al., 2019; Havriemiková, Kordoš, 2019; Kowo et al., 2019; Suvittawat, A. 2019, etc.). Despite the fact that the number of family businesses and their share in the overall structure of enterprises is still the subject of many debates, the significance of these entities in the economy has already not raised doubts for some time. Their share in the creation of GDP and employment is widely emphasized (Patel et. al.,
2012; Abdellatif et. al., 2010) and researchers increasingly pay attention to different aspects of the operation of family businesses which, on the one hand, have a lot of characteristics in common and, on the other, are characterized by great diversity. Most family businesses are entities belonging to the SME sector; however, in the modern economy, there are examples of large family businesses employing thousands of workers, whose revenues amount to billions of dollars. Although a family business is still quite often associated with a small entity, in fact, many of the most well-known global brands belong to families. The best example is the Wal-Mart company which has been in the top three of the Fortune Global 500 ranking, presenting the largest companies in the world, since 2000.

Moreover, it has occupied the first position in 13 editions of this ranking (Fortune, 2018b). Family businesses amount to about 1/3 of the companies of this ranking (Javetski et al., 2014) and, in its latest edition (of 2018), in the top ten, there were three family businesses: Wal-Mart (1st position), Volkswagen (7th position) and Berkshire Hathaway (10th position) (Fortune, 2018a). Also, in the Fortune 500 ranking, presenting the largest companies in the USA, family businesses play a significant role – 35% of all the entities are estimated to be in the hands of families (GrantThornton, 2018).

Also, in Poland, many of the largest companies belong to families. Admittedly, one will not find the leaders of the 200 Largest Polish Companies ranking by the “Wprost” (polish weekly magazine) among them, however, this due to the fact that the top twenty of the ranking was dominated by state actors. However, in further positions, there are well-known family business representatives (Wprost, 2018).

Undoubtedly, the presence of many family businesses on the lists of the Fortune Global 500 and Fortune 500 proves that family businesses can operate as large entities. Therefore, they may strongly affect the economy. Also, in Poland, there are large, widely recognized family businesses, although, undoubtedly, they still operate on a smaller scale than the world giants. The objective of this paper is to present selected large Polish family businesses against the background of the world’s largest family businesses and to make an attempt to determine the distance between them. The subsequent part of the paper is organized as follows: the literature review, research methodology, research results, and final conclusions.

2. The literature review

Family business is the oldest form of entrepreneurship. It has been the focus of interests of the world scientific communities more less since the 1970s and, in the last two decades, the number of publications devoted to this topic has significantly increased (Sageder et al., 2018; Chrisman et al., 2016). Despite several decades of research, scientists have failed to develop a single approach to the issues related to family businesses and to create a universal, worldwide accepted definition. As pointed out by Mandl (2008), in Europe itself, there are about 90 different definitions; therefore, their standardization would not be an easy task. One of the most widely accepted and quoted definitions of this issue is a classic American definition, according to which the family business has “any legal form, the capital of the company is located in whole or in part in the hands of the family, and at least one family member exercises decisive influence on the management or holds a managerial position themselves with the intention to maintain the venture in the hands of the family” (Frishkoff, 1995). In the stream of the market research, the most popular is the definition by PricewaterhouseCoopers (PwC), saying that the family business is the entity in which the family has at least a 51% share, family members are the majority of board members and owners are involved in the daily management in the company (Surdej & Wach, 2010). However, in the case of the companies listed in the stock exchange, family businesses are often considered as the ones in which the family has more than a 20% share (Liu et al., 2015; Leung et al., 2014). The diversity of definitions brings about that it becomes necessary to order and group them to some extent. One of the ways is to highlight the factors which are emphasized in individual definitions. Cano-Rubio et.al. (2017) distinguish definitions based on one factor (self-perception; ownership; family involvement in business), two (self-perception and ownership; self-perception and management; self-perception and control; self-perception and family involvement; ownership and continuity; ownership and management; ownership and involvement), three (self-perception, ownership and management; ownership, continuity and manage-
ment) or more (self-perception, ownership, management and continuity; ownership, management, involve-
ment and continuity) factors.

Despite different definitional approaches, there is general agreement that what distinguishes the family busi-
ness is the interdependence and cooperation of three main components: family, business, and ownership (Ta-
giuri & Davis, 1996). This, in turn, equips these entities with specific characteristics affecting their operation
(Bednarz et al., 2017). The most frequently mentioned characteristics of family businesses include: striving for
sovereignty and independence; striving to maintain the continuity of ownership and to carry out a generational
change; a specific system of property relations; close connection between management and the owners’ fam-
ily; shaping the image of a family business through the family ownership system; the need to consider specific
ownership and family goals; the impact of family conflicts on the functioning and development of the company;
tendency to ossification of organizational structures, especially in the case of long-term management of the
company by the owner (Safin, 2007).

The extensive catalogue of characteristics of family businesses is also presented in the studies by Maloni et
al. (2016) or Jeżak et. al. (2004). Unfortunately, due to the frequent identification of family businesses with
micro- and small enterprises, family businesses are often characterized in terms of these two groups of entities
and, in many cases, they do not correspond with large family businesses. However, there is a large group of
characteristics which describe well the operation of both small and large entities. These, among others, are the
propensity to “re-invest in themselves”, resistance to the temptation to obtain short-term benefits, relatively
high resistance to the recession, strong strategic orientation and constant concern for the quality of products and
services resulting from the relationship between the company and the family name (Jeżak, 2014).

3. Research methodology

The research is based on secondary sources. The first one is the Global Family Business Index ranking, which
provides the data on 500 largest family businesses in the world. The ranking was created by the specialists from
the Centre for Family Business operating at the University of St. Gallen in Switzerland and from EY’s Global
Family Business Centre of Excellence. The ranking was based on the data for 2015. However, the enterprises
for which there were no reliable data, were not included in it. Family businesses were found private entities in
which the family has more than 50% of votes and public companies listed on the stock exchange in which the
family has at least 32% of votes.

On the other hand, the research concerning the significance of family businesses for the economy was based
on the data from the reports by EY Family Business Yearbook for years 2015-2017. Each of the reports pre-
sents the information related to the period two years before; therefore, the analyses will refer to the period of

Yet, the information concerning Polish family businesses come from the ranking made by the portal - money.
Pl and the websites of the largest family enterprises (i.e., Grupa AB, Neuca, Farmacol, Unimot, Komputronik,
and so on – see table 4). The data collected in this way relate to the year of establishment, the owner’s family,
presence on the stock exchange and revenues and allowed to compare Polish family businesses with selected
companies from the Global Family Business Index ranking.
4. Results and discussion

4.1. Family businesses in the global, regional and national economies

Many family businesses are listed on the stock exchange. About 1/3 of the American S&P 500 Index companies is family businesses (Ali et al., 2007), the situation is similar in China (Nikodemska-Wołowik et al., 2017). The report developed by Credit Suisse indicates that half of more than 3500 listed companies from the 10 largest Asian economies are controlled by families (Ghosh, 2018). In the countries of Western Europe, nearly 45% of the listed companies are family businesses (Surdej & Wach, 2010). In Germany, among the companies listed on the Frankfurt Stock Exchange, half of them are family businesses, in France; their percentage is even higher and amounts to about 57% (Marjański, 2013). On the Warsaw Stock Exchange, at the end of 2016, there were listed 176 family businesses, which amounted to nearly 20% of all the entities (GrantThornton, 2018).

The above data clearly indicate that family businesses, including large entities, play an important role in the contemporary economy and helps to ensure sustainable development. This is noticed by the specialists from the Centre for Family Business operating at the University of St. Gallen in Switzerland and from EY’s Global Family Business Centre of Excellence who, already for a few years, have been preparing the rankings of the world’s largest family businesses. The Global Family Business Index, since this is the name of the ranking, indicates that, in 2015, the 500 largest family businesses generated the revenues of 6 792.3 billion USD and employed 24.85 million workers. If they were considered as a single economy, they would occupy the 3rd position (only following the USA and China). They also play a very important role in the economy of individual regions, as shown in Table 1.

Table 1. The values of the selected indicators characterizing the 500 largest family businesses in the world in individual regions.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2013</td>
</tr>
<tr>
<td><strong>Europe</strong></td>
<td></td>
</tr>
<tr>
<td>Number of companies</td>
<td>243</td>
</tr>
<tr>
<td>Value of production (billion USD)</td>
<td>2 890</td>
</tr>
<tr>
<td>Share in GDP (%)</td>
<td>13,2</td>
</tr>
<tr>
<td><strong>North America</strong></td>
<td></td>
</tr>
<tr>
<td>Number of companies</td>
<td>120</td>
</tr>
<tr>
<td>Value of production (billion USD)</td>
<td>2 300</td>
</tr>
<tr>
<td>Share in GDP (%)</td>
<td>12,4</td>
</tr>
<tr>
<td><strong>Latin America</strong></td>
<td></td>
</tr>
<tr>
<td>Number of companies</td>
<td>36</td>
</tr>
<tr>
<td>Value of production (billion USD)</td>
<td>466</td>
</tr>
<tr>
<td>Share in GDP (%)</td>
<td>7,7</td>
</tr>
<tr>
<td><strong>Asia-Pacific</strong></td>
<td></td>
</tr>
<tr>
<td>Number of companies</td>
<td>85</td>
</tr>
<tr>
<td>Value of production (billion USD)</td>
<td>743</td>
</tr>
<tr>
<td>Share in GDP (%)</td>
<td>4,3</td>
</tr>
</tbody>
</table>

*Source: own study based on: Ernst & Young, 2015; 2016; 2017.*
When considering the number of the world’s largest family businesses from the perspective of individual regions, it can be observed that, in the whole period, most of them were in Europe and the smallest number in Latin America. However, it should be added that the share of European companies has been falling each year, whereas in 2015 there was recorded a significant increase in their number in North America. In the other two analysed geographical areas, their share was stable with a slight upward trend.

When analysing the data included in Table 1, it is worth pinpointing the share of family businesses in the creation of GDP. This indicator is the highest in Europe, which should not be surprising since there is the majority of the analysed family businesses. Both in Europe and North America, this share amounts to more than 10%, which should be considered as a very high result (taking into account the number of companies, it should be concluded that the result of the companies from North America is even more outstanding). The significance of large family businesses for the economy is even better shown by the example of Latin America, where in 2014 only 35 entities were responsible for the creation of 10% of GDP. This is the evidence that the world’s largest family businesses are the strength the authorities of many countries must take into account.

4.2. Characteristics of the largest family businesses in the world

As mentioned above, family businesses can grow to large sizes and become important players on the global market. Table 2 presents selected data on the 10 largest family businesses in the world.

<table>
<thead>
<tr>
<th>Company</th>
<th>Family</th>
<th>Founding year</th>
<th>Public/Private</th>
<th>Revenue (USD b)</th>
<th>Employees (ths.)</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wal-Mart Stores</td>
<td>Walton</td>
<td>1962</td>
<td>public</td>
<td>485,7</td>
<td>2200,000</td>
<td>USA</td>
</tr>
<tr>
<td>Volkswagen</td>
<td>Porsche &amp; Piech</td>
<td>1937</td>
<td>public</td>
<td>231,7</td>
<td>591,425</td>
<td>Germany</td>
</tr>
<tr>
<td>Berkshire Hathaway</td>
<td>Buffett</td>
<td>1955</td>
<td>public</td>
<td>199,9</td>
<td>36,127</td>
<td>USA</td>
</tr>
<tr>
<td>Ford Motor Company</td>
<td>Ford</td>
<td>1903</td>
<td>public</td>
<td>149,6</td>
<td>199,000</td>
<td>USA</td>
</tr>
<tr>
<td>EXOR</td>
<td>Agnelli</td>
<td>1927</td>
<td>public</td>
<td>148,1</td>
<td>303,247</td>
<td>Italy</td>
</tr>
<tr>
<td>Cargill</td>
<td>Cargill</td>
<td>1865</td>
<td>private</td>
<td>120,4</td>
<td>153,000</td>
<td>USA</td>
</tr>
<tr>
<td>BMW</td>
<td>Quandt</td>
<td>1916</td>
<td>public</td>
<td>100,1</td>
<td>122,244</td>
<td>Germany</td>
</tr>
<tr>
<td>Koch Industries</td>
<td>Koch</td>
<td>1940</td>
<td>private</td>
<td>100,0</td>
<td>100,000</td>
<td>USA</td>
</tr>
<tr>
<td>Schwarz Group</td>
<td>Schwarz</td>
<td>1930</td>
<td>private</td>
<td>93,1</td>
<td>360,000</td>
<td>Germany</td>
</tr>
<tr>
<td>ALDI Group</td>
<td>Albrecht</td>
<td>1913</td>
<td>private</td>
<td>82,2</td>
<td>162,579</td>
<td>Germany</td>
</tr>
</tbody>
</table>

Source: own study based on: The Global Family Business Index, 2017

The top ten of the world’s largest family businesses is dominated by the entities from the United States and Germany. The only representative of another country is EXOR, whose owner-family comes from Italy. The clear leader in the ranking of the world’s largest family businesses is Wal-Mart, which in 2015 generated the revenues of nearly 486 billion USD, which was the result of more than twice better than in the case of Volkswagen, which was the second in this ranking. Also, in terms of employment, Wal-Mart is significantly ahead of its competitors since they employ almost four times more workers than Volkswagen. Having in mind, however, that Wal-Mart is the leader of the Global Fortune 500 ranking, these data should not be particularly surprising.

The analysis of the 10 largest family businesses in the world shows that these entities are characterized by rather significant discrepancies (among others, in terms of founding time or the level of employment). The situation is similar in the case of all 500 entities included in the Global Family Business Index, which is presented in Figure 1 and Table 3.
Fig. 1. The selected characteristics of the 500 largest family businesses in the world

Source: own study based on: The Global Family Business Index, 2017

**Founding time.** A vast majority of the companies included in the ranking of the Global Family Business Index were established in the 20th century (they amount to over 76% of the total number of the entities). The companies whose origins date back to the 19th century is also quite numerously represented (nearly 20% of all the companies). Interestingly, in the ranking, there were also two companies founded in the 17th century, i.e. the ones which may boast of a really long history. This means that the enterprises are able to successfully handle the problems associated with succession and, in this respect, can be a role model for others. On the other hand, the presence of 13 entities established in the 21st century in the ranking, thus being less than 20 years old, indicates that family business can acquire the status of very large companies in a short time, generating profits counted in billions USD.

**Stock exchange.** In terms of the presence on the stock exchange, the structure of the world’s largest family businesses is balanced. It should be added that among the enterprises which have decided on going public so far, as much as 72% are the entities being completely in the hands of the family (the family has a 100% share). Among the companies listed on the stock exchange, in the case of more than 60% of the entities, the family has the majority of shares (over 50% of votes). This shows that the world’s largest family businesses are very strongly related to the owner-families, which only marginally allow external shareholders. Even if companies go public, families attempt to maintain a significant part of ownership in their hands.

**Revenues and employment.** A vast majority of the enterprises from the Global Family Business Index ranking generated revenues of less than 10 billion USD in 2015. Only 4% of the companies generated the revenues of more 50 billion USD, which means that they constitute the group of clear leaders of the ranking. Furthermore, smaller companies are able to grow constantly, thus ensuring sustainable development. In the case of the level of employment, there is much larger balance among the largest companies. The most numerous groups are the entities employing from 5001 to 10000 workers, whereas the least numerous group is the companies with the employment of less than 1000 people.
Table 3. The selected characteristics of the 500 largest family businesses in the world

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Max. value</th>
<th>Min. value</th>
<th>Average value</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>408</td>
<td>11</td>
<td>-</td>
<td>71</td>
</tr>
<tr>
<td>Employment</td>
<td>2200000</td>
<td>226</td>
<td>47.692</td>
<td>22.317</td>
</tr>
<tr>
<td>Revenues (billion USD)</td>
<td>485.7</td>
<td>3.1</td>
<td>13.6</td>
<td>6.4</td>
</tr>
<tr>
<td>Revenues per 1 employee (thousand USD)</td>
<td>42666.67</td>
<td>26.57</td>
<td>881.07</td>
<td>304.83</td>
</tr>
</tbody>
</table>

*Source: own study based on: The Global Family Business Index, 2017.*

The data included in Table 3 confirm very large differences between the companies generating the highest and the lowest values of the selected characteristics. In the case of age, the difference between the oldest and the youngest company is 397 years. This indicates that the group of the largest family businesses may include both very young (only 11 years old) and mature, multi-generational (408 years old) entities. It should be noted that the median of age is 71 years, which means that half of the world’s largest family businesses had been founded before 1947. Thus they are multi-generational companies. Also, the analysis of the other three characteristics (revenues, employment, and revenues per 1 employee) shows a significant diversity among the enterprises included in the Global Family Business Index. Also, in this case, it is worth paying attention to the median and also the average value. In all the cases, the average value is much higher than the median, which means that most enterprises are characterized by the values considerably, lower than the arithmetic average. This is due to the fact that the enterprises generating the largest revenues significantly go ahead of other entities.

4.3. Characteristic of largest Polish family businesses

In Table 4, there are presented the data concerning the 10 largest Polish family businesses.

Table 4. The 10 largest Polish family businesses in 2016

<table>
<thead>
<tr>
<th>Company</th>
<th>Family</th>
<th>Founding year</th>
<th>Public/ private</th>
<th>Revenue (USD b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grupa AB</td>
<td>Przybyło</td>
<td>1990</td>
<td>public</td>
<td>2,17</td>
</tr>
<tr>
<td>Neuca</td>
<td>Herba</td>
<td>1990</td>
<td>public</td>
<td>1,88</td>
</tr>
<tr>
<td>Farmacol</td>
<td>Olszewscy</td>
<td>1990</td>
<td>public</td>
<td>1,61</td>
</tr>
<tr>
<td>Unimot</td>
<td>Sikorscy</td>
<td>1992</td>
<td>public</td>
<td>0,67</td>
</tr>
<tr>
<td>Komputronik</td>
<td>Buczkowscy</td>
<td>1996</td>
<td>public</td>
<td>0,56</td>
</tr>
<tr>
<td>PBG</td>
<td>Wiśniewscy</td>
<td>1994</td>
<td>public</td>
<td>0,50</td>
</tr>
<tr>
<td>Wipasz</td>
<td>Wiśniewski</td>
<td>1994</td>
<td>private</td>
<td>0,47</td>
</tr>
<tr>
<td>Fermny Drobiu Woźniak</td>
<td>Woźniak</td>
<td>1986</td>
<td>private</td>
<td>0,46</td>
</tr>
<tr>
<td>Black Red White</td>
<td>Chmiel</td>
<td>1991</td>
<td>private</td>
<td>0,46</td>
</tr>
<tr>
<td>Solaris</td>
<td>Olszewscy</td>
<td>1996</td>
<td>private</td>
<td>0,45</td>
</tr>
</tbody>
</table>

*Note: revenues translated from PLN into USD at the average exchange rate of 3.75*  

*Source: own study based on: Stanek, 2017*

The history of only one out of the 10 largest Polish family businesses dates back to the times before the political transformation, which took place in 1989. The others were founded in the 1990s, mainly as a result of the aforementioned transformation and market liberalization. These enterprises operate in various industries: among them, among others, there are the representatives of pharmacy (Neuca, Farmacol), distribution (Grupa AB), furniture industry (Black Red White), fuel industry (Unimot) or widely understood agricultural production (Fermny Drobiu Woźniak, Wipasz). This indicates that family businesses may exist, succeed practically, and ensure sustainable development in each sector of the Polish economy. Interestingly, all the three largest
polish family companies were established in 1990, (i.e., at the very beginning of the political transformation). It seems, however, that it is a rather accidental coincidence. It is worth pinpointing that, as in the case of the world’s largest family businesses, going public is not necessary to achieve success although undoubtedly it provides new opportunities since the fact that the leaders of both rankings have decided to go public seems to be important.

In the case of the largest Polish family businesses, it can be observed that there is a high disproportion between the revenues of the top three companies of the ranking and the other entities included in it. The situation is similar to the case of companies from the Global Family Business Index ranking, where the leader Wal-Mart stands out definitely (although the revenues of Volkswagen and Berkshire Hathaway are also definitely higher than the other companies in the ranking), however, as data shows, both smaller and larger family companies are able to grow sustainably

4.4. Comparison of the largest Polish family businesses with selected companies from the Global Family Business Index ranking

The companies classified in the Global Family Business Index ranking come from 48 countries. However, there are no representatives of the Polish family business among them. Therefore, it is worth comparing the largest Polish family businesses with selected companies included in this ranking and find out how big the distance between these two groups is. For comparison, the companies that occupy the last five places in the Global Family Business Index ranking have been selected.

![Table 5. The 10 largest Polish family businesses in 2016](image)

The clear leader of Polish companies is Grupa AB, whose revenues exceeded 2 billion USD. They are by about 1 billion USD too low to be included in the Global Family Business Index ranking but it seems that, over the next few or several years, this company has the best chance to enter the aforementioned ranking. Also, Neuca and Farmacol may hope for that. However, they need slightly more to achieve this target. It is worth noting that two of the companies from the Global Family Business Index ranking were founded later than Polish leaders, which means that the year of founding does not play a significant role. This argument cannot, therefore, explain the lack of representatives of the Polish economy in this ranking. One should, therefore, consider the real reasons for this state of affairs, which may be an interesting topic for future research.
5. Conclusion

Family businesses are the focus of the growing interest; however, it is still possible to identify many research gaps. One of them is the characteristics of family entrepreneurship from the point of view of large entities since, in the subject literature, there dominate the approaches focused on micro- and small entities which, despite possessing many characteristics in common with large family businesses, significantly differ from them. This can be seen clearly on the example of characteristics of family businesses which very well reflect the specificity of smaller entities but do not necessarily relate to the largest entities. Meanwhile, large family businesses may boast of great significance for the economy, especially in terms of sustainability. Therefore, it is worth analysing them in a little more extensive manner.

The world’s largest family businesses classified in the ranking of the Global Family Business Index are characterized by a large diversity in terms of the amount of revenues, employment, operating time or share in public trading, however, most importantly, they play a very important role in the economy. Only two countries: the USA and China generate a higher value of GDP than the 500 largest family businesses in total, which certainly is an outstanding result. Also, in individual regions of the world, the entities being in the hands of families are of great importance. In Europe and Latin America, in 2014, which was the year of recession, the largest family businesses increased their GDP share, which means that they can handle problems better than other enterprises. All of this brings about that the entities from the ranking of the Global Family Business Index are important players in the world market.

The largest Polish family businesses still cannot boast of such great importance since they have no representative in the aforementioned ranking. The distance between them and the leaders of the Global Family Business Index is enormous; however, the same can be stated in relation to the entities occupying the final positions of the ranking. The difference in revenues between the largest Polish family businesses and the entities closing the aforementioned ranking is significantly smaller, and it seems quite real to mitigate. This allows for hoping that, in the next few or several years, at least one representative of the Polish family business will enter this prestigious group.

The analysis of the distance of the largest Polish family businesses conducted in this paper is burdened with a few constraints. Firstly, there is certain incompatibility of the research periods since, in the case of the entities from the ranking of the Global Family Business Index, the data concerning revenues come from 2015, whereas, in the case of the Polish companies, they relate to 2016. Secondly, the definitional grounds determining the business as the family one is different. Finally, thirdly, the revenues of Polish family businesses are counted in zloty. Therefore, it was necessary to translate them into USD, which may result in exchange rate differences and to some extent impedes the comparative analysis. This analysis is merely the contribution to further research and indicates its interesting direction. In the future, it would be worth expanding at least the issues related to employment (due to lack of reliable data concerning employment in Polish enterprises, it was impossible to compare this aspect in the present paper), market share or the scale of foreign expansion and, most of all, the analysis of changes taking place over a few years. Another interesting direction of the research can be the comparison of the largest family businesses from a few countries, e.g. from Central and Eastern Europe, which would allow for indicating how the Polish family business operates against the background of similar businesses conducted in the countries of the former socialist bloc. In view of the fact that the largest world and Polish family companies are listed companies, it is also worth investigating whether this is coincidence or whether there are some dependencies in this aspect.
References


Ernst&Young. 2015. *Family Business Yearbook*.

Ernst&Young. 2016. *Family Business Yearbook*.

Ernst&Young. 2017. *Family Business Yearbook*.


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BEHAVIORAL MODELS FOR ENSURING THE SECURITY OF FUNCTIONING AND ORGANIZATIONAL SUSTAINABILITY OF THE ENTERPRISE

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Abstract. In the scientific work, the factors of perception of management styles have been studied in order to ensure the security of functioning of the enterprise in the context of the transformation of the social system when implementing strategies aimed at its development. The paradigm of decision making on interference in functional processes has been studied for ensuring the security and organizational sustainability of the enterprise. The main components of the formation of corporate models of sustainability and security of enterprise development have been considered and classified.

Keywords: ensuring security, organizational sustainability of the enterprise, behavioral model, management styles, staff of the enterprise, adjustment effects, society


JEL Classifications: F52, O39

1. Introduction

The management style and behavioral processes are one of the effective factors of influence on the overall efficiency of the enterprise. In today’s conditions, when on the basis of using information technologies and perfect telecommunication equipment, a significant progress has been made in the implementation of management as a continuous cyclical process, the most significant reserves of efficiency increase are associated with the behavioral features for ensuring the security of functioning and organizational sustainability of the enterprise, which together form a specific style of managerial influence. That is why a large number of studies have been devoted to the problem of adaptation and improvement of management styles in order to maintain the security of the enterprise. In particular, there are systems’ studies of Bartol, Tein et. al. 2003; Bushe, et. al. 2009; Cao, and McHugh, 2005; Srivastva, and Cooperrider, 1999; Worley, et. al. 1996; Zucker, 1987; Bombiak, 2019; Koval et. al., 2019; Ključnikov et al., 2019; Hasanudin et al., 2019.

At the same time, there is a lack of detailed consideration of issues both relating to the management style with the limits of perception and demand for the safe and even growth of the enterprise in these studies. Indeed, the management style (strictly speaking, the unity of the management style within a particular enterprise is meant) makes directly an influence on the psychological climate of the enterprise, the employee engagement level of the enterprise in the implementation of tactical and strategic goals and objectives. Therefore, the enterprise
should formulate forward-looking plans for improving the management style, adapting to strategic tasks, ensuring unity of style at the enterprise, transforming the management style into an important element of organizational security of the enterprise (Monni et al., 2017).

The purpose of scientific work is both determination and organizational interaction of using behavioral models for ensuring the security of functioning and organizational sustainability of the enterprise.

2. Literature Survey

It is clear that the management style, which characterizes the behavioral features of one of the staff groups (human resources), belongs to the internal variables of the enterprise that are under the control of the management. However, the behavioral features of people are a function of the individual, the formation process of which is determined by the dynamics of social structure, the typology of social characters and the orientation to different groups of values. Moreover, the perception of a certain management style and the orientation (expectation) of a separate type of management by the enterprise staff are also determined by the eastern set of external socio-political factors. Thus, the transformation of the behavioral features of people is the most effective factor that makes an influence on the attraction to certain behavioral profiles and both open and hidden attitude to the behavioral features of the management functions Zeman, et. al. (2018).

Thus, external factors not only affect, but also directly determine certain parameters of such an important internal variable as different elements of the staff structure of the enterprise and the relationship between employees (Drobyazko S., 2017). The latter circumstance is very important in the sense that the task of working out this influence at the enterprise level is very complicated due to the need to take into account the complex effects of mutual adjustment of various elements of the staff structure. Such elements may lead to internal contradictions and, as a consequence, to additional barriers to the way of implementing the enterprise strategy. At the same time, the possibility of controlling these variables from the enterprise is very limited, that is, even if there is a moderate promising policy of the enterprise regarding the development of individual structural elements of the staff, the possibility of ensuring positive changes in the efficiency of activities is not guaranteed (Zhou, et. al. 2017).

3. Methods

The latter provision necessitates a detailed study of the effects of perceptions of management styles in order to ensure the security of functioning of the enterprise in the context of the transformation of the social system against the background of implementing the strategy aimed at its development, ensuring its competitiveness in the globalized world economy.

From these considerations, the tasks of this study are:
- determination of value systems, towards which the typology of managers and employees of the enterprise is separately directed;
- identification of the transformation effects of public values both in the behavior of managers and the attitude of enterprise staff to the behavioral features of the management functions;
- formation of perspective recommendations on adaptation and development of management styles and adaptation to the development process of the motivational structure of the enterprise staff at the stage of entering the world economic system.

In order to solve the first problem, it is necessary to determine the features of the transformation of the public value system, on which the staff and management of the enterprise are oriented. As a rule, in societies that exist under stable conditions, the values to which the staff and management of the enterprise are oriented coincide. However, with respect to societies in a state of transformation of the social system, one can put forward the hypothesis that the permissible values differ in that the process the reorientation to a new value system for management is more rapid than for the enterprise staff.
4. Results

The issue of ensuring organizational stability and security of development in a competitive struggle and determining the moment of reorganization of activities in order to ensure competitiveness are vital for the achievement of a dynamic enterprise development. Both of these directions directly relate to the release of the effect of non-material factors of ensuring competitiveness (Drobyazko S., 2019).

Accumulation of the mismatch of the current organizational state of the enterprise, namely, its set of internal and external variables is an objective process that can be completed through a series of crisis stages of development, when the competitiveness of the enterprise suddenly decreases not only due to the influence of external but also internal factors. A controlled change in organizational status makes it possible to minimize the negative impact (and if possible, exclude such an impact).

The behavior of the enterprise and security are determined by the subject of its management, while the choice of the development path under conditions of chaos, according to (Mathis, 2011), is purely random: “At this turning point (which is called the bifurcation point) it is fundamentally impossible to predict in what direction further development will take place; whether the state of the system becomes chaotic or it moves to a new, more differentiated and higher level of ordering.” This distinction gives the subject of management the opportunity to use the interpretation of the unstable state of the enterprise as a tool for choosing the right solution that does not allow the disintegration of the system.

The second difference is the capability of the organization to overcome serious deviations, asymmetry of reactions, organizational hysteresis, leaving the enterprise at the same time in a state of functioning.

For the enterprise it is a rather slow transition from the unstable state at the bifurcation point to the equilibrium state of the transformed system or, conversely, to the state of the organizational crisis. External influences on the activity of the enterprise may lead to a temporary change in its organizational parameters, however, after their termination, the organization may well return to its former state. At the same time, we observe that because of the influence of various factors, the organization moved from one state to another.

Let us give examples:
– once a unitary enterprise has become corporate one;
– the former workshop has become a separate enterprise;
– the operation of a certain technological equipment has ceased;
– the previously existing technological specialization of the site has changed to the subject;
– directions of traffic flow have changed;
– the need for workers of a certain profession and qualification has disappeared, etc.

The capability of ensuring the organizational sustainability of enterprises largely depends on timely knowledge of future critical points, namely, of bifurcations. Researchers note the features of the behavior of the system, according to which this critical point approaches (Cummins, and Worley, 2005; Makedon, et. al. 2019a). These are:
– the presence of several different (stable and unstable) states, of which the system is displayed by weak “shocks”;
– irreversibility (impossibility to return to the previous conditions);
– the presence of a delay in the reaction to changes in the system, which manifests itself in the phenomena of organizational hysteresis, etc.

Thus, the organizational stability of the enterprise’s activity should be understood as its capability to adjust or change its organizational state in order to counteract the end of the organizational crisis and ensure its functioning. Accordingly, the measure of organizational sustainability should be measured by the size of resources at the disposal of enterprises that are able to move the onset of an organizational crisis for a certain period, or not to allow it at all through using resources for the reorganization of activities at the time of the bifurcation point.
The activity of the enterprise takes place in market conditions, the rate of change of which becomes almost unpredictable, and why the suddenness with which the global economic crisis has captured most countries, industries and individual enterprises has become a misconception. In these conditions, all functions of modern management are filled up with a new content, including the need for its implementation in the form of organizational behavior of the enterprise in relation to the organization’s function, the main task of which is to provide a certain level of organizational sustainability (Kubeš, and Rančák, 2018).

Unfortunately, the negative experience of many enterprises in the process of growing crisis and attempts to overcome it shows that they lack not only the capability to find the necessary solutions, but also the presence of the system of activities aimed at ensuring the stability of the enterprise in changing conditions. The requirement to ensure organizational sustainability formulates the following paradigm for decision-making on interference with an operating organization (Table 1).

Gray background with an increase in its depth in the table 3.6 refers to the inactive relation of the subject of management to the accumulation of negative consequences of the influence of environmental variability on the organization of activity, which inevitably leads to an organizational crisis.

On the contrary, in the case of decision-making on the reorganization of activity according to the changed environmental conditions, it is necessary (Jankelová, et. al. 2018; Mason, 2007):

1) to monitor the external environment and the position of the enterprise in the part of the change of organizational relations 11 with other elements of the environment, which is crucial for the continuation of functioning of the enterprise. In the case of detecting a certain direction of the volatility of the environment, it is necessary to select its concentrated parameter and establish the point of beginning of volatility;

2) to measure variables of the environment and enterprise activity;

3) to evaluate of the level of organizational sustainability of the enterprise, admission to further change of pa-

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Source: Hamel, and Zanini, 2014; Marshak, and Grant, 2008.
rameters, as well as the establishment of the bifurcation point, that is, the extreme state of return indicators, the further deterioration of which makes it impossible to prevent the state of the organizational crisis;
4) to implement the measures in order to support the organizational sustainability of the enterprise at a certain level;
5) to evaluate the onset of the organizational bifurcation point.

One of the most complex things, both theoretical and practical, is the question of choosing the moment of the necessary transition from the active form to the new one, that is, the timely recognition of the future critical bits of bifurcation. The capability of ensuring organizational sustainability of enterprises directly depends on it (Aghina, et. al. 2014).

According to the determination of the point of organizational bifurcation, an unlimited level of organizational sustainability of the enterprise can accumulate, but the very moment of the onset of the bifurcation point depends on the expected onset of an organizational crisis.

The development of a market economy, even with elements of state capitalism in strategically important areas of activity, leads to an increase in the influence of corporations on society. Essential assistance in implementing such a process could be provided by specially developed models of corporate behavior (Načisčionis, et. al. 2018). These models do not need to be invented; they exist in the real practice of companies, they only need to be highlighted and described as sustainable socio-psychological features of the behavior of companies and their constituent individuals.

Let us consider two main components of corporate sustainability and security models for the enterprise: social responsibility and education index. Using them as variables, we can plot the compliance matrix presented in Fig. 1. It makes it possible to distinguish five main models of corporate behavior. Theoretically, the alternatives are possible, but the below models are more common.

![Fig.1. Compliance matrix of forming corporate models of sustainability and security](Source: Cameron, and Quinn, 2011; Limba, and Šidlauskas, 2018)

1. **The model of “intensive promotion”** represents such behavior of the enterprise, which manifests itself in attracting to its activities the most accessible number of emerging opportunities. At the same time, both different external areas of activity and internal characteristics of the enterprise are included among the opportunities. External circumstances include the possibility of diversification, concentration on certain segments up to the monopolization of the market niche, different types of strategies for vertical integration. Internal circumstances consist in using the smallest opportunities for internal development of the company, including training and
other types of personnel development (Korauš, & Kelemen 2018). The result of such an organization’s management behavior is “concentrated development”, which can be represented by the diagram presented in Fig. 2.

![Diagram of organization’s “concentrated development”](source: Designed by the authors)

The influence of such a behavioral model on the society can be described through an analysis of the organization’s influence on the development of society. Indicator at the initial stage of development can be the return magnitude on each member of society. This indicator differs from the usual return characteristics for each employee. The return on each member of the society can be represented as a derivative (converted from the ratio of infinitesimal values): \[\frac{dP}{dF}\], where \(P\) is the level of total return (in fact, GDP), and \(F\) is the number of members of society. The derivative \(\frac{dP}{dF}\) is the average return value of the population of society, including through the creation of a creative, positive atmosphere in society (Page, et. al. 2012).

It manifests itself in three aspects of the activities of each organization. The first of these, “external opportunities”, can be described by linear dependence on time, because for a developing company, over time, their accumulation is taking place.

As an example, let us consider one of the manufacturing companies, which, having started work more than ten years ago from one plant, is today a holding company with eleven lines. The dependence has the form of \(k_1 \sqrt{t}\), where \(k_1\) is the dimensional coefficient, \(t\) is the current time. For the example given, \(k_1 = 0.917\). The second aspect of activity, “internal development”, is associated with many factors. One of the most significant, explicit and easily controlled aspects is the training of staff, and especially of managers. Here, the linear dependence on time with form of \(k_2 \sqrt{t}\) is also the most reasonable, where \(k_2\) is the dimensional coefficient, \(t\) is the current time. In our example, \(k_2 = 0.6\). Synergistic effects can be represented by a stronger dependence, which should include both listed dependences, and at least one degree of dependence on time \(t\) should be added. Then the real dependence will have the form of \(k_3 t \sqrt{t}\). However, there is a complexity with the determination of the magnitude of \(k_3\) in the considered example; it has become possible to control the progress of leading specialists of one of the key departments of the enterprise at a controlled time, which resulted in an estimate equal to 0.2 (Smith, et. al. 2014). The parallel effect of these aspects of the organization’s work can be taken into account by summing up their inverse values, and the equation describing the behavior of the organization will look like:

\[
\frac{dP}{dF} = Ak_1 k_2 k_3 t \sqrt{t} [k_3 t + (k_1 + k_2)]
\] (1)
After integration, one obtains:

\[ P_t = 0.286 g A k_1 k_2 k_3^2 (t^2 \sqrt{\tau} + 1) + 0.25 g A k_1 k_2 k_3 (k_1 + k_2) (t \sqrt{\tau} + 1) \]  

(2)

where \( g \) is a dimensional proportionality factor;
\( t \) is the current time.

From the expression (2), we can see that this behavior of the enterprise, which includes corporate or joint training, makes most likely a growing contribution to the development of society. From this, it follows that the training and (or) advertising and marketing activities, the development of strategies should be focused on the formation of the latter from the considered models of company behavior.

2. **The model of “cautious sensing”** represents such a form of behavior of the enterprise, which is implemented in case of careful thought and clarification of all aspects of the decision. Schematically, the activity of such an organization is shown in Fig. 3.

1) to measure variables of the environment and enterprise activity;
2) to evaluate of the level of organizational sustainability of the enterprise, admission to further change of parameters, as well as the establishment of the bifurcation point, that is, the extreme state of return indicators, the further deterioration of which makes it impossible to prevent the state of the organizational crisis;
3) to implement the measures in order to support the organizational sustainability of the enterprise at a certain level;
4) to evaluate the onset of the organizational bifurcation point.

\[ \frac{dV}{dF} = \eta \frac{dP}{dF} + Z \]

(3)

In order to move to the time variable \( t \), it is necessary to consider that members of society participate in its activities, investing in working time, and therefore the contribution of people ultimately determined by how much time these people have invested in the work for the benefit of society. Then we can write that \( F = gt \), where \( g \) is still a dimensional coefficient of proportionality, and \( t \) is the current time.

![Fig. 3. Scheme of organization’s functioning on the model of “cautious sensing”](Source: Designed by the authors)
After integrating and transforming in the light of the last circumstance:

\[ P_2 = \frac{V_\xi}{\eta} - \frac{Zg_t}{\eta} \]  

(4)

Thus, despite all the caution of the organization, the positive effects of its activities for society over time are reduced. Probably the reason for this is quite a lot, but most likely, one of the most obvious and significant reasons may be the lack of developmental concerns.

3. Unfortunately, the model of “blind enrichment” is still widespread. Its feature is that the organization uses any provided opportunities not for development but for enrichment, therefore the activity of such an organization harms the society (Fig. 4).

![Diagram](source: Designed by the authors)

The behavior of the enterprise in this case is described by a negative production function. Then the specific return is equal to the negative production function. If we adopt the approach of Cobb–Douglas production function known from the literature (Matthews, 2015), it is necessary to introduce the normalization factors \( \omega \) (which is the degree of processing of input resources) and \( \chi \) which reflects the use of human resources. Then:

\[ \frac{dP}{dF} = - \frac{dW}{dF} = -\omega \chi \exp(0.0294t)G^{0.397}L^{0.768} \]  

(5)

The boundary condition can be considered \( P|_{t=0} = 0 \), because, of course, those who follow this model begin with a certain estimate of \( N \), trying to “get out into people”. Based on this:

\[ P_3 = N - \omega \chi \exp(0.0294t)G^{0.397}L^{0.768} \]  

(6)

From formula (6), we can see that the contribution of such an organization, even if neglected by influence on other indicators, falls. There are no driving forces that could push such an enterprise to civilized activities, within which programs for the development of personnel with inevitable elements of training could be considered.

4. The “resource-based” model. The essence of enterprise behavior by such a model is simple and understandable. Having access to resources, the organization converts them to demand for material income, profit, etc., affecting society in two ways (Fig. 5).
The first of them manifests itself through taxes, rent payments, the second one manifests itself through using extracted resources in society, which increases the turnover of the economy and, accordingly, leads to an increase in national wealth. However, if the first way of influencing has some delay in influencing the society within the fiscal year, the delay of the second may be very large, and in some cases, infinitely large and never realized (Korsakienė, et. al. 2017).

Resources have an unpleasant feature. They have a habit of exhaustion, and if their disappearance “to the last drop” does not occur, then the availability of resources becomes more difficult, and the costs of their receipt are growing rapidly. This position can be described by the exponential \( \exp(-mt) \), where \( m \) is the dimensional coefficient. On the other hand, the demand is described by the well-known S-shaped curve and the degree indicator in the expression for it is better to choose equal to 2. Then the expression for demand \( 1 - \exp(-t/b) \) will make it possible using the dimensional coefficients \( a_i \) and \( a_j \) to obtain the value of the possible material flow \( M = a_i \left[ 1 - \exp(-t/b) \right] - a_j \exp(-mt) \). The tax influence on society is determined as a function of the material flow by the expression \( \gamma M \exp[m_1(t-\tau)] \). In this expression, \( \gamma \) represents the effective value of the “tax burden”, \( \tau \) is the level of late payment of taxes, and the entire exponent reflects the latency calculation. Adding due to the influence of the processing of resources on society will look like \( \lambda \left[ 1 - \exp\left(\frac{t^2}{b}\right) \right] \exp[m_2(t-\theta)] \). Here \( \lambda \) is the share of the influence on society of these processes, \( \theta \), as before, is the delay level of the indicated influence. Then we can get the equation:

\[
\frac{dp}{df} = -\gamma m_1(t-\tau) \left\{ a_1 \left[ 1 - \exp\left(\frac{t^2}{b}\right) \right] - a_2 \exp(-mt) \right\} + \\
+ \lambda \left[ 1 - 2\exp\left(\frac{t^2}{b}\right) \right] \exp[m_2(t-\theta)] 
\]  

(7)

After integration, one obtains:

\[
\begin{align*}
P_s &= -g \frac{\gamma a_1}{m_1} \exp \tau \exp(m_1 \tau) + 2g \frac{\gamma a_1}{m_1} \exp \tau \exp \left[b \exp(m_1 \tau) \exp\left(\frac{t^2}{b}\right)\right] - \\
&- \frac{\gamma a_1}{m_1} \exp \tau \exp[(m_1 + m_2) \tau] + \frac{\lambda}{m_2} \exp[m_2(t-\tau)] + \\
&+ 2g \frac{\gamma}{b m_2} \exp[m_2(t-\tau)] \exp\left(\frac{t^2}{b}\right) - g \exp\left(\frac{t^2}{b}\right) \times \\
&\times \left\{ 2g \frac{\gamma a_1}{m_1} \exp \tau \exp[b \exp(m_1 \tau) + \frac{\gamma}{b m_2} \exp[m_2(t-\tau)] \right\} 
\end{align*}
\]

(8)

From expression (8), it is clear that after the integration, the general nature of the dependence will not change and the contribution to the development of society appears as a function of the depletion of the source.
5. The model of “standard functioning”. This model is a reflection of the usual practice in human society. The company converts resources and opportunities, and then they are put at the disposal of the society (David, & David, 2016). Derivative $dP/dF$ in this case is a function of the degree of processing and (or) processing of input resources and opportunities (Fig.6).

Fig.6. Scheme for implementation of the model of “standard functioning”

Source: Designed by the authors

A special case of this dependence is a linear dependence, then $dP/dF = \omega \frac{S_{input}}{M_{output}}$. This ratio is a production function adopted in the economy. One of the most demonstrative production functions, as already noted, is the Cobb–Douglas function: $W = 1.038e^{0.0294t}G^{0.397}L^{0.768}$, where $G$ is the amount of fixed capital used; $L$ is the cost of living labor.

Then:

$$\frac{dP}{dF} = \omega \exp(0.0294t)G^{0.397}L^{0.768}$$ (9)

In addition, one has to introduce the coefficient $g$, representing the return on the company’s own promotional activities, rather than inheriting. This means that in fact this coefficient reflects the level of attention to development, mainly to study. The model shows a slight increase in the influence of the organization, but it is rather weak and also demonstrates the importance of learning in order to increase the organization’s contribution to the development of society.

$$P_5 = 34g\omega \exp(0.0294t)G^{0.397}L^{0.768}$$ (10)

The comparison of models of corporate behavior should be conducted under the same conditions. For this purpose, constant coefficients have been determined for a group of organizations of a close profile (Fig. 7). The coefficients for the studied case are: $V=0.2; \tilde{v}=1; \eta=0.1; Z=0.1; g=0.1; \gamma=0.05; m=0.1; m_1=0.1; m_2=0.1; a_1=0.1; b=0.5; a_2=0.1; \lambda=0.12; \Gamma=0.2; \omega=0.1; A=1; N=0.14; G=0.2; L=0.2$.

The obtained result is presented in Fig. 7, from which it is clear that the models of “cautious sensing” and “blind enrichment” show a steady decline (the first model is probably due to the weak use of all opportunities, the second one is due to the exhaustion of these opportunities at the expense of “predatory” exploitation). “Resource-based” model initially gives a rapid growth, and then the same rapid drop, and in the interval of time, which approximately corresponds to 0.35 of all the interval described.

5. Discussion

The reason is probably that originally this organization is gaining market of raw materials and there is a constant increase in opportunities. Then it turns out that the organization achieved much more at first level, and then it cannot further give other interesting offers, so that interest in it falls. Moreover, the further is the process of extraction of minerals, the more “deaf”, hard-to-reach, dear arrays of these fossils have to be mastered; the profitability of the company is falling, and with a lack of resources, the returns are reduced. A stable, but small increase is given by the model of “standard functioning”, which, obviously, is a reflection of an established
system of interaction with suppliers and consumers, as well as with society as a whole. The fastest growth is given by the option of “intensive promotion”, probably with reaching the plateau outside the reporting period, that is, beyond the limits of this model.

The correlation of the return rates in Fig.7 shows that such a diagram is appropriate for choosing the organization’s development strategy, correlating the real opportunities with those estimates of development trends that can be made on the basis of data. However, the extremes are implemented rarely in development, and managers can use both parallel and consistent application of the above models (Kabát, et. al. 2017). In this case, the strategy of the organization’s development will represent a pre-selected combination of the above-mentioned variants of the behavior of the enterprise, which makes it possible to formalize the process of strategic management of the organization and, accordingly, to facilitate strategic planning and to reduce the likelihood of strategic mistakes that are very dangerous for the organization.

The analysis of modeling results undeniably indicates that the most effective scenario is the intensive promotion; certain growth and security of the enterprise’s development are provided by the resource-based scenario, while the scenarios of concentrated development, cautious sensing and blind enrichment give a clearly negative result, because almost do not use intangible reserves.

Conclusions

It has been established that temporal mathematical model of the intensification of using non-material reserves in order to increase the competitiveness of the enterprise, taking into account the level of remuneration indices of the perception of motivational incentives, the perception of enterprise employees of management features, the dynamics of changes in global and local social values, and different scenarios of using intangible reserves can quantitatively determine the effect of using these reserves according to the chosen scenario of development.
and security of enterprise’s functioning. Using calculations conducted using the model, it has been determined that the most effective scenario is an intensive promotion scenario based on using positive trends in changing public values in order to ensure maximum perceptions of the most effective management styles. The resource-based resource scenario has a certain potential of ensuring the competitiveness of the enterprise. Scenarios of cautious sensing and blind enrichment are negative in terms of ensuring the competitiveness of the enterprise, because these scenarios do not use intangible internal reserves.

References


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INFRASTRUCTURE SECURITY OF FORMATION AND DEVELOPMENT OF SECTORAL CORPORATE CLUSTERS

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Abstract. The article is devoted to the problems of formation and development of sectoral corporate clusters and the infrastructure security of their formation and development in the system of the national economy. The role of the innovation infrastructure in the development of the national economy was determined, and a model was proposed for transferring the innovative product from the developer to the real economy. The main components of the production and infrastructure security of business entities when deploying an innovative business development model were outlined.

Keywords: infrastructure security, development security, innovative product, innovative infrastructure, national economy, innovative economy, sectoral corporate cluster


JEL Classifications: F52, O39

1. Introduction

An innovation-type economy requires the creation of effective mechanisms for the security of industrial development in order to increase the overall innovation activity of sectors. In the world theory and practice of organizing territorial socio-economic development, there are many directions and concepts. The choice of specific provisions depends on the circumstances and factors affecting the national economy and its security parameters. If a country is in a crisis situation, then its economic potential is not enough to support the dynamic rates of development of all spheres at the same time. A fundamental choice of critical directions is needed, which should be emphasized to achieve the most positive effect. This specificity is most consistent with the corporate cluster approach to the formation of innovative policy and the security of business development. The cluster principle of the existence of sectors in the national economy can also become a rational tool to increase the innovation activity of industry within the economic system. The principle that is proposed, provides for the concentration of state resources in order to support not individual enterprises in the context of sector, but sectoral corporate clusters as a whole.
2. Literature Survey

The issues of innovative management and the development of the innovative strategy of the national economy are quite widely represented in the works of such famous scientists as Agarwal, et al. 2017; Brem and Freitag, 2015; Chaminade, et al. 2018; Cunningham, 2014; Dobele, et al. 2015; Felt, et al. 2016; Hartley, 2015; Liu and Shi, 2017; Mansell, 2012; van Djick et al. 2018; Von Hippel, 2005. But at the same time, the issue of corporate clusters formation, in order to develop innovative products and immediately transfer them to the real sector of the economy, does not have wide coverage and applied scientific developments. It is these components that are the basis for the study of the use of corporate and sectoral clusters to revive innovative activity in the sectors of the national economy (Monni et al., 2017).

The purpose of the article is to determine the directions of activization of the work of business entities in the direction of developing strategic programs to ensure infrastructure security and the formation of sectoral and corporate clusters for the rapid development of the real sector of the national economy. The change in the economic structure of the national economy, which is accompanied by numerous crisis phenomena in various spheres of social life, put forward the anti-crisis goals of management and development security as the main guideline. The search for ways to enhance innovation and infrastructure security, which should be based on global trends in the post-industrial development of society, is becoming topical. Among the many most acceptable strategies for socio-economic development, two groups can be distinguished: passive or extensive economic development strategies and active economic development strategies.

The first group includes the formation of peculiar system-forming “profit centers” and centers for the formation of sectoral corporate clusters in various sectors, among which metallurgical, energy, coal, machine-building industries, and logging industries can be distinguished. The basic principle on which the state policy should be built to manage the economic proportions in these sectors, is to “not interfere” with the process of system-building and corporate clustering of the economy around “profit centers”. To do this, it is necessary to create an adequate fiscal regime for doing business, as a result the development of these sectors initiates the development of all associated and related industries and, accordingly, the development of high-tech sectors of the national economy (Antanavičius, 2017).

This group of strategies involves a minimum of government spending and a relatively short period of time for implementation. At the same time, a fairly well-functioning economy will be formed, which is achieved through targeted management of a set of sustainable corporate clusters. In this case, corporate clusters are formed around industrial complexes of the extractive sectors, by concentrating relevant production-suppliers and production-consumers and organizing common technological chains between them.

The disadvantage of a group of extensive strategies is the orientation of the country’s economy towards the sale of raw materials and primary processing products and consciously technological dependence of the country on external suppliers of high-tech products and modern equipment. The group of strategies for the active development of the economy is aimed at initiating and increasing the rates of economic growth due to the industries of deep processing and high-tech industries. The main strategic focus is the development and production of competitive products primarily for end users, maximization of value added (Makedon, 2019).

The implementation of this group is much more capital-intensive, since it involves the identification and focus on the whole complex of strategic “profit centers” and corporate clustering centers, and moreover it will require a longer period of time. But the adoption of an intensive development path will make it possible to form an economy with a considerable margin of safety and a variety of strategic “profit centers.” In the long run, a greater variety of successfully functioning sectoral corporate clusters will be achieved (Oganisjana, et. al. 2017; Žižka et al., 2018; Petrenko et al., 2019).

For the formation of an economy that is developing intensively, it is necessary to develop a general concept and form a set of concrete measures for its implementation. Innovative activity is one of the main internal factors
influencing business activity in relation to the enterprise. A business activity should be understood as a set of targeted processes that ensure the pace of economic growth of an organization based on the coordinated development of its components in harmony with the external environment. It should be emphasized that innovative activity is a key factor in the strategic growth of the security level of the infrastructure providing innovative activity, that is, organizations such as innovation and technology centers (ITC).

The following factors that affect the innovative activity and security of business entities should be outlined (Akhter, 2017; Foege, et. al. 2016):

development of innovative processes: scientific, technical, organizational, financial, economic, managerial, personnel;

development of the organizational and technical potential of the enterprise, which covers the main activity, provides the production structures, service units;

product updates, which provides an increase in the level of production readiness for the production of new products and the level of organization for the implementation of innovative projects.

The force of action of these factors is reflected in the magnitude of the indicators traditionally used, which characterize the innovative activity of the enterprise, namely:

share of new products in the total output (update rate);

progressiveness ratio of the technologies used (production, information, organizational, managerial, etc.);

intensity ratio of the development of new products, which characterizes the innovation potential and the level of organizational and technical readiness of the enterprise for the industrial development of new products;

share of innovation costs in total sales.

Thus, the ITC as an element, as a rule, of the university innovation structure is also characterized by a specific type of activity factors - educational activity. This is due to the possibility of using the aggregate potential of ITC in the main direction of both the creation of new innovative products and the activities of the university - educational. The concept of educational activity is to increase the various forms and methods of conducting educational activities using the potential of ITC. Moreover, we mean only those forms and methods that have positively proved themselves in practice. In the end, these types of processes lead to a steady increase in the number of graduates of various forms of education at ITC who have successfully completed training courses and have the knowledge, skills and abilities that meet the staffing needs.

3. Methods

Obviously, the higher the positive trends in the growth of innovative potential and innovative activity of an innovative infrastructure facility are, the less the small innovative firm needs to spend money on creating its own innovative potential, since the costliest steps of the innovative process will be realized with the potential of the innovative infrastructure facility. In other words, the growth of the innovative potential reduces the barrier to the cumulative necessary investments of a small company in the successful implementation of its own innovative project. In this regard, it is advisable to use ITC, which act as “points of growth” of the innovative economy (Kraus, 2016). Such approach will reduce the cost of implementing innovative strategies for economic development, since it is realistic to recreate the innovative activity of industries by combining human, intellectual and technological potential based on its local corporate clustering around effectively functioning infrastructure facilities. The feasibility of building such an innovative system has been tested by time and international experience.
4. Results

Active innovation activity across the country will be maintained only if the innovations market is constantly updated. This is due to the fact that the capital market and competition of economic entities to one degree or another already exist. However, with the existing potential we cannot say now that we have a large arsenal of competitive and promising innovations. When developing an innovative infrastructure, special attention should be paid to the cultivation and support of research teams aimed at creating “seed” innovative enterprises. This task can be effectively solved only by ITC-type structures that can provide monitoring and assistance to start-up companies in their own region, for example, as is done in Cambridge — which is a leader in the creation of science parks and innovation centers. (Zeschky, et. al. 2011).

In other words, the state, when implementing an innovation strategy, should, first of all, expand the existing ITCs or infrastructure objects similar to them in functional properties, around which, as they develop, clusters of innovations in various industry segments will self-form. Innovation and technology centers are able to effectively perform the role of the core in high-tech sectoral corporate clusters, concentrating all the key competencies that are necessary for the renewal and growth of the innovative activities of the national economy.

The formation and development of sectoral clusters is inextricably connected with the creation of a modern sectoral infrastructure. Currently, there is a gap in the chain of production and industrial development of new knowledge. On the one hand, small business has concentrated in itself the most promising innovations, but is limited in production resources to bring them to the market. On the other hand, the industrial sector has free production capacity, but does not risk investing in those innovations that have not proven their viability in the market, which limits the arsenal of possible products for industrial production (Buse, et. al. 2010).

Thus, within the framework of high-tech sectoral clusters, an experimental infrastructure must be present, through which innovations are prepared for implementation into industrial production. The experimental infrastructure serves as the foundation for the cooperation of small business, education and industry in corporate clusters. Such cooperation solves the problem of the lack of proven innovations in the market at large industry enterprises, significantly reducing the risks of introducing new high-tech products into mass production (Spiesberger, 2018).

Own resources of industrial enterprises are focused on the expansion of production, and the resources of high-tech companies on the development of new types of innovative products. The experimental infrastructure of a corporate cluster is a means for producing small batches of new innovative products, which are subsequently tested on the market and, if successful, transferred to large-scale production (Fig. 1).
In addition, the experimental infrastructure attracts new innovation carriers to the corporate cluster, with which new investors, strategic partners, suppliers of materials, components and related services come. Thus, the experimental infrastructure is the basis for establishing system links in the corporate cluster, which provides an accelerated transfer of intellectual resources to the real economy.

However, each new stage of security and development of the experimental infrastructure of the corporate cluster must be scientifically and economically justified. On the one hand, the lack of infrastructure resources impedes the launch of new innovative projects, and on the other hand, the possible underutilization of infrastructure entails unjustified investments and additional costs. In this regard, the process of a cluster infrastructure formation should be project-oriented. In other words, the experimental infrastructure of the sectoral corporate cluster should primarily be built during the implementation of specific innovation projects and for specific developments. (Davis, et. al. 2009).

Since ITC is the center of attraction for innovation and concentrates the potential for loading the industrial sector, it is advisable to form an experimental infrastructure in its composition (Fig. 2). Moreover, ITC possesses the capabilities for project-oriented filling of the material and technical base of the cluster experimental infrastructure, realizing the package principle of promoting innovative projects.

The performance of the ITC within the cluster is determined by the quality of the internal cluster management. In a cluster, initial prerequisites should be created for establishing a system-oriented interaction between small business entities and industry-oriented scientific and educational institutions. At the same time, the question of not only how to ensure cooperation in a cluster, but also how to create the necessary synergy of intra-cluster interaction, comes to the first place. A cluster is not always an idyllic gathering of enterprises where any update is automatically stimulated. It happens that innovation processes are suppressed in clusters and protective be-
Innovative development can be defined as a set of relations arising in the course of a targeted increase in the economic efficiency and competitiveness of a firm on the basis of innovations. Innovative development is a way that is based on deepening the combination of the goals of the enterprise, its subsystems, the goals of each individual that works in a team, improving its activities, improving business processes with a purpose to achieve common strategic goals (Gulda, et. al. 2016).

The strategy of innovative development of an enterprise can be defined as a set of actions and methods of conducting innovation activity that provides competitive advantages through the development and implementation of innovations. In general, the innovation strategy of an enterprise (strategy of innovation activity) can be described as a certain logical structure, on the basis of which the enterprise solves the main tasks facing it in the innovation sphere of activity. It should be taken into account that both for each innovation, and for each product (service) produced there are strictly individual strategies and tactics. At the same time, a comprehensive vision of the innovation activity of an enterprise includes both specific strategies and various aspects of the production and implementation of innovations. In addition, you should give a realistic assessment of the costs and benefits of innovation in the enterprise.

The general strategic positions of the innovation activity of an enterprise are specified in the innovative development programs, which provide for the development of tactical measures to achieve the goals defined in the innovation strategy of the enterprise. An innovative program is a set of innovative processes and activities agreed upon in terms of resources, performers and timelines for their implementation, which provide an effective solution to the tasks of mastering and spreading fundamentally new types of products or technologies.

Fig. 2. Mechanism of using resources and shaping the security of the existence of cluster members to build a cluster industry infrastructure

Source: Designed by the authors
The model of management of innovative development and security of the enterprise is presented in Figure 3.

This model consists of six blocks, each of which has its own tasks. I want to draw attention to the main tasks. At the first stage of innovative development planning, it is necessary to evaluate the existing innovation position of the company. Management needs to determine the type of strategy to develop a company.

The next stage of innovative development planning. If the strategy of innovative development has not yet been determined, it is assumed that it can be formulated on the basis of internal analysis. However, the best solution would be to create an innovative development strategy based on internal analysis and analysis of environmental factors (Li, and Kozhikode, 2009).

![Fig. 3. Model of management of innovative development and security of the enterprise](Image)

*Source: Designed by the authors*
We will define the above two strategies: cost leadership and quality leadership. Different competitive strategies of leadership are characterized by a different ratio of unit costs and prices of products. In particular, the cost leadership strategy provides for the release of a relatively inexpensive product with low unit costs, and the quality leadership strategy is more expensive, but with higher unit costs (Table 1).

<table>
<thead>
<tr>
<th>Competitive strategy</th>
<th>Required skills and resources</th>
<th>Organizational elements</th>
<th>Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost leadership</td>
<td>Significant capital expenditures and access to capital; Engineering skills Control over employees; Products that can be produced on a large scale; Efficient distribution network.</td>
<td>Cost management system; Frequent, detailed reporting; Structuring responsibilities and distribution of powers, clear regulation; Innovation based on the achievement of rigorous quantitative goals.</td>
<td>Technological changes that can set to zero the investments made; Low cost imitation strategy by competitors; Inability to notice market changes due to the great attention paid to cost management; Cost inflation that blurs the organization’s cost advantage.</td>
</tr>
<tr>
<td>Quality leadership</td>
<td>Strong marketing; Products production; Creative skills; Skills in basic research; Reputation of the organization as a technology leader; Long presence in the industry or unique skills achieved in other industries.</td>
<td>Coordination between functional units - R &amp; D, production, marketing More qualitative than quantitative assessment of investments; A creative atmosphere that can attract scientists, researchers, etc.</td>
<td>Price difference is valued by customers more than differentiation; Reducing customer differentiation needs; Competition imitation strategy nullified product differentiation.</td>
</tr>
</tbody>
</table>

Source: Designed by the authors

The leadership strategy by quality implies more intensive growth, receiving a price premium in comparison with competitors at the expense of special competencies in order to meet the needs of consumers.

The leadership strategy by costs implies achieving low unit costs compared to competitors, which means having special cost management skills (Mahdjour, and Fischer, 2014; (Makedon, V.; Drobyazko, S.; etc., 2019). As it was noted earlier, a cost leadership strategy and a quality leadership strategy can be a strategy for corporate innovation. To do this, let’s build a table of the main characteristics of leadership strategies in terms of costs and quality, but with indicators aimed at innovative development.

The leadership strategy by quality, which is focused on innovative development, is aimed at primacy in the development of new products, which is an indispensable condition for obtaining a price premium in competitive markets; therefore, the indicator of innovation activity and the innovation cycle time become the main indicators of the effectiveness of innovative management. Such a strategy is focused on high innovative activity of the corporation and speed in the implementation of new ideas through significant investments in R&D (Rivza, and Kruzmetra, 2017).

The leadership strategy by costs, which is focused on innovative development, is aimed at the effective use of invested funds, so the main indicator of the assessment is the deviation of the actual indicators of innovative budgets from the planned. Within the framework of such a strategy, a corporation is likely to follow the path of a “follower” behind organizations that have long been on the market, and its innovative activity will be aimed at reducing costs and increasing business efficiency.

The main goal of innovation planning and development security is to assess the achievement of certain specific performance indicators. At the same time, the annual plans of this activity lay down certain indicators by months. It is advisable to determine the main objectives of the innovative program of enterprise development.
They are as follows:

determination of trends in the development of scientific and technological progress in specific directions of the enterprise activity;
organization of enterprise development management;
determination of directions of innovation that are promising;
assessment of the effectiveness of innovative processes;
determination of risks arising in the process of creating and using innovations and their assessment;
development of projects for the introduction of innovations;
formation of innovation management system;
creation of a favorable innovation climate, as well as conditions for the organization’s adaptation to innovations;
making decisions aimed at stimulating innovative activity of the organization;
justification of innovative decisions in conditions of uncertainty and risk.

It is necessary to determine the conditions under which it is advisable to form an innovative program. If the costs of implementing individual innovation projects are greater than the costs of implementing the same projects, but combined into a program. For example, the costs of eliminating staff resistance will be lower for a program than for all projects separately.

If the implementation of an innovative program can provide a higher and sustainable economic effect than the implementation of individual projects. That is, if such a distribution of projects in time is possible, which ensures a continuous flow of funds. In this case, the decline in the profitability of individual projects is compensated by the growth in the profitability of other innovative projects.

To ensure the expected results of the implementation of innovative programs, careful management is required. The subjects of management of the innovative program of enterprise development are (Ebrahim, et. al. 2010; Virta, et. al. 2017):

enterprise owners (determine development strategy);
top-level managers (execute plans for implementing strategies);
management personnel of the enterprise (performs technical work, which consists in preparing project documentation, conducting feasibility studies of projects, making forecasts of changes in supply and demand in the markets of raw materials and finished products, creating cost estimates and implementing innovative programs, etc.);
staff or freelancers engaged in R & D (accumulate innovative ideas, study ideas for feasibility and the possibility of their implementation, create prototypes of innovative products and technologies, participate in the preparation of innovations in production, study the possibilities of their improvement and modernization);
performers of individual works on innovative programs (ensure receipt of the expected results of R & D in a timely manner, as well as prevent leakage of confidential information about the scientific achievements of the enterprise to competitors);
investors, lenders, insurers, etc. (they can be involved in innovative programs both at the stage of the formation of innovative ideas and at the stage of their implementation with a view to risk sharing).

At the present stage of economic development, many enterprises give preference not to process, but to product innovations. First, product innovations pay off more quickly than process innovations, and this is important in the context of limited funds. Secondly, with the help of product innovations, the product range is expanded, which is one of the most effective methods for increasing competitiveness in the domestic market. In general, the process of selecting innovative projects for the formation of an innovative enterprise program is quite complex and requires a certain sequence of implementation.
5. Discussion

We offer the following algorithm for the formation of an infrastructure development program and the introduction of product innovations.

Stage 1. Pre-selection of innovative projects among those available in the enterprise. At this stage it is necessary to analyze the quality indicators of the projects. To do this, you can analyze, for example, the level of products novelty. In addition, it is also necessary to assess the estimated demand for new products. This stage is necessary in order to reduce the cost of further analysis of innovative projects, since the evaluation of performance indicators is a time consuming and lengthy process, and also requires a large amount of information related not so much to the project, but to the company’s activities. In addition, the need for pre-selection for the degree of novelty is due to the fact that the heads of departments are tempted to include in the innovative program of the company and to receive funding for outdated and ineffective projects.

Stage 2. Analysis of the main characteristics of each innovation project. At this stage, each project from the set of alternatives should be analyzed. At the same time, the resources required for the implementation of an innovative project, the project’s profitability and the level of risk are estimated.

Stage 2.1. Assessment of the need for resources for the implementation of an innovative project. It is necessary to analyze the resources available in the company, as well as the resources necessary for the implementation of the project, and then compare them. Otherwise, the lack of resources at any stage of the implementation of an innovative project may cause the project to be terminated or completely stopped. Therefore, it is the resources that act as one of the limitations in the selection of innovative projects in the company’s program. In the proposed algorithm, innovative projects for which the company does not have enough resources are excluded from the selection.

Stage 2.2. Predictive assessment of profitability and risk of an innovative project. Profitability and risk are assessed according to established indicators. Projects with unsatisfactory values of the selected indicators are excluded.

Stage 3. Matching and comparison of the obtained characteristics of the projects under consideration and the formation of the program. you should choose of the projects that have passed on the indicators of novelty, profitability, risk, those from which the innovative program of the company will be formed. There may not be enough funds for the simultaneous implementation of all selected projects in the company, so the program should include those projects that will allow you to get the optimal combination of return-risk indicators. The relation of these indicators should be carried out by top management.

At the stage of forming an innovative program, it is proposed to use the following methodology: the calculation of indicators of profitability and risk for programs with various combinations of innovative projects with the subsequent comparison of these indicators by the choice of a program with the optimum ratio of the rate of return to risk. The proposed algorithm for comparing potential projects allows you to create an effective innovative program of the company. If the company has the necessary resources, the basic innovative program can be supplemented with new innovative projects that can improve the average effectiveness of the program.

Conclusions

Thus, taking into account the above, it is possible to determine the presence of the necessary attributes of an effectively functioning sectoral corporate cluster:

- high level of concentration of innovation carriers (small innovative companies, research institutes) and industrial potential, in accordance with industry characteristics;
availability of modern industry experimental infrastructure for the development of innovations in small-scale production;

sources of training qualified specialists for the industry segment of the cluster;

possibility of creating innovation and technology centers, as the basis for attracting innovations and investments;

system of sectoral cluster organization should form a target cooperation of all its subjects so that the aggregate of market relations in the cluster forms a continuous chain between the carriers of innovations, the experimental infrastructure and industrial production.

The implementation of the project of introducing innovative measures may cause resistance to change. In order to avoid resistance or downsizing, you can make changes to include such aspects:

changes need to be introduced in certain portions, which take into account the specificity and adaptability of the enterprise (this will allow employees to adapt to the situation, bring all the innovations into a habit and then move on);

the most unpopular changes need to be introduced first (a one-time introduction of unpopular innovation, accompanied by guarantees for the level of salaries and the preservation of the new hierarchy, will allow better control of the situation).

To achieve the effectiveness of the implementation of a technical re-equipment project, it is necessary to fulfill the condition of an appropriate level of control and corrective measures. At each stage of the development and implementation of the project it is necessary to clarify the correctness of its implementation. On the basis of control, it is possible to identify the main problems and deviations from the planned actions, as well as the failure of the new equipment. In addition, all processes must be accompanied by regulatory measures. Under these conditions, it is possible to achieve the maximum effect from the introduction of innovative changes in the production structure of the enterprise.

References


Davis, C. H., Creutzberg, T., & Arthurs, D. (2009). Applying an innovation cluster framework to a creative industry: The case of screen-


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SECURITY OF ORGANIZATIONAL CHANGES VIA OPERATIONAL INTEGRATION:
ENSURING METHODOLOGY

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Abstract. The concept and the need of organizational changes in the corporate environment in order to ensure a lasting effect of economic and strategic security were determined. The methodology for conducting organizational changes based on the use of optimal operational integration, which forms a decomposition of the company’s development goals and forms the field of economic security was proposed. The model analysis of ensuring effective organizational security and operational integration of the functional units of the company was carried out.

Keywords: company security, operational integration, organizational changes, company value, business development strategy, functional units, management process


JEL Classifications: C51, L20, M20

1. Introduction

Under the conditions of globalization of the economy, which are constantly changing, such as unevenness of the functioning of a market economy, fluctuations in production and sales, emergence of deep production recessions, the possibility of a crisis increases, which should be considered as some general pattern and a threat to economic security. In the market economy conditions, crisis situations inevitably arise both for the system as a whole and for individual economic entities. However, the adaptation of most of them to market conditions is slow process. One of the real ways for a company to overcome the crisis and increase business efficiency is organizational change - the transformation of all key areas of operation. Organizational changes are deliberate changes in an enterprise caused by external events, implemented through various projects (business projects, innovations). Examples of major changes can be mastering of improved technology, creation of a new product, improvement of the organizational structure and integration corporate processes.
2. Literature Survey

In the scientific community, the works of such scientists as (Bhojraj & Sengupta 2003; Cawsey & Deszca 2007; Isern & Pung 2007; Kotter 2012; Sams, 2001; Wit & Meyer 2005; Zahavi & Lavie 2013) are well known, which describe in detail and model various aspects of organizational changes. But only extensive methodological studies of ensuring the long-term security of organizational changes based on optimal operational integration have considerable scientific value (Drobyazko S., 2017).

The aim of the scientific article is to develop a methodology for implementing the security of organizational changes based on optimal operational integration and its practical testing based on company cases.

The category “Organizational change” is understood very broadly, both by business and the scientific community. The range of ideas about the scale, the expected economic effect and features of the implementation of organizational change varies from “periodic changes of some functions within the existing organizational structure” to “cardinal active transformation of the system of goals, objectives, functions, organizational structure and corporate culture of the company” (Boohene, Williams, 2012). In this case, it obviously makes sense to consider two types of changes that differ in directions: planned (targeted) and unplanned (spontaneous, including “quick” changes, carried out without a predetermined system-wide goal).

3. Methods

The planned organizational changes should be understood as the process of the purposeful controlled transfer of the organizational system from the current state to some given (desirable), and the change planning is the formation of goals and ideas about the necessary parameters of changes (Monni, S.; Palumbo, F.; Tvaronavičienė, M., 2017; Kubeš, V; Rančák, J., 2018; Girdzijauskaite, E., Radzeviciene, A., Jakubavicius, A. 2019).

In order to ensure effective control of such a project, one should determine formal change management procedures. Goals, plans, project management, use of resources, contracts, standards used could be changed (Mullins 2005). In addition, the changes should go through five main stages: description, assessment, approval, implementation, confirmation of changes (Fig. 1).

According to one of the modern management concepts based on assessing and maximizing the value of a company and the safety of its development, organizational changes can be considered successful only if they lead to an increase in the value of the company or an increase in profitability, while both cost and profitability are understood as competitive advantages and considered as the most important control objects. Valuation of the company and its level of profitability allows us to develop a corresponding project of organizational changes based on estimated value growth or search for reserves to increase profitability of work, which positively affects the overall profitability, and can also be used as a tool for managing the process of organizational change (Cunliffe, A.L., 2008; Vinogradova, N.P., Popov, A.N., 2019; Osmyatchenko, V., Oliinyk, V., Mazina, O., Matselyukh, N., Ilin, V., Orzel, A., 2019).
At present, a combination of business development strategy determination and organizational change strategies is observed in the work of companies, since each of them is based on monitoring and analyzing the initial situation “as it is”, forecasting and modeling possible scenarios for the company’s development; sets the main goals of the changes, taking into account the potential laid down in the existing business, and determines the ways to achieve them (“as it should be”).

4. Results

Taking into account the above, a typology of basic strategies, directions and types of changes is proposed in accordance with business development strategies:

1. Business expansion (growth) strategy. It is aimed at improving the efficiency of operations and is associated with the development of the existing company, ensuring high growth rates, including increasing competitiveness, winning new or expanding existing markets, optimizing the organizational structure, and diversifying activities (Smith & Coy 2018).

2. Business reduction (recovery) strategy. It is aimed at financial recovery, corporate recovery, company’s costs reduction in recessive conditions and its preservation.

The main directions of organizational changes in the company include: improving financial and economic activities and improving the organizational structure and management system (Tushman, Anderson 1997).

Depending on the type of structural transformations that are carried out at the enterprise, organizational changes are classified as restructuring of equity, assets, liabilities, production and management systems. The choice of strategies, directions, types of structural transformations, as well as the determination of the main tasks of management depend on the specific situation at the enterprise and the conditions for their implementation (Drobyazko S., etc., 2019).
Improving the investment attractiveness of the company as a result of changes is the basis for planning the entire investment process: from determining future investment volumes to managing financial and business activities in order to achieve the desired capital inflow. However, for the development of domestic machine-building enterprises, it is necessary to guarantee the satisfaction of the interests not only of lenders and investors, but also of business owners, since they are among the first to experience a crisis situation in the enterprise and bear real losses of resources invested in their own capital (Goetz et. al. 2013; Makedon, Korneyev 2014b).

For an international company, the investment value is the value of the company’s property complex, which is determined on the basis of its profitability from the perspective of a particular investor or group of investors, based on the company’s market prospects for given investment goals. The investment value of a company can be used as a generalized indicator of the effectiveness of the management process of organizational change in a company (Servaes 1996). All other types of value in the process of organizational change can be used as an additional tool in making management decisions and applied in forecasting specific economic situations (Table 1).

<table>
<thead>
<tr>
<th>Change strategies</th>
<th>Directions of change</th>
<th>Types of organizational transformations</th>
<th>Types of value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Improvement of organizational structure</td>
<td>Restructuring of production</td>
<td>Book value. Investment value</td>
</tr>
<tr>
<td></td>
<td>Improvement of management system</td>
<td>Restructuring of management system</td>
<td>Internal (fundamental) value.</td>
</tr>
<tr>
<td>Business reduction (recovery)</td>
<td>Improvement of organizational structure</td>
<td>Restructuring of obligations</td>
<td>Market value. Investment value.</td>
</tr>
<tr>
<td></td>
<td>Improvement of management system</td>
<td>Restructuring of assets</td>
<td>Mortgage value. Internal (fundamental) value.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Restructuring of production</td>
<td>Book value. Liquidation value.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Restructuring of management system</td>
<td>Value for tax purposes.</td>
</tr>
</tbody>
</table>

Source: Designed by the authors

In the practice of valuing a company, various approaches are used - costly, comparative, profit; within each of which several methods of valuation are applied, taking into account certain peculiarities of the company. A comparative analysis of the standards and methodological guidelines for business valuation suggests that the profit approach best meets the goals and objectives of organizational change, since it takes into account the interests of the investor, the level of business risk (through the discount rate) and future changes in income and expenses. In addition, it is this approach that makes it possible to correctly take into account all the changes that are planned in the process of organizational changes and the risks of economic security.

The justified strategy of organizational changes in order to comply with economic security allows choosing controllable factors that have the potential to increase the investment value (Table 2), that is, to determine the company’s internal and external reserves, the “engines” of value at the current time point, since the influence of various factors on investment value of the company is uneven.
### Table 2. Factors influencing the investment value, the level of profitability and security of the company’s market functioning by type of organizational change

<table>
<thead>
<tr>
<th>Forms of organizational change</th>
<th>Factors for changing investment value</th>
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<tr>
<td><strong>Organizational change strategies</strong></td>
<td></td>
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<tr>
<td><strong>Directions of organizational change</strong></td>
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<td><strong>Types of organizational changes</strong></td>
<td></td>
</tr>
<tr>
<td>Restructuring of obligations</td>
<td>Change in company’s debt. Need for net working capital. Structure of invested capital.</td>
</tr>
</tbody>
</table>

*Source: Akhter 2017; Cummings & Worley 2001; Gareis 2010*

In addition, for specific directions of organizational changes and types of structural transformations, it is necessary to determine how cost and profitability change depending on changes in certain factors.

One of the most responsible stages in the process of implementing organizational changes, in the authors’ opinion, is setting of tasks for departments, in other words, decomposition of the company’s development goals (C) into a system of tasks, norms and requirements that are formed for each company department (U).

In the ideal case, this stage proceeds in accordance with the selected change parameters. In the corporate management system there is operational information about the current state of the company and the current results of transformations of its structure and functions. In reality, these processes take place in the conditions of (Kim et. al. 2017):

a) insufficiently reliable information, if there are errors in assessing the results of changes;
b) constraints imposed on resources (primarily human) allocated to the implementation of transformations.

In general, the principle of distribution of tasks and resources between departments assumes that each department of a company must include in the plan of its organizational transformations each of the tasks facing the entire company. By resources we understand the whole complex of means capable of ensuring the process of organizational transformations in accordance with the goals of the company: material, financial, human (labor), informational (intellectual, including production technologies, services and management), administrative (including the possibilities of delegation and redistribution of powers and responsibility) (Makedon et. al. 2019a).

This approach we will call “the principle of distributed responsibility”.

Mathematically, we demonstrate this principle using a matrix $D$: 

\[
D = \begin{bmatrix}
D_{11} & D_{12} & \cdots & D_{1n} \\
D_{21} & D_{22} & \cdots & D_{2n} \\
\vdots & \vdots & \ddots & \vdots \\
D_{n1} & D_{n2} & \cdots & D_{nn}
\end{bmatrix}
\]
where \( d_{ij} \) – necessary intensity of solving the \( i \)-th task by the \( j \)-th department of the company, depending on the goals, as well as resource and methodological security; 

\( n \) – total number of goals (tasks) facing the company at this stage; 

\( m \) – total number of departments of the company (main, functional and auxiliary).

For example, \( d_{11} \) – intensity of solving by the first department of the first task \( c_1 \) facing the company; 
\( d_{12} \) – intensity of the solving by the first department of the second task \( c_2 \), facing the company; 
\( d_{21} \) – intensity of the solving by the second department of the first task \( c_1 \) and so on.

The result of the operational planning of organizational changes, carried out in accordance with the principle of distributed responsibility, will be a system of measures \( U=(U_i)_{m \times 1} \) consisting of \( m \) tasks \( (u_1, u_2, \ldots, u_m) \) by the number of operating departments of the company:

Thus, according to the methodology, the task of the first department is presented in the form of \( u_1 = d_{11}c_1 + d_{12}c_2 + \ldots + d_{1n}c_n \) and indicates that the organizational changes plan for this department should include all \( n \) tasks \( (c_1, c_2, \ldots, c_m) \), facing the company. It is clear that the intensity \( (d_{11}, d_{12}, \ldots, d_{1n}) \) of solving each of the tasks by this department will be different and will be determined by the adopted parameters of organizational changes \( (P) \).

Let’s suppose that the company faces the following interrelated development tasks that ensure its adaptation to changing conditions, and the transition to a new strategic position: 
\( c_1 \) – product diversification; 
\( c_2 \) – application of the latest achievements of scientific and technical progress in the production; 
\( c_3 \) – formation of own sales network; 
\( c_4 \) – creation of a corporate culture conducive to the effective implementation of innovations in production and management.

Let’s designate plans for organizational changes of departments (functional areas) of the company: 
\( u_1 \) – production; 
\( u_2 \) – HR–department; 
\( u_3 \) – sales department; 
\( u_4 \) – R&D; 
\( u_5 \) – financial department; 
\( u_6 \) – department of marketing and advertising.

Let’s consider the plan for organizational changes in the production function of the company \( u_1 = d_{11}c_1 + d_{12}c_2 + d_{13}c_3 + d_{14}c_4 \).

The elements on the right side of the expression are the four parts of the plan \( u_1 \) of organizational changes carried out by the production department of the company. As can be seen, in accordance with the principle of distributed responsibility, the following intensities should be characteristic for the process of organizational changes in the
production function of the company: \( d_{11} \) – product diversification; \( d_{12} \) – application of the latest achievements of scientific and technical progress in the production; \( d_{13} \) – formation of own sales network; \( d_{14} \) – creation of a corporate culture conducive to the effective implementation of innovations in production and management.

The first \( d_{11} c_1 \) and the second \( d_{12} c_2 \) parts of the \( u \) plan can be called the “obvious tasks” of this department, while the third \( d_{13} c_3 \) and the fourth \( d_{14} c_4 \) parts indicating uncharacteristic functions for the production department are “implicit tasks”.

Those parts of the transformation plans of a particular department that demonstrate the non-specific functions of this department could, alternatively, be called “non-core” or “secondary”. However, the term “implicit” reflects one important feature of adaptive processes occurring in companies - the lack of the necessary coordination of actions of departments in solving new and, above all, innovative tasks for departments (Sukumaran et. al. 2015). The concentration of corporate management units on their own (obvious) tasks and their own economic security often leads to serious mismatch in joint activities. At the same time, the implementation of organizational changes in most cases requires the formulation of precisely “uncharacteristic” tasks, as well as the search for new methods for their solution and coordination of activities. For other departments (functional areas) of the company, the corresponding elements of the matrix \( D \) have the same meaning, but the intensity of these processes (resource expenditure) will be different.

Thus, each department has its own plan for organizational change, and each component of such a plan is a combination of particular tasks that help to divide the overall process of change in the field of activity into its constituent elements. The concept of distributed responsibility as the most general principle of the decomposition of the tasks of organizational change is perhaps compliant with the conclusion of (Porter 2008) on the “common citizenship” of company departments.

A formal interpretation of the task distribution process when making changes should take into account the dynamism (namely, the cyclical nature) of the task distribution processes during the implementation of organizational changes. Information about the results of complex organizational changes that affect the economic characteristics and economic security of the company allows the management to quickly change the process of organizational changes. In other words, it is important to get information in time about how complex organizational changes influence the economic characteristics of a company (Sullivan, 2016). This will enable management to make timely changes to this process.

Then, taking into account feedback based on the results of transformations \( (R) \) in the tasks formed for each department, it’s not the strategic goals of the company’s development that will be linked, but the operational information about the mismatch \( (\Delta) \).

The mismatch \( \Delta_{c_i, p_i, R, Y_R} = (\pi, c, R, \Upsilon_R) \) should be understood as operational information that demonstrates how the results of the organizational changes made differ from the desired state, where \( p_i \) – functional dependence, which forms the requirements for the expected results of organizational changes in the context of their compliance with the objectives of the company; \( c_i \) – purpose of the company’s development; argument \( Y_R \) – indicates the possibility of errors in the assessment and interpretation of transformation results.

For example, if \( c_i \) – purpose, which is to create a corporate culture that will contribute to the effective implementation of innovations in production and management, then \( p_i \) – will set the following system of requirements: increase the level of professional competence of staff; dominance in the team of an expert leadership model; reduced bureaucracy management; formation of professional attitude to management in the departments responsible for innovation and technology.

Then the mismatch \( \Delta \) will present a set of information that shows in control periods how completely and qualitatively these requirements are implemented. Taking into account the comments under consideration, the system of dynamically formed problems \( U(t) \) can formally be represented as:
where the time argument \( t \) indicates that the process of the formation of tasks by departments during organizational transformations is dynamic in nature, which changes.

The dynamic nature of the formation of tasks by departments shows how precisely this stage of change management is composed and responsible. However, it is just such a closed control loop that makes it possible to make adjustments to the change management process on time (Aguiar, & Reddy 2017). The effectiveness of change management, as a result, determines the level of efficiency of management of the company’s development, taking into account its impact on the external market environment.

It is obvious that the greater the number of directions of the company’s activities to be transformed, the more active the organizational system’s response to changes in the external environment will be (Bhatia & Thakur 2017). However, apart from the number of attracted elements, the strength of their interaction is of great importance. In other words, the content and efficiency of transformations in a company, among other things, are determined by the type and characteristics of its structure.

What is the purpose and how should the company’s departments solve the “implicit” tasks set for them? The solving “implicit” tasks by the departments allows the company to consolidate the efforts of all functional and auxiliary departments in solving common tasks. Such consolidation is possible through the rational integration of departments.

Under the current (operational) integration of units, we understand the reasonable choice of one of the possible coordination mechanisms for their interaction in the interests of effective implementation of planned organizational changes. Mathematically, the system of integration, which is the joint coordination of the efforts of the units to solve common problems, can be represented by \( I \):

As you can see, the integration matrix is square \( m \times m \), where \( m \) is the number of functional departments of the company.

Let’s form a meaningful content of the elements of the proposed matrix: 
\( i_{ii} \) – internal integration (coordination) efforts of the first department, aimed at ensuring the high efficiency of its own (“obvious”) part of organizational transformations; 
\( i_{ij} \) – integration (coordination of activities) of the first and second departments, carried out in the interests of organizational transformations of the first department; 
\( i_{ji} \) – integration (coordination of activities) of the first and second departments, carried out in the interests of organizational transformations of the second department.
Within the framework of the above case model: \(i_{11}\) – internal integration (coordination) efforts of the production department, aimed at ensuring high efficiency of the process of updating production equipment or technologies; \(i_{12}\) – integration of the production department and HR-department (in the interests of production), aimed at coordination and joint formulation of requirements for production personnel (workers, technologists, engineers).

The coordinated work of these two departments, for example, may allow the production department to avoid the need to recruit insufficiently qualified specialists.; \(i_{2}\) is also coordination of activities of the production department and HR department (in the interests of the HR department), aimed at coordination and joint formulation of requirements for production personnel. The integration of these two departments allows the HR department to avoid wasting time and other resources on finding and hiring personnel, production department that does not fully meet the requirements (Isom & Tiemann 2014).

In other words, the integration matrix is a system of horizontal coordination of the process of solving common tasks of a company. Meaningfully, the integration matrix is a table that quantitatively describes the density of interaction between departments when solving problems of organizational change (Table 3). The strength of the department interaction can be assessed by arbitrary units in the range from “0” (complete lack of interaction) to “1” (the maximum possible interaction).

<table>
<thead>
<tr>
<th>(m)</th>
<th>Functional directions</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Production</td>
<td>Finance</td>
<td>Marketing</td>
<td>Personnel</td>
</tr>
<tr>
<td>Production</td>
<td>1</td>
<td>0.5</td>
<td>0.2</td>
<td>0</td>
</tr>
<tr>
<td>Finance</td>
<td>0.5</td>
<td>1</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>Marketing</td>
<td>0.2</td>
<td>0.7</td>
<td>1</td>
<td>0.2</td>
</tr>
<tr>
<td>Personnel</td>
<td>0</td>
<td>0.1</td>
<td>0.2</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: Designed by the authors

This case demonstrates an option of the operational state of the company’s organizational structure, in which its production departments do not practically interact with the HR department \((i_{14} = i_{41} = 0); the strength of the interaction of the financial and production departments can be called the average \((i_{12} = i_{21} = 0.5), and the financial and marketing functional areas interact “more closely” \((i_{23} = i_{32} = 0.7). The strength of the internal integration of each department is assessed as “1” (diagonal cells of the matrix).

The principle of distributed responsibility in combination with the principle of integration of departments and compliance with the requirements of economic security, according to the authors, represents the most general model of the distribution of tasks during organizational changes. However, this approach can hardly be called widespread in business practice. Most modern companies have a functional or linear-functional structure with the number of hierarchy levels from two to six (Chakrabarti & Mitchell 2004). One of the main drawbacks of such structures is the misunderstanding by the management of the functional departments of the overall objectives of the company. The phrase “misunderstanding” indicates here not so much the lack of information for middle management about the general direction of the company’s development, but rather about the presence of conditions that encourage management to focus only on the “obvious” tasks of its departments without taking into account the necessary level of integration with other departments.

A large number of hierarchy levels with a high centralization of management leads to a decrease in the integration activity of the managers of functional and auxiliary departments, since they do not have the authority to make independent decisions. Decentralization and the presence of informal horizontal links make it possible to partially eliminate this disadvantage. Thus, close interaction is characteristic for matrix and multidimensional structures. However, the unjustified intensification of information exchange between parts of an organization or the unreasonable concentration of powers in one part of a company often not only does not eliminate contradic-
tions, but also strengthens them. In some cases, it is the simplification of internal functional relationships that leads to an increase in the level of economic security and managerial stability.

It is obvious that such an understanding of the role of integration between parts (business functions) of a company allows us to formulate an assumption about some optimal interaction in the implementation of organizational changes. Since operational integration has a dynamic nature, this circumstance makes it possible to consider management of organizational changes as a process of forming operational (temporary) organizational structures, the composition and nature of relations within which is optimal precisely for this (current) stage of management of organizational changes. In such a statement, the criterion for the optimality of such temporary structures is the minimum value of the mismatch ($\Delta$).

According to such a matrix model, elementary organizational changes $dR$ is an additive-multiplicative connection of such factors as the tasks facing the departments and the degree of their coordination (integration):

$$dR = \begin{pmatrix} dR_1 \\ dR_2 \\ \vdots \\ dR_j \\ \vdots \\ dR_m \end{pmatrix} = I \times U = \begin{pmatrix} i_{11} & i_{12} & \cdots & i_{1j} & \cdots & i_{1m} \\
 i_{21} & i_{22} & \cdots & i_{2j} & \cdots & i_{2m} \\
 \vdots & \vdots & \ddots & \vdots & \ddots & \vdots \\
 i_{j1} & i_{j2} & \cdots & i_{jj} & \cdots & i_{jm} \\
 \vdots & \vdots & \ddots & \vdots & \ddots & \vdots \\
 i_{m1} & i_{m2} & \cdots & i_{mj} & \cdots & i_{mm} \end{pmatrix} \times \begin{pmatrix} u_1 \\ u_2 \\ \vdots \\ u_j \\ \vdots \\ u_m \end{pmatrix},$$

where based on matrix transformation ($dR_j = i_{1j}u_1 + i_{2j}u_2 + \cdots + i_{jj}u_j + \cdots + i_{mj}u_m$). That is, in the most general case, any elementary organizational change $dR_j$ is implemented in the $j$-th department and is the result of the work of all departments of the organization thanks to the coordination of their activities in the interests of the $j$-th department.

It is obvious that the type and depth of integration of each department with each of the other departments of the company should depend on the nature, complexity and urgency of the jointly solved tasks. The effectiveness of each elementary organizational change implemented in the company’s departments depends on the effectiveness of the solution of this task by all departments of the company in the most favorable integration of all departments in order to solve this problem.

What types of coordination mechanisms and ways to integrate departments should be considered the most effective for making organizational changes? What is meant by optimal integration? It seems that in order to receive answers to these questions, it is necessary, first, to analyze all possible coordination mechanisms and conditions, and second, to determine the optimal integration criteria for various models of organizational change.
Table 4. Forms of organizational interaction, involving various measures of coordination

<table>
<thead>
<tr>
<th>Strength of integration (conditional coefficient)</th>
<th>Forms of organizational interaction</th>
<th>across group-wide organizational forms</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Maximum integration (0.8-1.0)</td>
<td>Work teams</td>
<td>Adhocracy (matrix and project structures, a significant flow of informal communications). Mutual coordination Combines, vertically integrated structures</td>
</tr>
<tr>
<td>2. High integration level (0.6-0.8)</td>
<td>Permanent Integrators Linking Positions</td>
<td>Simple structure (centralization, a significant flow of informal communications). Direct control</td>
</tr>
<tr>
<td>3. Average integration level (0.4-0.6)</td>
<td>Temporary working teams, standing committees</td>
<td>Professional bureaucracy (a significant flow of informal communications at the core level). Standardization of qualification</td>
</tr>
<tr>
<td>4. Low integration level (0.2-0.4)</td>
<td>Temporary direct contacts</td>
<td>A. Mechanistic bureaucracy (functional structure, weak informal communications). Standardization of labor. B. Divisional structures. Standardization of output.</td>
</tr>
<tr>
<td>5. Extremely low integration level (0.0-0.2)</td>
<td>Information systems remote employees (freelancers)</td>
<td>Outsourcing</td>
</tr>
</tbody>
</table>

Source: Designed by the authors

The scientist (Mintzberg 2007) identifies five coordination mechanisms through which companies coordinate their activities: mutual coordination, direct control, standardization of work processes, standardization of output, standardization of skills and knowledge (qualifications). In some cases, to achieve the necessary nature of coordination of departments, five coordination mechanisms are not enough. As a rule, companies develop integrated tools that provide the necessary level of interaction between individual employees and departments. It is possible on the basis of generalization of these classifications to allocate five degrees of integration for various forms (scales) of organizational interaction (Table 4).

Operational integration activity and integration capabilities of departments. Conducting organizational changes in a company requires various integration activities of its parts. The integration activity of a department should be understood as its desire to combine resources with resources (primarily intellectual and informational) of other departments. At the same time, the desire to attract the resources of other departments to solve “their own” (formerly “implicit” tasks) is called the “internal integration activity” of the department, and the desire to participate in solving the tasks of other departments - “external integration activity” (Thakor 2003).

The set of integration activities of departments generates the property of organizational convergence. The required degree (type) of the integration activity of department should be determined on the basis of a formalized view of the criteria for the effectiveness of organizational transformations.

For example, the desired degree of integration activity during a reactive (that “overtakes”) organization’s adaptation to changes in the external environment can be determined based on the condition of ensuring the smallest current deviations of the organization’s state from the requirements dictated by changes in its environment (“mismatches” (Δ)).

As shown in [8], the management of reactive adaptation by the criterion of minimum expectation and mismatch requires consideration of the rate of change of the external environment and the level of information uncertainty:

\[ K_{opt} = \sqrt{\frac{2m_v}{Q}} \]

where \( K_{opt} \) – optimal (by the criterion of the minimum probability characteristics of the mismatch) level of
adaptation intensity, provides for the integration activity of the departments;

\[ m_v \] – average (over the observation period) rate of change of the external environment (in the field of department responsibility);

\[ Q \] – level of information uncertainty of the state of the external environment (dispersion of assessments).

As can be seen, an increase in the level of information uncertainty of processes, the management of which falls within the scope of responsibility of the company, leads to the need to reduce the strength of its coordination (integration) activity. In addition, different departments have different adaptation potentials due to the specifics of their factors.

These conditions force the units to respond to changes in the external environment at different speeds, which, in turn, causes disintegration in the work of the entire organization. According to a well-known specialist in the field of organizational change management (Adizes 1991) “Any change causes disintegration”.

In this world, everything consists of systems. Systems, in turn, consist of subsystems that cannot respond to changes at the same rate. There are “gaps” between the subsystems (George & Jones 2007).

In the framework of “catching up” adaptation, an increase in integration and, as a result, the elimination of coordination “gaps” between departments is possible only by reducing each department’s “own” level of information uncertainty. At the same time, the “artificial” integration due to the “forced” coordination of the activities of the departments will only lead to the organization deviating from the given trajectory of organizational changes, causing an increase in the variance of the mismatch, making the process of producing results random. Figuratively speaking, “forced” coordination of department, which structural and functional parameters are characterized by a high level of information uncertainty, with other departments will lead to the formation of unreliable information in the organization of circulation channels (Gilbert 2017).

As can be seen, the implementation of reactive organizational changes leads to a very destructive contradiction: the desire of the management of individual departments to integrate to reduce the level of information uncertainty turns into an increase in the overall organizational level of information uncertainty.

5. Discussion

Strictly speaking, an increase in the level of information uncertainty should lead to a decrease not in the integration needs of the department, but in its integration capabilities, in other words, in its integration powers. The integration capabilities of a department should be understood as the degree and nature of its interaction with other departments of the organization, justified on the basis of a formalized idea of the effectiveness of organizational changes and the directives established for this department.

One of the primary tasks of the preparation and implementation of organizational changes is the justification and optimization of the integration powers of all departments of the company, which is a process of dynamic optimization of the organizational structure of the company (Ye et. Al. 2017). At the same time, the criterion for dynamic optimization of an organizational structure is understood as the most complete correspondence of the organizational structure to the goals and objectives of the changes. Thus, in the course of organizational changes, the task of operational optimization of the integration powers of departments is the process of forming “operational-optimal” organizational structures that most contribute to the implementation of changes in other (non-structural) aspects.

Various integration powers and the corresponding integration activities of the departments generate temporary change control centers, and the company’s organizational structure is temporarily likened to a network structure.

An illustrative example (Table 5) demonstrates one of the possible options for the distribution of activities and the formation of temporary centers for change management.
Table 5. Operational distribution of integration powers (case example)

<table>
<thead>
<tr>
<th>Company’s department</th>
<th>Department 1</th>
<th>Department 2</th>
<th>Department 3</th>
<th>Department 4</th>
<th>Department 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department 1</td>
<td>1,00</td>
<td>0,75</td>
<td>0,90</td>
<td>0,85</td>
<td>0,70</td>
</tr>
<tr>
<td>Department 2</td>
<td>0,00</td>
<td>1,00</td>
<td>0,85</td>
<td>0,95</td>
<td>0,00</td>
</tr>
<tr>
<td>Department 3</td>
<td>0,30</td>
<td>0,40</td>
<td>1,00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Department 4</td>
<td>0,00</td>
<td>0,80</td>
<td>0,75</td>
<td>1,00</td>
<td>0,30</td>
</tr>
<tr>
<td>Department 5</td>
<td>0,10</td>
<td>0,00</td>
<td>0,60</td>
<td>0,00</td>
<td>1,00</td>
</tr>
</tbody>
</table>

Source: Designed by the authors

Such a distribution indicates, for example, that department 1 (see the first row of Table 5) becomes a temporary center for change management, attracting resources from all departments to solve problems in the form of creating joint work teams and attracting integrators. At the same time, department 3 (see the third column of Table 5), being “demanded” as much as possible, is forced to delegate its own resources in the interest of solving the tasks of other departments.

It is worth making this observation. Integration capabilities, which are determined analytically or distributed by the company’s management in a different way, are only requirements or recommendations themselves. However, in the process of implementing organizational changes, perhaps, we should expect the desire of the departments to increase the “internal” and decrease the “external” integration activities, which will lead to an increase in corporate convergence. As a result, such a “redistribution of integration powers” can lead to a deviation from the optimal trajectory of managing organizational changes, reducing the predictability of their results and adversely affect the economic security of the company. However, this methodology is positive and organizationally reasonable, which indicates the possibility of its practical application in the environment of production companies.

Conclusions

It was proved that the methodological approaches to changes in the work of companies should be based on the principles of consistency, complexity and functionality. The implementation of these principles should occur through the following possible types of organizational change, such as: 1. unplanned changes, which should be a reaction of the enterprise to any events and trends that may be threatening or, conversely, provide unexpected new opportunities; 2. planned changes - willingness to react at the right time for favorable opportunities or problems in accordance with the goal of the most complete use or maximum leveling of the impact; 3. imposed changes that occur under the influence and on the initiative of the management of the enterprise in order to adequately respond to urgent situations or events; 4. integration changes that are aimed at increasing the “internal” and reducing the “external” integration activities, which will lead to an increase in the level of functional interaction.

References


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Abstract. The article determines the factors of effectiveness of the formation of the organizational culture of the enterprise and its role in ensuring personnel security. It was proven that an enterprise can improve the quality of personnel security by developing an organizational culture in order to obtain positive dynamics of changes in economic efficiency indicators. An econometric model was proposed for determining the level of dependence of economic parameters of an enterprise on the directions of development and transformation of organizational culture. A tool for assessing the state of the organizational culture of the enterprise and assessing its impact on personnel security was proposed.

Keywords: personnel security, organizational culture, culture carrier, management decisions, external environment, assessment of efficiency, econometric model.


JEL Classifications: C10; M14

1. Introduction

Constant changes in the external environment, complications in the industrial and commercial activities of enterprises, increasing the value of the time factor, expanding the enterprise’s space and increasing the volume and speed of obtaining information and new knowledge create significant pressure on the overall organizational and economic security of the enterprise and increase the importance of internal sources of economic growth able to ensure production growth and protection of personnel, as the basis of economic potential. This very important resource capable of creating a flexible, adaptive and thus efficient production system becomes precisely the organizational culture, which, with qualitative parameters, is able to form the outlines of the personnel security of the enterprise.

2. Literature Survey

The study of the problems of the organizational culture of the enterprise and its personnel security, in recent years has been covered in the following scientific works of (Amah, 2006; Clarkson, et. al. 2011; Daft, 2003; Gibson, 1998; Jankalová, & Jankal, 2017; Lok, Crawford, 1999; Reisyan, 2016; Robbins, and Judge, 2011; Zak, 2018; Lorincová et al., 2019; Kumar et al., 2019; Havierniková, Kordoš, 2019).

At the same time, it should be noted that the problem of effective development of the organizational culture of the enterprise and the degree of its influence on the effectiveness of personnel security, production activity is
not sufficiently studied and requires constant updating and specification of methodological approaches (Drob-yazko S., 2018, 2019). This determines the scientific value of this study.

The purpose of this scientific work is the theoretical and practical need to determine the organizational characteristics of the formation and development of organizational culture within the industrial enterprise, which is aimed at increasing the productivity of personnel.

3. Methods

We can argue that the formation of an organizational culture of an enterprise, as a system of interconnected elements, is inextricably linked with the fact that the internal environment interacts with the external environment and in the process of interaction, internal actors are integrated and adapted to the external environment. The formation of organizational culture occurs through the solution of two major tasks: internal integration and external adaptation (Bersin, et. Al. 2018). Internal integration is associated with finding ways to work together and coexist within the enterprise (Tab. 1).

Table 1. Strategies for the formation of a new type of organizational culture

<table>
<thead>
<tr>
<th>Type of strategy</th>
<th>Content of strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cultural strategy</td>
<td>Formation of content of values, ethics, integrity and unity</td>
</tr>
<tr>
<td>2. Network strategy</td>
<td>Formation of living, developing network of associations</td>
</tr>
<tr>
<td>3. Leadership strategy</td>
<td>Leadership as a link in all organizational structures</td>
</tr>
<tr>
<td>4. Strategy of innovative thinking</td>
<td>Formation of teams that manage themselves with innovative thinking</td>
</tr>
<tr>
<td>5. Strategy of innovative processes</td>
<td>Introduction of simplified, open procedures that facilitate joint activities</td>
</tr>
<tr>
<td>6. Strategy oriented on the external environment</td>
<td>Creation of an organization, an external environment that is self-corrected and adapts to the culture</td>
</tr>
<tr>
<td>7. Strategy of change</td>
<td>Change in the way of change, strategic integration</td>
</tr>
</tbody>
</table>

Source: Stoner, et. al. 2001; Treven, et. al. 2008

The process of an organizational culture formation begins with the fact that internal subjects, as a system of social elements (Fig. 1), form a certain type of organizational culture as a result of interaction with the external environment.

Fig. 1. Main directions of management initiatives for the formation of organizational culture

Source: Cameron, & Quinn, 2011; Felin, & Powell, 2016
An external adaptation is associated with search and finding by the enterprise of its niche in the market and its adaptation to the external environment, which is constantly changing. It should also be noted that the solution of two major tasks, and thus the formation of an organizational culture, is directly related to the life cycle of the enterprise. (Klassen, & McLaughlin, 1996).

4. Results

Let’s determine the main features of the target orientation of the enterprise at different stages of its development (tab. 2). Here, for analysis, we will use the competing values framework proposed by (DeRosa, 2017) and adapt it to domestic conditions.

<table>
<thead>
<tr>
<th>Stage and purpose</th>
<th>Type of strategy. Brief description</th>
<th>Brief description of organizational culture features</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Formation.</strong> «Application» in the market of goods / services</td>
<td>Entrepreneurial. Attract attention to the product, find own consumer, organize sales and service, become attractive to the consumer</td>
<td>Democratic type of organizational culture. A cultural space is being formed within which: projects with a high degree of financial risk are accepted; employees feel themselves as innovators, they are initiative, willing to take risks, not afraid of responsibility; management methods, labor, production stipulate the required state of the environment, provide low staff turnover.</td>
</tr>
<tr>
<td><strong>Intensive growth.</strong> “System multiplication”</td>
<td>Dynamic growth. An increasing growth in production and quality, and thus in the number of structures</td>
<td>Clan type of organizational culture. A cultural space is being formed within which: there is a constant comparison of current goals and the creation of a foundation for the future; written fixation of policy of the enterprise and basic procedures; there is a close interaction of employees, a high degree of internal integration; structural subdivisions, a high degree of employee focus, and thus the flexibility of the enterprise in conditions and other changing.</td>
</tr>
<tr>
<td><strong>Stabilization</strong> Consolidation in the market, achieving the maximum level of profitability</td>
<td>Profitability. System support in equilibrium</td>
<td>Hierarchical type of organizational culture. A cultural space is being formed within which: the existing level of profitability is maintained; costs are minimized, termination of employment is possible; there is a well-developed management system; employees achieve maximum results (quantity and quality) at minimum cost and risk level, etc.</td>
</tr>
<tr>
<td><strong>Recession.</strong> Termination of unprofitable costly production</td>
<td>Liquidation. Liquidation of a part of the production, sale with maximum benefit, both financial and psychological</td>
<td>Transition period to market organizational culture. A cultural space is being formed within which: there is a sale of assets, elimination of losses and reduction of employees, employees are loyal to the enterprise</td>
</tr>
<tr>
<td><strong>Recovery</strong></td>
<td>Entrepreneurial / Liquidation</td>
<td>Market organizational culture. A cultural space is being formed within which: there is a purpose to save the enterprise; actions are being taken to cut costs over the long term; the style of the enterprise is a line that is rigidly carried out on competitiveness, and accordingly - an orientation to the external environment and not to internal affairs; orientation to long-term goals, dedication, willingness to feel temporary discomfort in the conditions and wages, etc.</td>
</tr>
</tbody>
</table>

Source: Designed by the authors

1) Formation stage. In the conditions of market relations, goals are defined through the clarification of ideas about the consumer, his specific needs and their correlation with ideas about the objectives of the enterprise.

2) Stage of consolidation in the market. A cultural space is being formed, within which there is a constant comparison of current goals and the creation of a foundation for the future, a focus on finding and producing goods and services, expanding the range of consumers, suppliers and partners, there is a close interaction of workers and a high degree of purposefulness in achieving their goals, there is dedication to business and dedication to the enterprise and a unique image of the company is established. (Cui, & Hu, 2012).
Thus, developing over time, enterprises supplement the adhocratic culture with a clan culture — a sense of family, a strong sense of unity with the team and personal involvement in the enterprise.

3) The stabilization stage is associated with consolidating what has been achieved, which in turn will require from the enterprise no less, if not more, effort than the goals of the previous stages. This is due to the fact that the problems that need to be addressed at this stage are predominantly internal in nature and are associated primarily with the consolidation of the organizational culture of the enterprise (Makedon 2019). The key values are concentrated around supporting profitability, reliability, speed of service, smoothness of the production process. Thus, standardized rules and procedures, control and accounting mechanisms are important at this stage (Ristic, et. al. 2017).

4) The crisis stage of the enterprise is the most difficult stage of its existence, since this resistance to the crisis and the search for ways out of the critical state is associated with a change in paradigms, values, targets, and thus a change in the existing organizational culture. Hierarchical orientation is gradually complemented by a focus on market culture — competitiveness, the desire to achieve results, and a focus on external relationships (Sulphey, & Alkahtani, 2017).

Thus, at each stage, the enterprise implements a specific development strategy. Looking at the enterprise through the prism of stages allows you to more accurately identify its main target and strategic tasks and orientations (Brown, et. al. 2015). Moreover, it is possible to determine the extent to which they are consistent with the organizational culture of the enterprise, the distinctive characteristics of which are characteristic for each stage (Table 3).

<table>
<thead>
<tr>
<th>Table 3. Assessment of personnel security and organizational culture of the enterprise</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. The most important characteristics of personnel security</strong></td>
</tr>
<tr>
<td>A</td>
</tr>
<tr>
<td>B</td>
</tr>
<tr>
<td>C</td>
</tr>
<tr>
<td>D</td>
</tr>
<tr>
<td>Total:</td>
</tr>
<tr>
<td><strong>2. General leadership style in the organization</strong></td>
</tr>
<tr>
<td>A</td>
</tr>
<tr>
<td>B</td>
</tr>
<tr>
<td>C</td>
</tr>
<tr>
<td>D</td>
</tr>
<tr>
<td>Total:</td>
</tr>
<tr>
<td><strong>3. Employee Management</strong></td>
</tr>
<tr>
<td>A</td>
</tr>
<tr>
<td>B</td>
</tr>
<tr>
<td>C</td>
</tr>
<tr>
<td>D</td>
</tr>
</tbody>
</table>

110
4. Binding essence of the organization

|   | The organization is bound together by dedication and mutual trust. The commitment of the organization is high. |   | The organization is bound together by a commitment to innovation and improvement. It emphasizes the need to be at the forefront. |   | The organization is bound together by an emphasis on achieving the goal and performing the task. Common issues are aggressiveness and victory. |   | The organization is bound together by formal rules and official policy. Support is important for the smooth running of the organization. |
|---|---|---|---|---|---|---|
| A |   |   |   |   |   |   |
| B |   |   |   |   |   |   |
| C |   |   |   |   |   |   |
| D |   |   |   |   |   |   |

Total: 100 100

5. Strategic goals

|   | The organization focuses on humane development. High trust, openness and complicity are persistently maintained. |   | The organization focuses on acquiring new resources and solving new problems. Approbation of new and research opportunities are appreciated. |   | The organization focuses on competitive actions and achievements. The target strength of forces and the desire to win in the market are dominated. |   | The organization focuses on immutability and stability. The most important things are profitability, control and smoothness of all operations |
|---|---|---|---|---|---|---|
| A |   |   |   |   |   |   |
| B |   |   |   |   |   |   |
| C |   |   |   |   |   |   |
| D |   |   |   |   |   |   |

Total: 100 100

6. Criteria for success

|   | The organization determines success based on the development of human resources, teamwork, employee’s enthusiasm for work and care for people. |   | The organization determines success based on ownership of a unique or state-of-the-art product. It is a production leader and innovator. |   | The organization determines success on the basis of winning the market and competitors. Key to success - competitive market leadership |   | The organization determines success on the basis of profitability. Success is determined by reliable supply, smooth schedules and low operating costs. |
|---|---|---|---|---|---|---|
| A |   |   |   |   |   |   |
| B |   |   |   |   |   |   |
| C |   |   |   |   |   |   |
| D |   |   |   |   |   |   |

Total: 100 100

Source: Designed by the authors

Having passed this preparatory stage, you can proceed to the change process - the change program and assess how successfully you were able to carry out this process. The main stages of its implementation: Assessment - changes - assessment (Korsakienė, 2018).

In the assessment tool presented in the Table 3, the answer column has a “Now” header (this means that you rate your organization as it is at present) and “Mostly” (this means that you are rating, which, in your opinion, the same organization should be in order to get to the top of success).

As a result of the interaction of internal subjects of individuals within the system and with the external environment, a common culture is made for this group: a system of basic values, goals, ideas, norms, rules, which implies the development of a strategy (Allen, & Shanock, 2013; Bradley, & Parker 2001) and setting key goals for the most important functional areas and subsystems. As a result, a certain management culture, a labor culture, a production culture, a culture of relations and communications, and, accordingly, an organizational culture of an enterprise, are formed, since all these aspects of the organization of production activities are its structural elements and determine the realization of the goals (Strielkowski et al. 2016; Tvaronavičienė, 2018).

Accordingly, the relationship and the organization level of its structural elements determine the level of the organizational culture of the enterprise, which leads to the formation of a certain cultural space (Koraus, et. al. 2017), within which the enterprise’s production activities aimed at achieving the goals are carried out on the basis of the system of established values.
Taking into account the studied concepts and approaches, the authors propose their own approach to the study of organizational culture and its impact on the personnel security of the enterprise. The case is based on the organizational and personnel indicators of the machine-building enterprise PJSC (private joint stock company) “AutoKrAZ”. Our task was to determine the methodology for quantifying the organizational culture of the enterprise, assess its impact on personnel security, test it in practice and establish a close relationship between the organizational culture of the enterprise and performance indicators based on the results of the study.

To quantify the organizational culture of the enterprise, we developed a questionnaire, the final version of which includes 111 statements, each of which assesses (measures) the state of one of the 18 elements of the organizational culture of the enterprise. This number is quite close to the optimal, because it allows you to provide the necessary depth and coverage of the study, but at the same time does not overload the respondents with a large amount of information, which is important for the reliability of the study. In addition, 3-9 questions were compiled to assess each of the 18 elements (Malhotra, & Murnighan, 2002).

Here we paid special attention to ensuring that each question was assessed by only one of the 18 elements and was minimally related to the others. This is important because the value of each element in quantitative units, obtained as a result of a survey, should show the severity of this particular element, and no other.

Answering each question, the employee was asked to indicate a measure of agreement with each statement on a seven-point scale (the scale of response options can vary from 3 to 7), which is proposed for use by Likert and received the name of a Likert type questionnaire. In our case, the scale had the following gradation: completely disagree (1 point), mostly disagree (2), partially disagree (3), not decided (4), partially agree (5), mostly agree (6), completely agree (7). According to experts, the reliability of the questionnaire increases with the number of response options, but begins to decrease when the number of response options reaches 1 (Balkar, 2015). Thus, a seven-point scale improves the reliability of the study, but does not create difficulties when choosing the right option for answer for respondents.

It should also be noted that the questionnaire included both positive and negative formulations. For example, a question aimed at studying the culture of work organization could sound like this: “The level of labor discipline in your enterprise is quite high,” or so: “In your enterprise, violations of labor discipline often occur.” The alternation of positive and negative statements allows us to trace the truthfulness and attentiveness of the respondents, that is, it increases the reliability of the questionnaire (Prakapvičiūtė, Korsakienė, (2016).

Thus, the resulting assessment tool - the questionnaire presented in Appendix I can be described as follows:

- 111 negative and positive questions;
- multiple response format (seven-point scale);

Questions are grouped thematically into 18 sections, however, they are regrouped randomly in the questionnaire itself.

We calculated the votes for each of the questions as follows: for positively formulated answers, the number of points answered the respondent’s answer, for negatively formulated questions, the number of points was calculated using the formula:

\[(x+1) - y\]  

where, \(x\) – number of possible answer options (in our case - 7), 
\(y\) – number of points corresponding to the answer of the respondent, respectively, the formula has the following form:

\[(7+1) - y\]  

Then, the number of points for each of the 18 elements of the organizational culture at PJSC “AutoKrAZ” was calculated. We summarized these values of cultural elements in the enterprise and received the total number of
culture points.

We calculated the average value of the organizational culture per employee, dividing the total score of the organizational culture of this enterprise by the number of respondents who filled out the questionnaires. Note, the maximum value of the organizational culture of the enterprise in our study is 777 points (111x7 points), that is, a strong organizational culture should correspond to the 777 mark. Accordingly, the higher the score of organizational culture in the studied enterprises is, the higher its level and strength. At the same time, according to the results of the survey, we evaluated the degree of homogeneity of 18 structural elements of culture at each enterprise under study.

The average value of the level of organizational culture of the enterprise:

\[ \overline{C} = \frac{E1 + E2 + E3 + ... + E18}{n} \]  

where, \( E1, E2, E3...E18 \) - elements of the organizational culture of the enterprise; \( n \) - number of respondents.

In order to determine the degree of reliability of the questionnaire compiled by us, and thereby substantiate the legitimacy of its further use to assess the state of the organizational culture of enterprises for its quantitative measurement, we calculated the Cronbach’s \( \alpha \) coefficient (Yousef, 2017). The Cronbach’s \( \alpha \) coefficient - is a statistical indicator that measures the degree of internal homogeneity of the questionnaire, or the internal consistency of all questions. That is, the verification of the reliability of the assessment of 18 elements of an organizational culture using the Cronbach’s \( \alpha \) coefficient (reliability index) shows to which extent the questions, combined into each group, are reliable, internally homogeneous and measure one and the same element (true mark). This step is very important, because in the absence of proper verification of the reliability of questionnaire, all further work may be based on a false basis. The Cronbach’s \( \alpha \) was calculated in MS Excel for each group of questionnaire questions, evaluating one of the elements of the organizational culture of the PJSC “AutoKrAZ” using the following formula:

\[ \alpha = \left( \frac{k}{k-1} \right) \left( 1 - \frac{\sum \sigma_i^2}{\sigma_{sum}^2} \right) \]  

where, \( k \) – number of questions in the group responsible for assessing the element of organizational culture \( \sigma_i^2 \) – variance for each individual question in this group \( \sigma_{sum}^2 \) – variance for the sum of the values for all questions in this group.

The calculated values of the Cronbach’s \( \alpha \) coefficient are shown in table 4.

Since all the values of the Cronbach’s \( \alpha \) coefficient for each group of questions are greater than 0.7, the reliability of the questionnaire developed by us is high and each question measures exactly the element of culture that it should measure. Here we used the next rule.

If the Cronbach’s \( \alpha \) coefficient for a group of questions that determine the level of organization of each element:

- is equal to 1.00, then all the questions that assess this element are absolutely reliable and measure it;
- is more than 0.70, then the reliability of this group of questions is sufficient;
- is equal to 0.60, then the level of reliability is as minimal as possible, and accordingly, it is necessary to finalize the question before the test set can be used for large-scale research (Van Vianen, et. Al. 2011).
Table 4. The values of the Cronbach’s α coefficient

<table>
<thead>
<tr>
<th>№</th>
<th>Element of organizational culture</th>
<th>Cronbach’s α</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Clarity of goals and focus on their achievement</td>
<td>0.807</td>
</tr>
<tr>
<td>2</td>
<td>Focused production activity (strategic orientation)</td>
<td>1.000</td>
</tr>
<tr>
<td>3</td>
<td>Management style</td>
<td>0.839</td>
</tr>
<tr>
<td>4</td>
<td>Level of formality</td>
<td>0.775</td>
</tr>
<tr>
<td>5</td>
<td>Ability to resolve conflicts</td>
<td>0.803</td>
</tr>
<tr>
<td>6</td>
<td>Personnel orientation</td>
<td>0.704</td>
</tr>
<tr>
<td>7</td>
<td>Internal integration</td>
<td>0.778</td>
</tr>
<tr>
<td>8</td>
<td>Participation of employees in the decision-making process</td>
<td>0.785</td>
</tr>
<tr>
<td>9</td>
<td>Delegation of authority</td>
<td>0.792</td>
</tr>
<tr>
<td>10</td>
<td>Commitment to common goals</td>
<td>0.784</td>
</tr>
<tr>
<td>11</td>
<td>Employee remuneration system</td>
<td>0.882</td>
</tr>
<tr>
<td>12</td>
<td>Management of the system of values</td>
<td>0.771</td>
</tr>
<tr>
<td>13</td>
<td>Customer and high quality orientation</td>
<td>0.902</td>
</tr>
<tr>
<td>14</td>
<td>Orientation to changes</td>
<td>0.781</td>
</tr>
<tr>
<td>15</td>
<td>Learning orientation</td>
<td>0.717</td>
</tr>
<tr>
<td>16</td>
<td>Labor conditions, discipline and labor protection</td>
<td>0.895</td>
</tr>
<tr>
<td>17</td>
<td>Level of production organization</td>
<td>0.926</td>
</tr>
<tr>
<td>18</td>
<td>Technical level of production</td>
<td>0.895</td>
</tr>
</tbody>
</table>

Source: calculation authors

Thus, on the basis of the calculations, we statistically proved the reliability of the questionnaire and the possibility of its further use for conducting similar studies.

Next, after conducting a correlation-regression analysis, we:
- determined the relationship of 18 structural elements of the organizational culture among themselves, by calculating the matrix of paired correlation coefficients and determining the coefficients of determination ($R^2$);
- built the equation of paired linear regressions, allowing to establish in which direction and by what amount the effective element changes when the factor element changes by 1 point;
- statistically selected elements that determine the organizational culture of the enterprise by identifying a close correlation relationship between the organizational culture and these elements; built the equation of multiple linear regression of the dependence of culture on the selected elements, which determine it to a greater degree. In particular, first in MS Excel we built a matrix of paired correlation coefficients between the 18 elements of the organizational culture, which we considered as factor indicators for the effective feature - the organizational culture of the enterprise.

In order to assess the absolute influence (in points) of one cultural element on another, we assessed paired linear regressions. Mathematically, the task was reduced to finding an analytical expression, and it is the best way to describe the connection of one cultural element with another in the form:

$$y = a + bx$$

where $y$ – effective feature

$x$ – factor feature.

The coefficient $b$ shows in how many points the effective feature changes with an increase in the factor feature by 1 point.

For example, for element 1 “clarity of goals and focus on their achievement”, factor features are element 2 “focused production activity”, element 8 “employee participation in decision making” and element 13 “manage-
ment of the system of values”. Looking at the value of b in Appendix 10, we can conclude that by increasing each of these elements by 1 point, element 1 “clarity of goals and focus on their achievement” will increase by 1.20; 1, 0.47, respectively.

The matrix of paired correlation coefficients also allowed us to answer the question, which elements largely determine the organizational culture of the enterprise. According to the calculations, there are 12 of them and they are all listed in Table 5, where the values of the correlation coefficients, the determination coefficients and the value of b from the regression equations are presented. The value of b in this case shows that with the increase, for example, of element 14 “orientation to changes” by 1 point, the value of the organizational culture of the enterprise will increase by 22.68 points.

### Table 5. Factor features that determine personnel security and organizational culture of the PJSC “AutoKrAZ”

<table>
<thead>
<tr>
<th>Element No.</th>
<th>Factor feature</th>
<th>Correlation coefficient ($r$)</th>
<th>Determination coefficient ($R^2$)</th>
<th>Value of $b$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Element 14</td>
<td>Orientation to changes</td>
<td>0.90</td>
<td>0.81</td>
<td>22.68</td>
</tr>
<tr>
<td>Element 2</td>
<td>Focused production activity</td>
<td>0.88</td>
<td>0.77</td>
<td>2.16</td>
</tr>
<tr>
<td>Element 17</td>
<td>Level of production organization</td>
<td>0.87</td>
<td>0.74</td>
<td>9.05</td>
</tr>
<tr>
<td>Element 18</td>
<td>Technical level of production</td>
<td>0.86</td>
<td>0.74</td>
<td>11.76</td>
</tr>
<tr>
<td>Element 7</td>
<td>Internal integration</td>
<td>0.85</td>
<td>0.72</td>
<td>19.85</td>
</tr>
<tr>
<td>Element 1</td>
<td>Clarity of goals and focus on their achievement</td>
<td>0.83</td>
<td>0.69</td>
<td>15.88</td>
</tr>
<tr>
<td>Element 15</td>
<td>Learning orientation</td>
<td>0.83</td>
<td>0.68</td>
<td>23.17</td>
</tr>
<tr>
<td>Element 16</td>
<td>Labor conditions, discipline and labor protection</td>
<td>0.73</td>
<td>0.53</td>
<td>10.71</td>
</tr>
<tr>
<td>Element 3</td>
<td>Management style</td>
<td>0.70</td>
<td>0.50</td>
<td>10.21</td>
</tr>
<tr>
<td>Element 10</td>
<td>Commitment to common goals</td>
<td>0.70</td>
<td>0.50</td>
<td>23.24</td>
</tr>
<tr>
<td>Element 12</td>
<td>Management of the system of values</td>
<td>0.70</td>
<td>0.50</td>
<td>15.57</td>
</tr>
<tr>
<td>Element 13</td>
<td>Customer orientation</td>
<td>0.68</td>
<td>0.50</td>
<td>18.32</td>
</tr>
</tbody>
</table>

Source: calculation authors

However, the results obtained do not mean that the remaining 6 elements do not determine the organizational culture of the enterprise. Accordingly, we believe that all the 18 elements that have been identified define the organizational culture and are its structural elements.

Further, in order to solve the problem of selecting factor features and the problem of multicollinearity, we conducted a static analysis using the method of step-by-step regression (Korlén, et. al. 2018). The concept of this method lies in the sequential inclusion of factors in the regression equation and the subsequent verification of their significance. As a result, the following equation was obtained:

$$C = \alpha_0 + \alpha_1 E_1 + \alpha_{14} E_{14} + \alpha_{18} E_{18}$$  \hspace{1cm} (7)

where, $C$ – organizational culture of the enterprise

$\alpha_0$ – constant,

$\alpha_1, \alpha_{14}, \alpha_{18}$ – coefficients of regression,

$E_1, E_{14}, E_{18}$ - elements defining organizational culture (factor features).

This equation of the dependence of culture on factor features has taken the following form:

$$C = -15.04 + 5.12E_1 + 4.56E_{14} + 5.93E_{18}$$  \hspace{1cm} (8)
Thus, as a result of the correlation and regression analysis, we found that there is a high connection strength between the selected factor features and the organizational culture of PJSC “AutoKrAZ”, since the multiple correlation coefficient $r$ is 0.98. At the same time, 96.5% of changes in the organizational culture of an enterprise are due to changes in element 1, “clarity of goals and focus on their achievement,” element 14, “enterprise’s ability to respond to changes,” and element 18, “technical level of production”. In particular, the regression coefficients show that with an increase in element 1 “clarity of goals and orientation on their achievement” by 1 point, the organizational culture of the enterprise will increase by 5.12 points, with an increase in element 14, “orientation to changes” by 1 point, the organizational culture of the enterprise will increase by 4.56 points, with an increase in element 18 “technical level of production” by 1 point, the organizational culture of the enterprise will increase by 5.93 points (Herzberg, 2017).

When checking the significance of the equation based on Fisher’s F-criterion, in particular, when comparing the calculated value $F = 82.9$ and the critical value $F_{Kpum} = 3.86$ at a significance level of 0.05, we found that the equation is significant and the relationship is recognized as significant.

In order to assess the statistical significance: the impact of enterprise organizational culture on personnel security of the enterprise and production activity, we also conducted a correlation-regression analysis. Three indicators of efficiency were taken as a basis: labor productivity and profitability of the main activity.

As a result of the analysis, we found a fairly close relationship between the organizational culture of the enterprise and labor productivity (Fig. 2). This is indicated by a correlation coefficient of $r = 0.67$. At the same time, 45% of changes in labor productivity are due to changes in the organizational culture of the enterprise ($R^2 = 0.45$).

![Fig. 2. Relationship between productivity and organizational culture of the PJSC «AutoKrAZ»](image)

*Source:* Designed by the authors

We built the equation of paired linear regression of the form:

$$\Pi = a_0 + bx_C$$

where $\Pi$ – labor productivity (effective feature);
$a_0$ – constant;
$b$ – coefficient of regression;
\[ C \text{ – organizational culture of the enterprise (factor feature), and obtained the following equation for the dependence of labor productivity on the organizational culture of the enterprise:} \]

\[ \Pi = -314.18 + 1.59C \]  \hspace{1cm} (10)

The regression coefficient \( b \) in this case shows us that with an increase in the value of the organizational culture of the enterprise by 1 point, the indicator of labor productivity increases by 1.60 thousand UAH / people.

5. Discussion

We also determined confidence intervals for labor productivity, as a factor in personnel shortage when the organizational culture of the enterprise changes by 1 point. Thus, if the organizational culture of the enterprise changes by 1 point with a probability of 0.95, labor productivity may change to a value from the interval (0.41; 2.79).

As a result of the analysis, we found a close relationship between the organizational culture of the PJSC “AutoKrAZ” and the profitability of the main activity. This is evidenced by the correlation coefficient \( r = 0.70 \). At the same time, 50% of the change in the profitability of the main activity of the enterprise is due to a change in its organizational culture \( R^2 = 0.50 \).

We built the equation of paired linear regression of the form:

\[ R = a_0 + bxC \]  \hspace{1cm} (11)

where \( R \) – profitability of the main activity (effective feature);
\( a_0 \) – constant;
\( b \) – coefficient of regression.

\( C \) – organizational culture of the enterprise (factor feature), and obtained the following equation for the dependence of labor productivity on the organizational culture of the enterprise:

\[ \Pi = -31.3 + 0.08C \]  \hspace{1cm} (12)

Regression coefficient \( b \) shows that with an increase in the organizational culture of the enterprise by 1 point, the profitability index of the main activity will increase by 0.08%. We also set confidence intervals for the profitability of the main activity when the organizational culture of the enterprise changes by 1 point. (Weiner, 2018). Thus, if the organizational culture of an enterprise changes by 1 point with a probability of 0.95, the profitability of the main activity may change to a value from the interval (0.03; 0.14) (Fig. 3).
We also set confidence intervals for the profitability of sales when the organizational culture of the enterprise changes by 1 point. Thus, if the organizational culture of an enterprise changes by 1 point with a probability of 0.95, the return on sales may change to a value from the interval. (0,03; 0,13).

**Conclusions**

Thus, the formation of the organizational culture of the enterprise is associated with the formation of a system of elements that determine the functioning of the enterprise in all areas, ranging from the strategy for its development to the process of fulfilling its functional responsibilities by each individual in order to ensure proper personnel security. Having formed, the organizational culture of the enterprise determines the further personnel and production development of the enterprise. That is, how the enterprise adapts to the external environment, which is constantly changing, what goals it sets, what methods it uses to achieve its goals, is determined by the level of the established organizational culture of the enterprise, which affects the spiritual and physical development of individuals as part of the organization of production activities of the enterprise.

As part of the case study, the analysis shows that there is a close positive correlation between the organizational culture of the PJSC “AutoKrAZ” and the indicators of the efficiency of its production activities, that is, the higher the level of organizational culture of the enterprise is, the higher the indicators of the efficiency of its production activities. In this case, we believe that:

- the strong organizational culture is a competitive advantage that enhances the ability of the enterprise to identify personnel capabilities to shape personnel security activities;
- the strong organizational culture enhances the efficiency of industrial enterprises in conditions of intense competition, since it allows them to coordinate all actions taking into account the conditions of the external environment in which the enterprise operates.
References


Cameron, K.S., Quinn, R.E. (2011). Diagnosing and changing organizational culture: Based on the competing values framework. San Francisco: A Wiley Imprint. URL: https://pdfs.semanticscholar.org/9095/28bece85d540be496170045c1becc74ab856.pdf


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THE WORLD MARKET OF INTELLECTUAL PROPERTY OBJECTS AND INTERESTS OF NATIONAL SECURITY OF COUNTRIES

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Abstract. This scientific paper provides an analysis of the formation and functioning of intellectual property objects. The influence of creation of intellectual property on the level and manifestations of national security of the countries of the world was determined. An analytical study of the current state and leadership in the world market of intellectual property objects has been conducted, the process of protection of intellectual rights and national interests of countries has been identified. Recommendations for combining the concept of national security and the intellectualization of world trade have been formed.

Keywords: national security; intellectualization of world trade; intellectual property; patent applications; international patent system; protection of intellectual rights; internationalization of the world economy


JEL Classifications: F01; F19; F20

1. Introduction

One of the most characteristic phenomena of the XXI century is the intellectualization of world trade, that is, the growth of the share of the “intellectual” component in goods and services. The intellectual property rights (IP) has long been an important element of economic development and the object of national security in developed countries, it is this group of countries most actively advocating for strengthening the protection of IP rights and the protection of national security within both bilateral and regional and multilateral treaties.

Most developing countries, unlike the developed ones, historically have not focused on the formation of an IP rights protection system, but the deepening internationalization of the world economy has led to the extreme regulation of IP rights within the multilateral trading system and national security became extremely important for the whole world community.

2. Literature Survey

Currently, a certain theoretical and practical scientific base has been accumulated on this issue. The study of the role of innovation and intellectual capital in the economy at the macroeconomic level was carried out by
such scholars as (Acur & Englyst, 2006; Ahmad & Schroeder, 1996; Christensen & Bower, 1996; Fink, 2001; Nooriaiee & Pour; 2013; Sabherwal & Chan; 2001; Taubman, et al., 2012; Sagiyeva et al., 2018; Ma et al., 2018; Zhou, Ch., 2018; Tvaronavičienė, 2019; Koval et al., 2019; Bezpalov et al. 2019; Petrenko et al., 2019).

The significance and the need for a deep analysis of this problem is strengthened by the constant expansion of the range of issues affecting the IP rights (activities of mediators: exchanges, auctions, IP clearing companies, the rapid development of Technology Transfer Offices and adherence to national interests and security).

The aim of the study is to comprehensively study the features of the world market of the IP objects and support of national security of countries in the conditions of the world economy system globalization.

3. Methods

The development of the system of protection of IP rights and national security can not be achieved without an analysis and conclusions about how the liberalization of trade in intellectual property objects contributes to the development of world trade. These issues are relevant for the Russian economy, since the existing intellectual potential and further innovative development of the economy can become the source of obtaining competitive advantages in the world arena through the effective use of IP objects. The intellectual property acquires the form of intangible assets through the IP system and becomes an integral part of the trade in the knowledge economy (Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement); Tvaronavičienė, 2018). The most important indicators of the world market of intellectual property objects are:

- purchase and sale of licenses;
- payment of royalties;
- number of patent applications;
- number of registered trademarks;
- registration of other IP objects.

In order to assess the state of the world market of intellectual property objects, it is necessary to consider each of these components.

4. Results

The statistical data provided by the WTO allow us to trace the dynamics of changes in payments for the use of intellectual property objects in a regional context and to identify IP regions that are the most involved in the international trade (Table 1).

<table>
<thead>
<tr>
<th>Indicator / Region</th>
<th>Volume, billion US dollars</th>
<th>World share, %</th>
<th>Changes, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>240</td>
<td>290</td>
<td>295</td>
</tr>
<tr>
<td>Northern America</td>
<td>96</td>
<td>124</td>
<td>128</td>
</tr>
<tr>
<td>South and Central America</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Europe</td>
<td>103</td>
<td>123</td>
<td>120</td>
</tr>
<tr>
<td>EU (28)</td>
<td>85</td>
<td>103</td>
<td>99</td>
</tr>
<tr>
<td>CIS</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Africa</td>
<td>1</td>
<td>&gt;0.01</td>
<td>&gt;0.01</td>
</tr>
<tr>
<td>Near and Middle East</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Asia</td>
<td>35</td>
<td>39</td>
<td>42</td>
</tr>
</tbody>
</table>

Source: Developed by the authors according to the source World trade statistical review, 2018
So, the main payments for the use of intellectual property belong to North America and Europe - about 82% of all payments in total in 2017. Even though the shares of North America and Europe for the given period (2012-2017) has decreased insignificantly (by 1.6 and 1.5% respectively), positive growth rates allow us to conclude that North America and Europe will preserve the leading position among exporters in the world IP market in the near future and will continue lobbying their interests in the field of intellectual security in the formation of an international system for regulation of trade in IP objects, first of all, through the signing of preferential trade agreements (PTA).

It should be noted the growing role of Asian countries, whose growth was 2.9% from 2012 to 2017. The analysis of the dynamics of statistical data confirms the conclusion that since 2002, the role of this region in the world trade in IP has increased significantly, and in 2016 there was a significant increase (15%), compared with the region of North America, which has zero dynamics (World trade statistical review, 2018). Nevertheless, a sharp deceleration in growth was observed in Asia in 2017 compared to the previous year, which can be explained by the intensification of the regimes of IP trade in relation to this region, and, as a consequence, the decline in participation in world trade in intellectual property and the beginning of trade disputes between the United States and China (Drobyazko S., 2017; Drobyazko S., etc., 2019).

The positive dynamics was observed in the Near and Middle East, South and Central America and CIS countries. However, there was reduction of payments for the use of intellectual property in 2017, mainly in the countries of the Middle East, where the reduction was 12% compared with the previous year. The negative growth rates in 2017 were also observed in the African Region (-9%), where this trend is long term during 2012-2017, indicating the passive participation of the region in international trade in IP objects and fall in IP security of countries.

So, the world leaders among recipients of license fees and royalty payments are mainly developed countries such as USA, Japan, South Korea and, of course, the EU (Fig. 1).
We note that the share of the US, EU and Japan is a total of 86% of global revenues from license fees and royalties. The China share among global recipients is not so great and is less than one percent. China is ranked fourth among the major world payers of royalties and license fees, which makes it the largest consumer of IP in developing countries and countries actively form national intellectual security system (Table 2).
Table 2. The main countries payers of royalties and license fees in 2017

<table>
<thead>
<tr>
<th>No.</th>
<th>Importer</th>
<th>Amount of payments, mln. US dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>EU</td>
<td>143478</td>
</tr>
<tr>
<td>2</td>
<td>US dollars</td>
<td>42141</td>
</tr>
<tr>
<td>3</td>
<td>Singapore</td>
<td>22230</td>
</tr>
<tr>
<td>4</td>
<td>China</td>
<td>22614</td>
</tr>
<tr>
<td>5</td>
<td>Japan</td>
<td>20916</td>
</tr>
<tr>
<td>6</td>
<td>Switzerland</td>
<td>12351</td>
</tr>
<tr>
<td>7</td>
<td>Canada</td>
<td>10229</td>
</tr>
<tr>
<td>8</td>
<td>South Korea</td>
<td>10369</td>
</tr>
<tr>
<td>9</td>
<td>Russia</td>
<td>8039</td>
</tr>
<tr>
<td>10</td>
<td>Thailand</td>
<td>3971</td>
</tr>
</tbody>
</table>

Source: WIPO Copyright Treaty (WCT)

In addition, we can see from Table 2 that the number of world taxpayers does not qualitatively differ from the world’s recipients of license fees and royalty payments, with the exception of some nuances. Among the paying countries, unconditional leadership belongs to the European Union ($143,476 million US dollars), and not to the USA ($42,141 million dollars), which occupy only the second position.

On the basis of these data, it is possible to make a logical conclusion that it is precisely such states as the US, EU countries and Japan that effectively manage existing intellectual property objects on a global scale, have stable positions in the field of national security, and companies of these countries competently use the competitive advantages created both on the international and on the domestic market. According to WIPO statistic data, the highest number of applications for patent protection is noted in high-income countries, due to the orientation of most of these countries towards the innovative type of economic development. However, one can not ignore an important tendency: starting in 2012, there is a sharp increase in the number of applications from the group of countries with a higher incomes than average and a reduction of the gap with the leaders of the countries by this indicator (Fig. 2). To explain this phenomenon, a deeper analysis of the countries of the world and IP objects should be conducted.

![Fig. 2. Number of patent applications by country group (including PCT applications) in 2003-2017](source: Developed by the authors according to the source World Intellectual Property Indicators, 2018)
Data presented in Fig. 2 confirm that in recent times international cooperation has intensified in some areas. This trend is most clearly represented at the level of private international patenting. For 1998 to 2016, the number of applications for a patent, including in accordance with the International Patent Cooperation Treaty (PTC), has consistently increased, with the exception of only the crisis of 2009. At that, the United States became the undisputed leader in the number of international applications filed under the PCT procedure by the end of 2017. Figure 3 shows data from other countries that are leading on this indicator in 2017.

Fig. 3. Top 10 world leaders in 2017 (except for USA) that filed an international application under the PCT procedure, % (the volume of applications for international patent from USA (100%) was taken as the basic indicator)

Source: Developed by the authors according to the source World Intellectual Property Indicators, 2018

Fig. 3 graphically shows that the demand for international protection of the IP objects and formation of the intellectual safety using the patenting system is basically formed by the developed countries, which companies lead active activities in the world market. In addition, it is also promoted by regulatory systems based on the international agreements and recommendations. In addition, fig. 3 shows that the list is provided mostly by the countries with the high level of income (China is the exception) The most active use of the international patent system, with the exception of the USA, was demonstrated by the representatives of Japan, Germany and China, while the number of applications from Japan exceeds similar figures in Germany more than 2 times, but still does not reach the level of the United States.

The statistical analytics presented at the end of 2017 does not reflect significant changes among the number of those most actively using the system of patenting of countries, except perhaps one important fact, clearly shown in Fig. 4.
So, from 2013 to 2014, China became the world leader in the number of patent applications received, being ahead of the USA. At the same time, analyzing the growth rates of this indicator in the given countries for 2013-2017, and given the significant figures shown by China, one can assume that China’s leadership in the near future will intensify (Table. 2).

**Table 2.** The growth rates of the number of patent applications in the USA and China over 2013 to 2017

<table>
<thead>
<tr>
<th>Year / Indicator</th>
<th>Number of applications, pieces</th>
<th>Growth rates, %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>US dollars</td>
<td>China</td>
</tr>
<tr>
<td>2013</td>
<td>490226</td>
<td>391177</td>
</tr>
<tr>
<td>2014</td>
<td>503582</td>
<td>526412</td>
</tr>
<tr>
<td>2015</td>
<td>542815</td>
<td>652777</td>
</tr>
<tr>
<td>2016</td>
<td>571612</td>
<td>825136</td>
</tr>
<tr>
<td>2017</td>
<td>578802</td>
<td>928177</td>
</tr>
</tbody>
</table>

*Source:* Developed by the authors according to the source World Intellectual Property Indicators, 2018

A similar situation is observed in the number of applications for trademarks: in 2017, China received almost 5 times more applications than the US Patent and Trademark Office. So, we can conclude that China has not only become a world center for the protection of intellectual property, but also maintains high growth rates, contributing to consolidating this leadership and strengthening the level of national security. Exceptions can only serve as indicators of the number of applications for registration of industrial designs, which show a negative growth rate, but this trend is characteristic not only for China, but also for the world as a whole.

Another global trend is the increase in the number of patent applications for inventions from 1.4 million in 2003 to 2.14 million in 2013, the first time exceeding the figure of 2 million. Today, according to the latest data of WIPO (World Intellectual Property Organization), more than 2.7 million patent applications were filed in 2017. Such significant growth took place in several stages: in 1980s, largely at the expense of Japan, the leadership later passed to the countries of Europe and the United States of America, then in the 1990s the Republic...
of Korea joined them and, relatively recently, but demonstrating unprecedented growth rates, as previously presented, China.

At the same time, in 2002 and 2009, there was a decline in the world - the reduction in the number of applications for a patent was about 1.1% and 3.5% respectively, compared to the previous year, due to the reduction of world GDP and crisis phenomena in the world economic system, first of all - the stagnation of industrial production, which has a direct correlation with the intensification of patent activity - but in subsequent years there was a significant increase, in 2017 by 4.5%. Thus, the long-term trend in changing the number of applications for patent protection in the new millennium remains upward, which is due to a larger increase in the number of applications filed with US Patent Offices and, in the first place, China (The Global Information Technology Report).

There are several reasons for such a rapid growth of patent operations, including those that are specific to certain countries and industries. However, two key factors can be distinguished (Yang et al., 2015).

First, the analysis of such categories of global patents as “initial applications”, which means the registration of a practically new invention, and “further applications” - applications for the same invention in different countries - shows that the latter provide a little more than half of this growth over the last 12-15 years.

Secondly, given the pace of change in world expenses on R&D, we can conclude that the growth of patenting was mainly due to investment in knowledge in the world as a whole. However, trends in patenting and spending on R&D differ markedly in different countries and regions, with important features of conduction of innovation activities by resident companies (Lii & Kuo, 2016).

The rapid increase in the number of patent applications, in turn, raises concerns about the growth of patent portfolios of individual TNCs that are eligible for a priority application and impede innovation by jointly-owned companies, including small and medium-sized businesses (joint innovations), which leads to slowing down scientific and technological progress and the development of the world economy, given the concentration of advanced technologies in the hands of several world corporations.

The world trade in patents shows robust growth in the field of so-called sophisticated technologies. Economists define complex technologies, such as those that consist of a multitude of individual inventions with the possibility of a broad patent holder, that is, those that include several patents, the owners of which are often several individuals. For example, sophisticated technologies include the majority of ICTs, which have been experiencing rapid growth over the past three decades. However, economic research shows that the rapid growth of patenting in the field of sophisticated technologies and subsequent license trading are due to changes in the company’s innovative strategies (Limba, et al., 2019). Patents allow companies to specialize in any area, which in turn allows them to be both more efficient and innovative. In addition, patents allow companies to flexibly manage their intellectual resources: determine what should be kept in secret and what can be sold to maximize profits while maintaining an appropriate level of security (Zambon, 2017).

The research in the field of semiconductor manufacturing showed that firms are actively expanding the patent portfolios. One of the reasons for this is the desire of the company to provide freedom of activity in its innovation space and acquire ownership of intellectual property. Another factor motivating the formation of patent portfolios is the desire of companies to strengthen their positions in the negotiations in harmonizing the conditions of mutual licensing, which are often needed for the commercialization of new technologies.

In addition to this industry, the growth of patent portfolios is noted in other high-tech sectors of ICTs, in particular in the field of telecommunications, software, audio and video production, optics and the relatively young sectors of smartphone and tablet computers. However, despite the fact that these “portfolio races” often occur in industries that are an important driving force behind technological progress, there are fears that they can slow down or even counteract cumulative innovation processes. In particular, entrepreneurs with a large number of
cross-patent rights may refuse further research or postpone plans for the commercialization of promising technologies (Stankevičius & Lukšaitė, 2016).

However, with a very thorough study of the relationship between patenting and the intensification of international trade in licenses, very little attention is paid to the study of demand for the protection of trademarks. According to the authors, this study may contribute to obtaining important information about the world of IP objects trading, given the tendency to intellectualize the economy and the growing role of this IP object.

As presented in Fig. 5, there was noted a reduction in the number of applications for registration of trademarks (absolute growth rates made up 5%) only in crisis 2009, however, in 2012 there is a sharp increase in this indicator (an increase of 9%) and a significant excess of the pre-crisis level already in 2013 with further growth.

![Fig. 5. The dynamics of the number of applications for trademarks in the world, 2004-2016](source)

*Source:* Developed by the authors according to the source World Intellectual Property Indicators, 2018

Today’s realities are that more than half of global applications for trademark registration go to countries with middle and low income, Latin America and Caribbean countries are slightly expanding, and patent offices in Asia are prominent recipients of applications (Leese & Wittendorp, 2017).

For a more in-depth analysis of the global demand for trademark protection, it’s worth considering how the same indicator has changed specifically for markets in some countries.

The active development in the field of trademark protection was received by the Japanese Patent Office at the beginning of the 1970’s, and in the US Department of Patents and Trademarks in the middle of the decade, other countries began to develop the institutes and mechanisms for registration of trademarks later (Schuelke, 2018). Fig. 6 shows the dynamics of filing applications for registration of trademarks in some patent offices in the world.
As can be seen from the data presented, the Japanese Patent Office was the unconditional leader in the number of applications for trademarks received by the mid-1990s. However, in 1995, there were roughly the same level of applications in the departments at once in three countries: USA, Japan and China. After that, since 2001, there has been a reduction in applications in Japan, and China becomes the world leader in the number of received trademark applications, and today, as in the case of patent applications, it significantly outpaces the US Patent Office for this indicator.

This is partly due to the policy pursued by the Chinese government, as well as the high rates of growth of the country’s economy during this period. Given the current level of globalization of the world community, the crisis of 2008-2009 significantly affected the number of applications received by the Chinese department (negative growth rate of 2% was observed), however, the pre-crisis level was quickly reached, and there has been a sharp increase in the number of applications for registration of trademarks since 2013.

Compared to Chinese and American departments, similar departments from Brazil, Japan and India receive substantially fewer applications, but these economies are among the 20 leading countries in the world in terms of the number of patent applications (Patent Cooperation Treaty, PCT).

Thus, the data presented in Figures 5 and 6 allows us to conclude that increased activity in the field of registration of trademarks in high-income countries began at 10-15 years earlier than in middle-income countries, but a sharp increase in the number of applications is seen in the last group of countries, and the global demand for trademarks continues to grow steadily since 2009. This trend can serve as a factor in intensifying the participation of these countries in the worldwide turnover of IP objects and strengthening the level of national security.

However, it should be noted some difficulties and mistakes in the comparison of data from the patent offices of the world due to the difference in the institutional mechanisms of registration of trademarks, in particular - dif-
ferences in the system of filing applications. There is a system for filing applications for a single class of goods and services (in the WIPO terminology it is called a single-class filling system) and a system for application for several classes of goods and services (in WIPO terminology, multi-class filling system). In the case of use of the first one (one class), the applicant shall submit a separate application for each class of goods and services in which the trademark will be used. Such a system is used, for example, in Brazil and China. The second system (the multi-class one) is characterized by the fact that the applicant submits a single application, which specifies all classes requiring protection (Jorfi et al., 2017; WIPO Copyright Treaty (WCT). This mechanism is used in most European countries, USA, Japan, and others.

So, direct comparison of the number of applications in different departments, in other equal conditions, will always outweigh the amount for the benefit of countries that use the system for application for a single class of goods and services, that is, such a comparison gives false results. This can be avoided by comparing volumes based on the number of classes on which applications are submitted, which allows the WIPO statistical database system to be used for analysis (Dzwigol, H., Aleinikova, O., Umanska, Y., Shmygol, N., & Pushak, Y., 2019).

Another problem in comparative analysis of statistical data on the number of applications submitted for registration and protection of a trademark is the requirement for proof of use of the trademark before registration. In countries where legislation is loyal and this requirement is not forthcoming, manufacturers can file multiple trademarked applications without planning to use them immediately, or just creating favourable conditions for the market entry of similar goods, increasing barriers to entry for competitors (Schwab, 2016).

Among the important factors influencing the number of applications for trademarks, it is necessary to distinguish the rates of economic growth, which are directly correlated with the growth of investment in innovation and, as a consequence, leading to activation of the activities in the field of IP. Obviously, by creating an innovative product, the company seeks to maximally protect its product, while using the symbiosis of various ways of protection of intellectual property: after the expiration of the patent, trademarks permit the life cycle of the patented product to be extended (Holovatyi, M., 2014).

It should be noted that in the process of deepening industrialization in a group of developing countries and gradually increasing the share of service sectors in the economies of low and middle income countries, the use of the registration system, including international trademarks, is being developed and intensified. The growth rates are mainly due to the development of business, communications and financial services, as well as health care services. However, the share of applications for trademarks on products still exceeds the share of applications for trademarks for services, and this situation is noted even in countries that are in the post-industrial stage of economic development with a high proportion of service sectors (USA, UK, Australia, France, Germany, etc.) (Isoda, 2018). At the same time, more applications for trademarks are served abroad.

Due to the globalization of the world economy, the development of the Internet and the pursuit of economic activity in the virtual space has a special impact on the growth of the use of trademarks. Manufacturers understand that without being able to evaluate the goods physically, the buyer will try to employ other methods to check the quality and characteristics of the intended purchase, and a well-known and familiar trademark can play a decisive role in making a decision (Nielsen et al., 2017).

With regard to the world market of such objects as useful models and industrial designs, then Table 4 presents the main participants in this market and the demand that they put on these objects.
Table 4. Geographical division of applications for IP in 2016

<table>
<thead>
<tr>
<th>Country</th>
<th>Patents</th>
<th>Trademarks</th>
<th>Industrial designs</th>
<th>Useful models</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>928177</td>
<td>2104534</td>
<td>564555</td>
<td>868511</td>
</tr>
<tr>
<td>US dollars</td>
<td>578802</td>
<td>341902</td>
<td>35378</td>
<td>-</td>
</tr>
<tr>
<td>Germany</td>
<td>65965</td>
<td>70554</td>
<td>7392</td>
<td>14741</td>
</tr>
<tr>
<td>Japan</td>
<td>325989</td>
<td>124602</td>
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<td>7095</td>
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<td>South Korea</td>
<td>210292</td>
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<td>64574</td>
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<tr>
<td>France</td>
<td>16533</td>
<td>90674</td>
<td>4782</td>
<td>424</td>
</tr>
<tr>
<td>Italy</td>
<td>9382</td>
<td>40016</td>
<td>1434</td>
<td>2497</td>
</tr>
<tr>
<td>UK</td>
<td>23040</td>
<td>54525</td>
<td>5084</td>
<td>-</td>
</tr>
<tr>
<td>India</td>
<td>42854</td>
<td>222235</td>
<td>9309</td>
<td>-</td>
</tr>
<tr>
<td>Total in the world</td>
<td>2680900</td>
<td>7449394</td>
<td>1138400</td>
<td>948900</td>
</tr>
</tbody>
</table>

*Source*: Developed by the authors according to the source World Intellectual Property Indicators, 2018

Totally these countries have: 83% of all applications for patents, 44% of applications for trademarks, 63% of applications for industrial designs. At the same time, China accounted for 49% of world demand for industrial designs and 92% of world demand for utility models. So, the largest Chinese TNCs, along with several national universities, are leaders in the world market for IP objects.

5. Discussion

It is worth noting that not only Chinese but also large multinational companies around the world seek to protect IP abroad, which has been reflected in the increase in the number of international applications. The growth in demand for services and the expansion of the geographical coverage of the Patent Cooperation Treaty system, as well as Madrid (trademark registration) and the Hague systems (registration of industrial prototypes) (European Innovation Scoreboard (2018).

To summarize, there are several reasons for the growth of the world market of IP objects. One of them is an increase in the role of intellectual property in international economic relations. This tendency promotes the aspiration of the right holders to expand the geographical coverage of the application and, of course, the protection of IP objects. In addition, the growth of world trade in industrial property is due in part to the involvement of an increasing number of countries in world trade and as a consequence of the registration of the same invention in different countries (“secondary” applications) (Bigo, 2001). The globalization has contributed to the strengthening of IP protection regimes in many countries and the emergence of special interest of economic entities in enterprises that are based on knowledge and information.

The development of technologies (nanotechnology, bioengineering, ICT, etc.) and an increase in the domestic demand of innovative enterprises, the behaviour of which reflects a change in the role of intellectual property in the economy at the national level is equally important. The growth of R&D expenditures in certain industries, coupled with a reduction in the lifecycle of many products, provided additional incentives for companies to use existing IP rights as competitive advantages (International Convention for the Protection of Performers, Producers of Phonograms and Broadcasting Organizations).

So, the analysis of the market of IP objects shows that in the last two decades there has been a sharp increase in the number of patent applications, trademark applications and other types of IP, along with minor fluctuations in license payments for royalty rates. This conclusion suggests that the global IP market is at an early stage of development and is only being formed. The reason for this phenomenon is not only the globalization of the world economy, but also the active activities of TNCs, which place their research units in different countries around the world. However, it is almost impossible to estimate how much of the intellectual property in world trade has grown in relative terms, as the innovations, which are often associated with them, are accompanied by technological breakthroughs and international exchange of knowledge.
Conclusions

One of the key indicators of the intensification of international intellectual property trade is the scale of demand for IP rights, including international ones. The highest number of applications for patent protection is noted in high-income countries, due to the orientation of most of these countries towards the innovative type of economic development.

There is also an increase in the number of applications from the group of countries with a higher incomes than average and a reduction of the gap with the leading countries by this indicator. At the same time, China is demonstrating the highest rates of increase in the number of applications for both patent protection and trademark registration. According to the author, China has not only become a world center for the protection of intellectual property and national security, but also maintains high growth rates, contributing to consolidation of leading positions in the near future. The analysis of the “initial applications” and “further applications” for obtaining a patent makes it possible to draw a very important conclusion that applicants are increasingly seeking to protect their intellectual property abroad and all in more countries, reflecting the growth of economic integration. Given the pace of change in world expenses on R&D, we can conclude that the, the growth of patenting was mainly due to investment in knowledge in the world as a whole.

The globalization has contributed to the strengthening of IP protection regimes in many countries and the emergence of special interest of economic entities in enterprises that are based on knowledge and information.

The development of technologies (nanotechnology, bioengineering, ICT, etc.) and an increase in the domestic demand of innovative enterprises, the behaviour of which reflects a change in the role of intellectual property in the economy at the national level is equally important. The countries such as the United States, EU and Japan most effectively manage existing intellectual property objects globally, and companies in these countries are competent to use the competitive advantages they create in the international and domestic markets. The growth of R&D expenditures in certain industries, coupled with a reduction in the lifecycle of many products, provided additional incentives for companies to use existing IP rights as competitive advantages. The internationalization is a major factor in the growth of demand for such IP forms as trademarks and patents.

References


INTRODUCTION OF CREATIVE ECONOMY IN INTERNATIONAL RELATIONS:
ASPECTS OF DEVELOPMENT SECURITY

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Abstract. The scientific article outlines the main aspects of deploying a creative economy and shaping its impact on the security of world countries’ development, especially in the context of national innovation policy. The current power balance in the world regarding the development of a creative economy, the dynamic modeling and analysis of various aspects of the creative economy have been determined in the article. A Summary of indicators and factors for assessing the level of achievements of the creative economy and its relation to the security of individual countries has been carried out.

Keywords: development security; creative economy; innovation policy; education level; human capital asset; infrastructure; multiculturalism; Cultural and creative markets


JEL Classifications: A13; F 29

1. Introduction

Economic transformations of the beginning of the 21st century will be manifested in the development of a post-industrial economic mode of production. This process, of course, is quite lengthy and controversial. However, now it is possible to distinguish a number of its characteristic features, such as the integral nature of the economic system, which creates the conditions for joining private initiative and innovation activity, and the multi-layered economy. This determines the socio-economic efficiency of reproduction, the pace of economic growth and requires resource support.

2. Literature Survey

The problem of creativity is becoming very urgent under these fundamentally new socio-economic conditions, - the individual’s ability to create new concepts, the formation of new ideas and ways of their implementation in the economy. The work of such authors is well known in the scientific circles (Benešová, Hušek, 2019; Drobyazko S., 2019; Florida, 2002; Howkins, 2001; Ryan, 2003; Scott, 2003; Tepper, 2002; Tkachenko, 2019). Their scientific achievements and topical issues of creativity as an innovation resource of economic development and form the value of this study.
The purpose of the study is to develop recommendations for the sustainable development of a creative national economy in the light of international trends.

3. Methods

With a view to determine how and which countries in the world are ready to transit to a knowledge-based economy, and therefore have a sufficiently developed creative economy, we will use one out of several available methodologies for determining the level of willingness of countries for transition to a knowledge-based economy (Kisefáková et al., 2018; Korauš et al., 2018; Baltgailis, 2019; Prakash, Garg, 2019). This analysis will make it possible to identify the economics most adapted to the new stage.

4. Results

The first element of the knowledge-based economy to be considered is the education index (Table 1). The Education Index is a composite index of the United Nations Development Program (UNDP). It is one of the key indices of social development. It is used to calculate the Human Development Index in the United Nations Special Report on Human Development (An Interview with John Howkins).

Table 1. Index of education in the countries of the world as of 2017

<table>
<thead>
<tr>
<th>Country</th>
<th>Position in the index of human development</th>
<th>Education Index (0-1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>2</td>
<td>0.939</td>
</tr>
<tr>
<td>Denmark</td>
<td>5</td>
<td>0.923</td>
</tr>
<tr>
<td>New Zealand</td>
<td>13</td>
<td>0.917</td>
</tr>
<tr>
<td>Norway</td>
<td>1</td>
<td>0.916</td>
</tr>
<tr>
<td>Germany</td>
<td>4</td>
<td>0.914</td>
</tr>
<tr>
<td>Ireland</td>
<td>8</td>
<td>0.910</td>
</tr>
<tr>
<td>Iceland</td>
<td>9</td>
<td>0.906</td>
</tr>
<tr>
<td>USA</td>
<td>10</td>
<td>0.900</td>
</tr>
<tr>
<td>The Netherlands</td>
<td>7</td>
<td>0.897</td>
</tr>
<tr>
<td>Great Britain</td>
<td>16</td>
<td>0.896</td>
</tr>
</tbody>
</table>

Source: UNCTAD Creative Economy Outlook and Country Profile report, 2018

The index measures the achievements of the country in terms of the level of education of its population in two main indices:
1. The education index of an adult population (2/3 of weight).
2. Index of aggregate share of disciples in primary, secondary and higher education (1/3 of weight).

The two measured levels of education are reduced to the Final Index, which is standardized in the form of numerical values from 0 (minimum) to 1 (maximum). It is considered that developed countries should have a minimum of 0.8, although many of them have a score of 0.9 or higher. One can see that the human development index is influenced by many factors besides education. Therefore, a high level of education does not yet mean a high level of human development in the country (UNCTAD Creative Economy Outlook and Country Profile report, 2018).

Regarding Australia, education has been steadily increasing from 1990 to 2013. In 2013, index having reached the point - 0.939, stopped developing and continues to remain at this level. Denmark has experienced very rapid growth since 1990 (0.690) by 2013 (0.934), followed by a decline in 2014 to the index -0.923, which is held up to the present. Regarding New Zealand, the index continued to increase indefinitely until 2014, as was the case in Germany, Iceland and Ukraine. Regarding the Netherlands, growth was up to 2013. As for the country that ranked first in the index of human development - Norway, the level of education grew every year, except for 2011, when there was a slight decline, but the following year they made a fairly large leap forward. The UK had the same dynamics - growth, a sharp decline in 2011 and a rebound to 2014. Regarding Ireland, the situation is
similar to Norway, but instead of a big jump, they had a large decline in 2011 (from 0.907 to 0.862). After this, Ireland took baby steps to reach its past level. Regarding the United States, there was a slight decline from 1995 to 2000, but in 2005 they surpassed the level of 1995. After this there was an increase, except for stagnation in 2011-2012 and 2014-2017. The second element to be considered is an innovative system (Table 2).

Table 2. Global Innovation Index 2017

<table>
<thead>
<tr>
<th>Country</th>
<th>Score (0-100)</th>
<th>Ranking 2017</th>
<th>Efficiency factor (0-1)</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switzerland</td>
<td>67.69</td>
<td>1</td>
<td>0.95</td>
<td>2</td>
</tr>
<tr>
<td>Sweden</td>
<td>63.82</td>
<td>2</td>
<td>0.83</td>
<td>12</td>
</tr>
<tr>
<td>The Netherlands</td>
<td>63.36</td>
<td>3</td>
<td>0.93</td>
<td>4</td>
</tr>
<tr>
<td>USA</td>
<td>61.40</td>
<td>4</td>
<td>0.78</td>
<td>21</td>
</tr>
<tr>
<td>Great Britain</td>
<td>60.89</td>
<td>5</td>
<td>0.78</td>
<td>20</td>
</tr>
<tr>
<td>Denmark</td>
<td>58.70</td>
<td>6</td>
<td>0.71</td>
<td>34</td>
</tr>
<tr>
<td>Singapore</td>
<td>58.69</td>
<td>7</td>
<td>0.62</td>
<td>63</td>
</tr>
<tr>
<td>Finland</td>
<td>58.49</td>
<td>8</td>
<td>0.70</td>
<td>37</td>
</tr>
<tr>
<td>Germany</td>
<td>58.39</td>
<td>9</td>
<td>0.84</td>
<td>7</td>
</tr>
<tr>
<td>Ireland</td>
<td>58.13</td>
<td>10</td>
<td>0.85</td>
<td>6</td>
</tr>
</tbody>
</table>

Source: The Global Innovation Index 2017

The Global Innovation Index is a global study and its global ranking in terms of innovation. It is based on the methodology of the International Business School INSEAD, France (Tvaronavičienė, M., 2018).

To understand why countries are becoming leaders in innovation, let’s consider the different countries of the region that have succeeded in this area and consider the strong points that have led them to become regional innovation leaders (Table 3).

Table 3. Regional Leaders in the sphere of innovations

<table>
<thead>
<tr>
<th>Region/rating</th>
<th>Country</th>
<th>Place in the global ranking GII-2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>USA</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Canada</td>
<td>18</td>
</tr>
<tr>
<td>The Sub-Saharan countries of Africa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>South Africa</td>
<td>57</td>
</tr>
<tr>
<td>2</td>
<td>Mauritius</td>
<td>64</td>
</tr>
<tr>
<td>3</td>
<td>Kenya</td>
<td>80</td>
</tr>
<tr>
<td>Latin America and the Caribbean</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Chile</td>
<td>46</td>
</tr>
<tr>
<td>2</td>
<td>Costa Rica</td>
<td>53</td>
</tr>
<tr>
<td>3</td>
<td>Mexico</td>
<td>58</td>
</tr>
<tr>
<td>Central and South Asia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>India</td>
<td>60</td>
</tr>
<tr>
<td>2</td>
<td>Iran, Islamic Republic</td>
<td>75</td>
</tr>
<tr>
<td>3</td>
<td>Kazakhstan</td>
<td>78</td>
</tr>
<tr>
<td>North Africa and West Asia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Israel</td>
<td>17</td>
</tr>
<tr>
<td>2</td>
<td>Cyprus</td>
<td>30</td>
</tr>
<tr>
<td>3</td>
<td>United Arab Emirates</td>
<td>35</td>
</tr>
</tbody>
</table>
Southeast Asia, East Asia and Oceania

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Singapore</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>Republic of Korea</td>
<td>11</td>
</tr>
<tr>
<td>3</td>
<td>Japan</td>
<td>14</td>
</tr>
</tbody>
</table>

Europe

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Switzerland</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Sweden</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>The Netherlands</td>
<td>3</td>
</tr>
</tbody>
</table>

Source: OECD Science, Technology and Industry Scoreboard 2018

The Global Innovation Index is made up of 82 different variables, which detail the innovative development of countries around the world, being at different levels of economic development. The authors of the study believe that the success of the economy is accounted for by both the availability of innovative potential and the conditions for its implementation. Therefore, the Index is calculated as a weighted total of estimates for the two groups of indices (World Intellectual Property Organization. Statistical Country Profiles):

1. Available resources and conditions for innovation (Innovation Input):
   - institutes;
   - human capital asset and research;
   - infrastructure;
   - development of the domestic market;
   - business development.

2. Achieved practical results of innovation (Innovation Output):
   - development of technologies and knowledge-based economy;
   - creative activity results.

Thus, the Final index is a ratio of costs and effect, which allows to objectively assess the efficiency of efforts aimed at developing innovation in one or another country.

With regard for 2017, Switzerland leads the overall ranking for the seventh consecutive year, with twenty-four of the first twenty-five places belonging to high-income countries - China, which ranked twenty-second, is an exception. China has become the first middle-income country since 2016 to rank among the leading twenty-five countries in the innovation ranking.

Indices of a group of middle and low income countries significantly exceed those parameters that could be said based on their level of development: within the current year, the group of “dynamic innovators” includes a total of 17 countries, which is slightly more than in 2016. Nine of them, including Kenya and Rwanda, are located in the sub-Saharan Africa and three in Eastern Europe.

A group of Asian states, including Indonesia, Malaysia, Singapore, Thailand, the Philippines and Vietnam, who are actively improving their innovative ecosystems and pursuing high-quality results for a number of important indices, are approaching such innovative giants as China, Japan and the Republic of Korea. In particular, it concerns the development of education, R&D, the growth rate of labor productivity and the export of high-tech products.

Looking at such an element of the knowledge-based economy as innovation systems - we see that European countries are also in a higher position, which once again emphasizes their desire and willingness to achieve a new economy (Korauš, et al., 2019). Likewise, with respect to this share of the knowledge economy, Asian countries are gaining momentum, among them - China, Japan, Singapore. This gives them a push forward to a knowledge-based economy.
The third element of the knowledge-based economy to be considered is the state of information and communication technologies (ICT). The ICT Development Index (IDI) is a composite index that characterizes the achievements of the countries of the world in terms of information and communication technologies development. It is calculated according to the methodology of the International Telecommunication Union (International Telecommunication Union), a specialized unit of the UN, which defines world standards in the field of ICT.

The index was developed in 2007 on the basis of 11 indices that the International Telecommunication Union (ITU) operates in its ICT development assessments. The index reduces these indices to a single criterion meant to compare the achievements of the world in the development of ICT and can be used as a tool for benchmarking at the global, regional and national levels. These indices relate to access to ICT, the use of ICT, as well as skills, that is, the practical knowledge of these technologies by the population of countries covered by research. The authors of the study emphasize that the level of ICT development today is one of the most important indices of the economic and social well-being of the state (Center for an Urban Future, 2005).

Recent (ITU) data regarding developments in ICT show that progress is still being made on the ability to establish connections and use ICTs. Mobile networks of mobile communications are increasingly spreading, which now occupy a leading position in the provision of basic telecommunication services. Broadband communication services are growing steadily. Still there are significant digital divides between countries and regions, as well as between developed and developing countries, especially LDC. These divides are evident when using the Internet, as well as in the ability to establish connections. There exists a significant digital gender gap.

With regard for 2017, IDI covers 176 countries of the world. Comparison made with the IDI of 2016 shows that progress in access to and use of ICTs remains in almost all countries (Table 4).

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Iceland</td>
<td>1</td>
<td>8.98</td>
<td>2</td>
<td>8.78</td>
</tr>
<tr>
<td>Republic of Korea</td>
<td>2</td>
<td>8.85</td>
<td>1</td>
<td>8.80</td>
</tr>
<tr>
<td>Switzerland</td>
<td>3</td>
<td>8.74</td>
<td>4</td>
<td>8.66</td>
</tr>
<tr>
<td>Denmark</td>
<td>4</td>
<td>8.71</td>
<td>3</td>
<td>8.68</td>
</tr>
<tr>
<td>Great Britain</td>
<td>5</td>
<td>8.65</td>
<td>5</td>
<td>8.53</td>
</tr>
<tr>
<td>Hongkong, China</td>
<td>6</td>
<td>8.61</td>
<td>6</td>
<td>8.47</td>
</tr>
<tr>
<td>The Netherlands</td>
<td>7</td>
<td>8.49</td>
<td>10</td>
<td>8.40</td>
</tr>
<tr>
<td>Norway</td>
<td>8</td>
<td>8.47</td>
<td>7</td>
<td>8.45</td>
</tr>
<tr>
<td>Luxemburg</td>
<td>9</td>
<td>8.47</td>
<td>9</td>
<td>8.40</td>
</tr>
<tr>
<td>Japan</td>
<td>10</td>
<td>8.43</td>
<td>11</td>
<td>8.32</td>
</tr>
</tbody>
</table>

Source: Measuring the Information Society Report 2017

Iceland occupies the first place in IDI’s ranking in 2017 - an IDI value of 8.98. It is followed by six European countries and three countries in the Asia-Pacific region, having competitive ICT markets, which maintain high levels of investment and innovation in the field of ICT for many years. The countries that are at the top of the IDI distribution also have high levels of economic well-being, literacy and other skills that enable citizens to fully enjoy the benefits of access to communications.

The average IDI rose by 0.18 points in all countries from 2016 to 2017, reaching 5.11 points, the first time rising above the middle of the scale. Regarding IDI of 2016, improvements are particularly significant among middle-income countries, many of which are middle-income developing countries, although the position change in the rating was only limited. The most significant improvements in IDI values are observed in Namibia, the Islamic Republic of Iran and Gabon - all of these values have grown by 0.50 points or more (Table 5).
Table 5. The most dynamic countries in IDI rankings and values, 2016-2017

<table>
<thead>
<tr>
<th>IDI position in 2017</th>
<th>Country</th>
<th>Changes in IDI rating</th>
<th>IDI position in 2017</th>
<th>Country</th>
<th>Changes in IDI values</th>
</tr>
</thead>
<tbody>
<tr>
<td>95</td>
<td>Uzbekistan</td>
<td>8</td>
<td>118</td>
<td>Namibia</td>
<td>0.57</td>
</tr>
<tr>
<td>159</td>
<td>Afghanistan</td>
<td>6</td>
<td>81</td>
<td>Iran</td>
<td>0.54</td>
</tr>
<tr>
<td>36</td>
<td>Croatia</td>
<td>6</td>
<td>114</td>
<td>Gabun</td>
<td>0.50</td>
</tr>
<tr>
<td>88</td>
<td>Suriname</td>
<td>6</td>
<td>139</td>
<td>Laos</td>
<td>0.47</td>
</tr>
<tr>
<td>152</td>
<td>Uganda</td>
<td>6</td>
<td>28</td>
<td>Cyprus</td>
<td>0.47</td>
</tr>
<tr>
<td>42</td>
<td>Uruguay</td>
<td>6</td>
<td>111</td>
<td>Indonesia</td>
<td>0.47</td>
</tr>
<tr>
<td>139</td>
<td>Laos</td>
<td>5</td>
<td>112</td>
<td>Bolivia</td>
<td>0.47</td>
</tr>
<tr>
<td>35</td>
<td>Latvia</td>
<td>5</td>
<td>122</td>
<td>Timor-Leste</td>
<td>0.46</td>
</tr>
<tr>
<td>135</td>
<td>Myanmar</td>
<td>5</td>
<td>67</td>
<td>Turkey</td>
<td>0.43</td>
</tr>
<tr>
<td>118</td>
<td>Namibia</td>
<td>5</td>
<td>80</td>
<td>China</td>
<td>0.42</td>
</tr>
<tr>
<td>122</td>
<td>Timor-Leste</td>
<td>5</td>
<td>135</td>
<td>Myanmar</td>
<td>0.42</td>
</tr>
<tr>
<td>67</td>
<td>Turkey</td>
<td>5</td>
<td>95</td>
<td>Uzbekistan</td>
<td>0.42</td>
</tr>
</tbody>
</table>

Source: Measuring the Information Society Report 2017

All countries, except for eight, have improved their overall IDI values. Despite the significant increase in the share of Internet users in the country, improvements in the sub-index of ICT use were made due to a significant increase in subscriptions to mobile broadband communication networks, which increased from 35.82 to 66.15 per 100 inhabitants during the year. Namibia also improved its value in the sub-index of access by 0.16 points, from 4.23 to 4.39, and in the sub-index of ICT skills by 0.11 points, from 3.85 to 3.96.

In general, as in previous years, the sub-index of use of ICT grew faster by 0.31 points than sub-access points and skills, both of which rose by an average of 0.10 points. The index of contracts for mobile broadband made the most significant contribution to improving the values of IDI, which increased by 12.9 points over the year.

Conversely, the fixed-line contract rate continued to decline gradually in most countries.

The problem of reducing the digital divide between countries, connected to a greater or lesser extent, still remains. Regarding IDI in 2017, the gap between the countries with the highest and lowest indices points rose to 8.02 points (from 10.0). As in previous years, there exists a strong relationship between economic development and the development of ICTs, with the least developed countries (LDCs) occupying 37 out of 44 places in the lower (connected to the smallest extent) quarter of distribution. The average IDI in the LDC increased by 0.15 points in the year and by 0.22 points in other developing countries, suggesting that the LDC backlog in ICT development may increase further.

As IDI shows, there are significant differences between the geographical regions in the levels of ICT development (Fig. 1). There are also significant fluctuations in the experience of individual countries within each region. IDI differences between regions and individual countries are mainly related to levels of economic development.

Europe remains the leading region in the development of ICTs. There is the highest average IDI among the regions of the world (7.50 points). This reflects the high levels of regional economic development, the availability of competitive communication markets and high levels of ICT skills. Regarding all countries in the region of Europe, the IDI value is higher than the average world. Only 28 out of 40 countries are in the highest quarter, and only one - Albania, is not part of the upper half of the division. The most noticeable increase in values is observed in Cyprus and Turkey.

With regard for the region of North and South America, the IDI rating is headed by the United States and Canada. Most countries in the region are two medium-sized quartile groups, and only two least-connected counties
(LCCs) - Cuba and Haiti - are located in the lower quartile group. The most significant improvements in this region are observed in countries with averages in South and Central America and the Caribbean.

**Fig. 1.** Average IDI and sub-indices, world and regions, 2017

*Source: Developed by the authors according to the source (Measuring the Information Society Report 2017)*

On the contrary, the Asia-Pacific region is most heterogeneous as regards the development of ICT. Seven countries in the region, that have IDI higher than 7.50 points, belong to the upper quartile of the global IDI of 2017, including the Republic of Korea, which ranks second.

The region of the Arab states is also extremely diverse in terms of IDI. This region has a number of high-income oil producing countries, three of which belong to the upper IDI quartile, as well as a number of low-income countries, four of which are LCC. The most notable improvements in this region are observed in middle-income countries, whose average figures have grown by magnitudes, twice higher than those in the upper and lower regions of the regional distribution.

Africa remains a region with the lowest IDI indices. Regarding 2017, the average IDI value for this region is 2.64 points, which is more than half of the average world value - 5.11. Only one country of the region - Mavrikiy - is located near the upper half of the global IDI division, which is 28 countries among 38, included in the bottom quartile (LCC) in 2017. This is a generally low area of economic development in the region.

The last element is the institutional regime for knowledge-based economics. It is estimated as standardized number of online government sites. Index of Electronic E-Government development (The UN Global E-Government Development Index) of United Nations organization (UNO) - is a comprehensive index, which assesses willingness and capabilities of the national state structures as regards using information and communication technologies (ICT) aimed at rendering public services to citizens (Hall, 1998). It is issued every two years.

The research contains data on the level of e-government development in different countries, as well as a systematic assessment of trends in the use of ICT by government agencies. All countries covered by this research are ranked in a rating based on a weighted index of estimates for three main components:

1) the degree of coverage and quality of Internet services;
2) the level of development of the ICT infrastructure;
3) human capital asset.
The number of countries that use e-government to provide public services online through the use of universal platforms has sharply increased. With regard for 2003, only 45 countries had a universal platform, and only 33 countries provided an opportunity for online transactions. According to 2016 poll, 90 countries offer one or more individual portals either for government information, or for online services, or both, and 148 countries provide at least one platform for online transaction services (Makedon, V.; Drobyazko, S.; Shevtsova, H.; Malslosh, O.; Kasatkina, M., 2019).

More and more countries are trying to ensure the public institutions to be more open, efficient, accountable and transparent with the help of e-government. Many governments around the world open up their data to inform the public and to be under control. The index as per 2016 shows that 128 countries provide data on public expenditures in electronic formats (United Nations e-government survey, 2017).

Owing to easy access to social networks, more and more countries are moving towards joint decision-making. Although developed countries, especially European ones, are among the top 50 in this sphere, many developing countries, especially low and middle income countries, also succeed (Table 6). Extending e-participation can support the Goals of Sustainable Development (GSD) by expanding the number of participants in decision-making.

Table 6. Index of e-government development (EGDI), 2016

<table>
<thead>
<tr>
<th>Position</th>
<th>Country</th>
<th>Online Services Index (OSI)</th>
<th>Human Capital Index (HCI)</th>
<th>Telecommunications Infrastructure Index (TII)</th>
<th>EGDI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Great Britain</td>
<td>1.0000</td>
<td>0.9402</td>
<td>0.8177</td>
<td>0.9193</td>
</tr>
<tr>
<td>2</td>
<td>Australia</td>
<td>0.9783</td>
<td>1.0000</td>
<td>0.7646</td>
<td>0.9143</td>
</tr>
<tr>
<td>3</td>
<td>Korea</td>
<td>0.9420</td>
<td>0.8795</td>
<td>0.8530</td>
<td>0.8915</td>
</tr>
<tr>
<td>4</td>
<td>Singapore</td>
<td>0.9710</td>
<td>0.8360</td>
<td>0.8414</td>
<td>0.8828</td>
</tr>
<tr>
<td>5</td>
<td>Finland</td>
<td>0.9420</td>
<td>0.9440</td>
<td>0.7590</td>
<td>0.8817</td>
</tr>
<tr>
<td>6</td>
<td>Sweden</td>
<td>0.8768</td>
<td>0.9210</td>
<td>0.8134</td>
<td>0.8704</td>
</tr>
<tr>
<td>7</td>
<td>The Netherlands</td>
<td>0.9275</td>
<td>0.9183</td>
<td>0.7517</td>
<td>0.8659</td>
</tr>
<tr>
<td>8</td>
<td>New Zealand</td>
<td>0.9420</td>
<td>0.9402</td>
<td>0.7136</td>
<td>0.8653</td>
</tr>
<tr>
<td>9</td>
<td>Denmark</td>
<td>0.7754</td>
<td>0.9530</td>
<td>0.8247</td>
<td>0.8510</td>
</tr>
<tr>
<td>10</td>
<td>France</td>
<td>0.9420</td>
<td>0.8445</td>
<td>0.7502</td>
<td>0.8456</td>
</tr>
<tr>
<td>62</td>
<td>Ukraine</td>
<td>0.5870</td>
<td>0.8390</td>
<td>0.3968</td>
<td>0.6076</td>
</tr>
</tbody>
</table>

Source: Developed by the authors according to the source (United nations e-government survey, 2017)

Countries continue to advance to higher levels of e-government. With regard for 2016, the number of countries with very high and high rates of e-government development (EGDI) has increased.

Still, there are gaps between regions; 66% of the 29 countries with very high levels of EGDI are European, while African countries account for 81.2% of the low level of EGDI. Africa (average EGDI 0.2882) and Oceania (average EGDI 0.4154) are below the global mean of EGDI. Asia index equals 0.5132, American one equals 0.5245, and European one is 0.7241 (Table 7).

Table 7. Average values of EGDI and sub-indices in regions, 2016

<table>
<thead>
<tr>
<th>Region</th>
<th>Africa</th>
<th>America</th>
<th>Asia</th>
<th>Europe</th>
<th>Pacific Islands</th>
<th>World</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGDI</td>
<td>0.2882</td>
<td>0.5245</td>
<td>0.5132</td>
<td>0.7241</td>
<td>0.4154</td>
<td>0.4922</td>
</tr>
<tr>
<td>OSI</td>
<td>0.2567</td>
<td>0.4959</td>
<td>0.512</td>
<td>0.6926</td>
<td>0.2966</td>
<td>0.4623</td>
</tr>
<tr>
<td>TII</td>
<td>0.1724</td>
<td>0.3844</td>
<td>0.373</td>
<td>0.6438</td>
<td>0.2599</td>
<td>0.3711</td>
</tr>
<tr>
<td>HCI</td>
<td>0.4355</td>
<td>0.6933</td>
<td>0.6545</td>
<td>0.836</td>
<td>0.6897</td>
<td>0.6433</td>
</tr>
</tbody>
</table>

Source: Knowledge Assessment Methodology, 2018
With regard for LDC, the development deficit as regards the e-government reflects the scale of the problems faced by these countries, including in the sphere of sustainable development. It is very important to develop the ICT infrastructure, improve access to knowledge and technology, and build appropriate capacities to achieve the many important goals of sustainable development in these countries. At the same time, some LDC have made progress in e-government.

Small Island Developing States (SIDS) should benefit greatly from e-government, but their EGDI remains slightly below the global mean value. Both LDCs and SIDS partnerships, as well as international and regional cooperation, will be crucial to achieving progress in e-government and ICT in general. It can also be noted that the high level of e-governance is positively influenced by progress in some areas of the CSD (Centre of Strategic Developments), in particular, in the areas of competition and fighting against corruption (Dalevska, N., Khobta, V., Kwilinski, A., & Kravchenko, S., 2019).

After analyzing all elements of the knowledge-based economy, we can distinguish three countries that are included in the top ten in all the considered indices - Denmark, the Netherlands and the United Kingdom. Let’s calculate the index of knowledge-based economy for these countries (Table 8). But then, in more detail, we will consider and compare the “country leaders” with the knowledge-based economy and consider the state of the creative economy in these countries.

Table 8. Calculation of the knowledge-based economy index

<table>
<thead>
<tr>
<th>Country</th>
<th>Education Level Index</th>
<th>Global Innovation Index</th>
<th>ICT Development Index</th>
<th>E-government Development Index</th>
<th>Knowledge-based economy Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>0.923</td>
<td>58.70</td>
<td>8.71</td>
<td>0.8510</td>
<td>0.808</td>
</tr>
<tr>
<td>The Netherlands</td>
<td>0.897</td>
<td>63.36</td>
<td>8.49</td>
<td>0.8659</td>
<td>0.811</td>
</tr>
<tr>
<td>Great Britain</td>
<td>0.896</td>
<td>60.89</td>
<td>8.65</td>
<td>0.9193</td>
<td>0.822</td>
</tr>
</tbody>
</table>

Source: UNDP. Human Development Report, 2018

Consequently, following this assessment methodology, Denmark, the Netherlands and the United Kingdoms’ willingness to transit to the knowledge-based economy sounds the highest among all countries of the world.

The next three indices - human capital asset and research, infrastructure, market degree of development - are held more or less at one level, which is not to say about the latter. Indices of business organization, knowledge and technological outcomes in Denmark and the UK are much lower as compared to the Netherlands. This allowed the Netherlands to step forward in the ranking of innovations (Delery, Roumpi, 2017).

Denmark has the highest growth among the top ten, it is steadily progressing from the tenth place in 2017 and the 8th in 2016. The country is improving its position in almost all elements, except for the market degree of development, where it holds the sixth place, as well as knowledge and technological results (16th place), where it lost two positions. At the level of sub-elements, Denmark has grown most in education (4th place), ICT (14th), environmental sustainability (11th place), innovation (17th), knowledge dissemination (17th) and intangible assets (25th).

Denmark ranks first among many indices, including education, researchers, ICT use and scientific and technical articles. It also refines its position in many areas, such as government expenditure per student, GDP per unit of energy consumption, cooperation in the field of university and industrial research, export of ICT services, etc. (Makedon, et al., 2019).

There exist opportunities for further improvement, in particular in the field of higher education (19), general infrastructure (44), trade, competition and scale of the market (37), influence of knowledge (34). Relatively weak indicators include - graduates in the field of science and technology, the formation of gross capital and
GDP growth per employee.

The United Kingdom (UK) moved from 3rd to 5th place in 2017. It refines its position in a number of key areas, namely, institutes (9), human capital asset and research (6), and business organization (13). Regarding the “lower” levels in the UK, one can distinguish the political environment (18th place), education (22nd place) and knowledge acquisition (28th place). The country loses its position in two elements: knowledge and technological results (13), which fell by four places with the largest drop in the sub-element of knowledge dissemination (38), and creative activity (fourth place).

At the level of sub-elements, some education costs, student spending on state-of-the-art, IP payments, import and export of ICT services, GDP per employee growth rate and national feature films are one of the greatest improvements. On the contrary, positions such as the results of the International Student Assessment Program, the use of ICT and patent families lose most of the positions. The United Kingdom retains its first place in quoted documents and receives 1st place in government online services and e-participation.

The Netherlands took the third position in 2017, taking second place in the sub-index of innovation production and the fourth - in the rate of innovation efficiency. Indeed, the Netherlands lost five positions as a result of large volatility of selected data in 2016, which are now better taken into account. As a result, the Netherlands ranked sixth in net inflow of Foreign Direct Investment (FDI), and the first - in the outflow of FDI in 2017.

The Netherlands has improved its ratings in a number of other areas, including education (18th place), innovation links (7th place) and knowledge impact (17th place), partly due to R & D revenues funded abroad and education costs. The weak spheres of the country include: higher education (49th place), general infrastructure (30th), environmental sustainability (39th place), credit (35th) and investment (26th place) (European Parliament resolution of the promotion of European cultural and creative sectors as sources of economic growth and job).

So, as we see, the Netherlands has really achieved much more success and deserved to rank third, ahead of Denmark and Great Britain.

With regard to the development of ICTs, as was already mentioned, Europe is the region with the highest average IDI in 2017. As in previous years, most of the highest ranking positions in the regional rating are occupied by the countries of Northern and Western Europe, including Denmark, the United Kingdom and the Netherlands, which ranked 3, 4 and 5 respectively in the regional rating.

There is no big difference between these countries in sub-indexes. They gain the highest value almost in all parameters, except stationary communication and the Internet. Still, this situation is observed in almost all countries. This is due to the transition of people to cellular communications and mobile Internet. Although the UK has the largest share of the population of these three countries, which uses stationary communication (Figure 2).
As for the Netherlands, this country was listed in the most dynamic countries by the IDI rating in the European region. Its rating has grown to three positions, from 10th in 2016 to 7th in 2017.

Regarding the e-government index, e-governments are constantly evolving around the continent of Europe, it can be called the leading region. The countries that we consider are among the top 10 leading ones of this index - Great Britain (1st place), the Netherlands (7th place), Denmark (9th place) (Figure 3).

Denmark and the United Kingdom are striving for a “digital dictatorship”, or so called “digital by default”, while the essence of the matter is that the maintenance and development of any physical system is carried out only when a digital alternative is missing. That is, the physical system becomes an alternative, and digital - becomes the usual state of the system’s operation. The use of digital identity is fast becoming a norm and an integral part of any functional e-government website in these countries.

Figure 3 shows that the UK e-government index is the highest. Due to this, it ranks first in the rating. Regarding the index of Human Capital Index (HCI), the leaders achieved almost identical results. This index consists of four components, namely: adult literacy rate, aggregate total enrollment ratio for primary, secondary and higher education, expected and average years of study.
The Netherlands has fallen behind Denmark and the United Kingdom as regards the Telecommunications Infrastructure Index (TII), which is an arithmetic average of five indices: planned Internet users, number of fixed telephone lines, number of mobile subscribers, the number of wireless broadband subscriptions and the number of fixed subscribers per 100 residents.

The European Union has the second largest market in the creative economy, which is second only to the market of the Asia-Pacific region. Income from creative industries in European countries exceeds 700 billion dollars, that is, 32% of the world’s creative sector income. Therefore, lately, there has been a strong interest taken by key EU and national governments in developing cultural and creative industries. Culture and the creative sector are recognized as sources of economic growth, dialogue in society and one of the key elements of the crisis in the EU (Global Economic Prospects, 2019).
The EU renders significant state support to the creative economy, which manifests itself through the implementation of financial and tax privileges, purchasing activities, subsidies and promoting employment in the sector. So, creative companies occupied about 4.5% of the EU economy in 2017.

Over recent years, the contribution of creative and cultural industries to economic development has been characterized by a decline in all major industries, with the exception of broadcasting, the film industry, and information industries, mainly due to web development, software and programming (Table 9) (Beyers, et al. 2004). A special place was occupied by advertising activities in 2016, which during this period generated more than 143 billion dollars.

The Platform for Regional and National Developers for the Creative Industries Development Strategy and Business Support in this sector is the European Creative Industries Alliance (ECIA), founded in 2011. The Alliance’s actions are aimed at supporting the operation of innovative vouchers, increasing financial support and developing clusters of advanced experience and cooperation in the creative and cultural industries (Vogel, 2001).

5. Discussion

The special value of the creative and cultural industries is that they are a powerful tool for improving the employment rate among young people. The proportion of people aged 15-29 was 19.1% of the total volume of creative activity in 2014. The Countries such as the United Kingdom and France are leaders in the number of young people in the creative sector. As a comparison, in Central and Eastern European countries, the tendency of proportional domination of the level of employment of young people in the creative and cultural industries is observed in comparison with other branches of economy.

Despite the innovation of creative industries, national economies, in particular the EU countries, play an active role in their development. Indices of the effectiveness of the functioning of creative industries in Europe clearly reflect their socio-economic impact: the economic efficiency of these industries brings income of $ 709 billion dollars. and provides 7.7 million people with jobs.

Today the European Union countries are working to overcome the communication barrier between the authorities and the public; the formation of a system of interaction between creative industries and other sectors of the economy, as well as on improving labor and tax policies for implementing business in the creative industries (Americans for the Arts, 2004). EU countries generate creative hubs that provide communication between cultural organizations and creative industries and conduct ongoing research in the field of culture (Ključnikov, et. al. 2019).

Europe is dominated by the 2017 list, with 11 of the 15 most competitive, creative economies on the continent. Switzerland, Denmark and Belgium remain the most competitive countries in the IMD World Talent 2017 ranking. Austria, Finland, the Netherlands, Norway, Germany, Sweden and Luxembourg make up the top ten (Table 10). IMD ratings as per 2017 confirm long-term trends in terms of talent competitiveness.

Denmark ranked second in the IMD World Talent rating. It is the first regarding the investment and development factor, in which it ranks fifth in the total public expenditure on education and public expenditure on education per student. The country is thriving in the process of implementing the educational process (4th place) and determining the priorities of training personnel (2nd place). However, like in Switzerland, the quality of education in Denmark is relatively low for primary (13) and secondary (25) school.
Table 10. Rating IMD World Talent, 2017

<table>
<thead>
<tr>
<th>Rating IMD</th>
<th>Country</th>
<th>Investments and development</th>
<th>Attractiveness</th>
<th>Willingness</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Switzerland</td>
<td>5</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Denmark</td>
<td>1</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Belgium</td>
<td>2</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>Austria</td>
<td>3</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>5</td>
<td>Finland</td>
<td>4</td>
<td>24</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>Netherlands</td>
<td>15</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>Norway</td>
<td>6</td>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>8</td>
<td>Germany</td>
<td>10</td>
<td>8</td>
<td>15</td>
</tr>
<tr>
<td>9</td>
<td>Sweden</td>
<td>9</td>
<td>12</td>
<td>19</td>
</tr>
<tr>
<td>10</td>
<td>Luxemburg</td>
<td>16</td>
<td>4</td>
<td>17</td>
</tr>
<tr>
<td>21</td>
<td>Great Britain</td>
<td>37</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>59</td>
<td>Ukraine</td>
<td>35</td>
<td>62</td>
<td>60</td>
</tr>
</tbody>
</table>

Source: Knowledge Assessment Methodology, 2018

The country is 10th regarding the factor of attractiveness. In this respect, Denmark has high levels of employee motivation (2nd place), personal security and private property rights (2nd place), remuneration (3rd), and determining prioritization of attraction and retention of talent (3rd place). Although, such a result of attracting and retaining talent is used mainly for local employees, as Denmark ranks 25th in terms of attractiveness for foreign highly skilled personnel. The country also has an extremely low index of the rate of personal income tax (63rd place).

Conclusions

The methodology has been applied to determine the level of willingness of countries for the transition to a knowledge-based economy with a view to realize to what extent and which countries in the world are ready to transit to a knowledge-based economy, and thus have a well-developed, creative economy. The development of the main elements of knowledge-based economy in different countries of the world has been analyzed. Top ten countries have been allocated for each element of the knowledge-based economy.

According to the education index as an element of the knowledge-based economy, it has been discovered that, the most part of European and US countries have formed and continue developing a level of education that gives them the opportunity to transit to a knowledge-based economy, and hence to the development of a creative economy. According to the analysis of the index of innovations, which represents the ratio of costs and the effect, which allows to objectively evaluate the effectiveness of efforts made to develop innovation, have determined that European countries occupied higher positions, which again emphasized their desire and willingness to achieve a new economy. It has been discovered that Asian economies, such as China, Japan, Singapore, are gaining momentum in this part of the knowledge-based economy. This gives them a boost to a knowledgeable economy. Regional Leaders in Innovation have also been identified.

Considering the institutional regime for the knowledge-based economy has made it clear that there is a tendency to improve and develop this element in many countries. It has been found that the number of countries that use e-government to provide public services online through universal platforms has steeply risen; more and more countries are trying to ensure that public institutions to be more open, efficient, accountable and transparent with the help of e-government; many governments around the world open up their data to inform the public and to be under control; Thanks to easy access to social networks, an increasing number of countries are moving towards joint decision-making.

The state of the creative economy in the European countries was considered and the selected countries were evaluated regarding the development of their creative economy. Denmark performed the best, the worst results belonged to Great Britain.
References


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ESTIMATING AND MANAGING OF GOVERNMENT EXPENDITURE IN THE SELECTED EUROPEAN UNION COUNTRIES

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Abstract. This paper has aimed to consider how government expenditure contributes to economic growth by focusing on both the level and composition of government spending, in connection to the dynamics of GDP per capita growth. The investigation covers the period from 1997 to 2017. The authors have applied total expenditure approach analyzing interrelationships between government expenditure and economic growth and division approach examining and comparing the distributions of government expenditure in the selected European Union countries. The authors have applied descriptive statistics, the Pearson’s correlation, intensity rate of structural changes and Finger-Kreinin indicator. The findings have suggested the following: 1) there is no evidence on the relationship between general government expenditure and economic development in the European Union countries; 2) the countries with a greater proportion of productive spending, such as Cyprus, Greece, Lithuania, Hungary, Estonia, Slovakia have a low GDP per capita indicator. Economically strong countries, such as Denmark, France and Sweden have relatively low level of productive expenditure; 3) economically stronger countries have more stable compositions of government expenditure than economically weaker ones; 4) the countries with a similar real GDP per capita have been characterized by more similar government spending structures. As the economic gap between countries grows, divergence in allocation of government spending increases. The findings of this research could provide important guideline for the managing of government expenditure in the European Union countries. Moreover, it can serve as a guideline to a public budget management in the countries under consideration.

Keywords: correlation analysis; government expenditure; economic growth; intensity of structural changes; Finger-Kreinin indicator

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JEL classifications: H50, H75, H76, O10, O40

1. Introduction

Scientific studies have shown that government can affect economic growth by its size and quality. The relationships among the government size and quality and economic performance have been still a subject of intensive debate among scholars and policy-makers and has reached inconclusive outcomes. The debate has focused on whether government size stimulates economic growth, whether good management is beneficial for economic performance, and how government size and management interact (Kim et al., 2018). According to Nirola and Sahu (2018), most economists agree that large governments are detrimental for economic growth. In the scientific context there are two broad approaches on government size – economic growth nexus, i.e. the Keynesian and Wagnerian approaches. The Keynesian law has stated that increased government size leads to higher aggregate demand and economic growth. The Wagnerian theory has pointed that an increase in national income requires more government expenditure (Tang 2009; Bataineh 2012; Sedrakyan, Varela-Candamio 2019). A number of recent studies have shown that many scientists (Gomez 2008; Irmen, Kuehnel, 2009; Pappa 2009;
Abu, Abdulahi 2010; Barro, Charles 2011; Taiwo, Abayomi 2011; Ramey 2011; Anwar et al. 2012; Patricia, Izuhukwu 2013; Hajamini, Falahi 2018; Kim et al. 2018) from different countries have analyzed these issues. According to Kim et al. (2018) the investigations on government size and economic growth have revealed the importance of the state’s absorption of society’s resources through its spending and related taxation.

The findings of the studies have varied across the countries under consideration. The first group of the scientists has found that a larger state sector is growth-impeding (Bergh, Karlsson 2010). The second group has revealed the beneficial effect of government promoting economic development (Kneller et al., 1999). The third group of the studies have shown that increased government expenditure may slow down the total economic growth because the government may have to raise taxes or borrow money to finance rising spending (Ahmad, Loganathan, 2015).

Theory also emphasizes an optimal level of government expenditure. If government expenditure is too low, the supply of public goods is less than it needs to be to maximise economic growth. However, beyond a certain level of expenditure, the size of government sector starts negatively impact on economic growth. Moreover, if an economy experiences sub-optimal growth, this could illustrate either government size is too high or too low (Makin et al. 2019). Government expenditure management associates with allocation and use the resources responsively, efficiently and effectively. In the public expenditure management, it is advised to keep in mind the integral relationship between revenue and expenditure, particularly the allocation of the money collected in a manner that reflects most closely the public preferences (Asian development bank, 1999). Devarajan et al. (1996) presented a model that expresses the difference between productive and non-productive government expenditures. The authors introduced how a country’s desire to reach a more optimal growth rate can be achieved by increasing the proportion of productive expenditure in total government spending (Chu et al. 2018). Given the inconsistencies in empirical findings, it is surprising that relatively little attention has been paid to comparing and contrasting the government expenditure composition in EU countries at different level of economic development. We hope, that this investigation will partially fill this gap.

**Problem of the research:** does government size stimulates economic growth? What are the peculiarities of the government expenditure management in the selected EU countries?

**Object of the research:** the estimation and managing government expenditure in the European Union countries.  
**Aim of the research:** on the one hand, this research attempts to provide more reliable estimates of the interrelationship between general government spending and economic growth. On the other hand, it estimates government expenditure distribution in the EU countries.

**Limitations of the research:** this investigation has been bounded by the relationship between general government expenditure and economic growth, also the breakdowns of government expenditure on the basis of the activities they support. In this paper, the authors have not estimated the causal nexus between government expenditure and economic growth and the effect of the government expenditure’s allocation by activities on economic performance. It is the main limitations of the research. Despite the limitations, we believe that the research reveals the key findings in the EU countries.

In the introduction, the authors have presented theoretical background, scientific problem and the aim of the investigation. Section 2 reviews previous studies on the estimation and management of the government expenditure and research methodology. The studies of different countries are summarized and the main insights are provided. Section 3 estimates relationships between indicators and assesses distributions of the government expenditure. Finally, the last section summarizes the main insights.
2. Empirical evidence and research methodology

2.1. The overview of recent studies

The effect of government size on economic growth has been a controversial issue. On the one hand, government can provide public health and education, infrastructure and security and other activities for the whole community. On the other hand, government cannot allocate very large sums to expenditure given the need to finance spending by taxes and borrowing. Government can play both a positive and negative role in economic development (Hajamini, Falahi 2018). Governments tend to absorb a sizeable share of the national output and thereby affect the economic growth (Nirola and Sahu 2018). According to Makin et al. (2019), before the First World War, government expenditure in industrial economies made approximately ten per cent of national income.

In the twentieth century, the relative size of the government sector started to grow significantly, especially in the 1960’s and 1970s due to significant increase in spending on health, education and age pensions. During the global financial crisis in 2008-2009, the share of government expenditure rose when governments implemented the Keynesian fiscal policy in order to stabilise aggregate demand. For the advanced economies this share has since fallen on average five percent of GDP (Makin et al. 2019). In addition, the studies (North 1990; Fraj et al. 2018) carried out have supported the importance of public management in sustaining economic growth. Management corresponds to the effectiveness to develop institutions able to organize markets, involving effective regulation that promotes competition, the creation and protection of property rights, fight against corruption, and sound macroeconomic policy (Fraj et al. 2018). Public expenditure management is country-specific. It should be grounded on the economic, social, administrative, and implementation capacity of the specific country. The allocation of funds results from a series of forces that, theoretically, have developed a certain intuition about what public needs (Asian Development Bank 1999). Hereafter, the findings from the most recent relevant investigations have been revealed.

Taiwo and Abayomi (2011) studied the effects of government expenditure on the economic growth in Nigeria over 1970-2008. The results have indicated a positive relationship between real GDP growth and capital expenditure. The researchers have noticed that government should promote efficiency in the allocation of resources. Wang and Wen (2013) analyzed the macroeconomic effect of government spending in China. The results have shown that government expenditure Granger-causes output and investment, and inflation as well.

Morozumi and Veiga (2016) examined the role of institutions in the relationship between public spending and economic growth. Empirical results based on a dataset of 80 countries over the period of 1970–2010 have suggested that when institutions promote government to be accountable to the public, public capital spending stimulates economic growth. The study has shown that growth-promoting effect prevails for various financing sources including an increase in budget deficit and revenue, also a reallocation from current spending. Asimakopoulos and Karavias (2016) studied the nature of the relationship between government size and economic growth and identified the optimal level of government size. They have revealed that this relationship is statistically significant above and below the optimal level, even after splitting the sample to developed and developing countries. Finally, the authors have found an asymmetric impact of government size on economic growth in both developed and developing countries. Mladenovic et al. (2016) analysed the influence of health care expenditures on the GDP growth rate. The results have shown that the total health care expenditure has the highest influence on the economic growth rate forecasting. The researchers have concluded, that the improvements in health status would be worth the effort even if they turn out to have little impacts on growth.

Wu et al. (2017) explored the impacts of government expenditures and corruption on total factor productivity using provincial panel data from 2007 to 2014 in China. The results have suggested that “U” shape curve relationships exist between government expenditures of administrative service, safeguard governance, investment development and total factor productivity. Moreover, the findings have illustrated that increased corruption levels can directly reduce regional total factor productivity. Also, increasing the shares of government expenditures could improve the total factor productivity up until the threshold value.
Nirola and Sahu (2018) investigated the impact of government size on economic growth across 23 states in India from 2005 to 2014 for varying degrees of institutions’ quality. The authors have found that state governments should emphasize on quality of institutions to enhance state-level economic growth. In the context of increase in government size, the states that have better quality of institutions show a lower negative impact on economic growth compared to less progressive states. Dudzevičiūtė et al. (2018) studied causal nexus between government expenditure and economic development in the European Union countries over 1995-2015. The research has confirmed the causality running from government expenditure to economic growth in Sweden and Slovakia. In this case, the government should focus on expenditure as a factor of economic growth. Moreover, unidirectional causality from economic growth to government expenditure has been detected in France, Belgium, Germany, Portugal and Cyprus. This has indicated that the government should ensure that resources are properly managed and efficiently allocated to stimulate economic development. In addition, the results have revealed the absence of causality between the variables in Poland. The study of Hajamini and Falahi (2018) examined the non-linear relationship between government size and economic growth among 14 developed European countries during 1995–2014. The results have indicated an asymmetric effect of final consumption expenditure and government gross fixed capital formation on economic growth when they are above and below the optimal level. The optimum values have been estimated to be 16.63 and 2.31%, respectively. Moreover, it has been revealed that current expenditure other than final consumption always has a negative effect on economic growth. The researchers have concluded that in terms of policy implementation, governments of developed countries should be aware that misallocation of public expenditure can become unproductive after passing an optimal size. Kim et al. (2018) explored whether there exist nonlinear threshold effects of government size and governance on growth and whether the effect is mainly mediated through the productivity growth channel in developed and developing countries. The scientists have found that better governance helps government increase productivity and growth, and bigger government size helps governance raise productivity. In addition, government size turns harmful to growth above some threshold level and governance becomes beneficial to growth above some threshold level of governance. Facchini and Seghezza (2018) focused on the effects of the composition of public spending on growth in France for the period 1870–2010. The authors have revealed that the expenditure which is aimed at the protection of property rights contributes to output growth. Also, in the area of social expenditure, only health spending contributes to economic growth. Moreover, public interventions in support of the economy have no impact on growth. Finally, the research has confirmed that the restriction of the size of the government and the delimitation to its essential functions tends to favour output growth (Facchini, Seghezza 2018). Chu et al. (2018) examined the relationship between the compositions of government expenditure and economic growth. They used panel data from 37 high-income and 22 low to middle-income countries covering 1993–2012. The study has shown that a shift in government expenditure away from non-productive towards productive forms of spending are associated with higher levels of growth in both high-income and low to middle-income countries. Moreover, the authors have found that an increase in level of government expenditure has a crowding-out effect and thus negatively impacts on long-run economic growth.

Sedrakyan and Varela-Candamio (2019) analyzed the causal relationship between government expenditure and economic growth in Armenia and Spain for the period of 1996 – 2014. The findings have provided a strong evidence of Wagner’s law in both countries. In the period of economic growth, it has been a strong public policy management tool. In addition, the Keynesian law has played an important role in both countries during the periods of economic decline or high public debt. Makin et al. (2019) paid attention to the influence of the relative size of government on economic growth in Australia. The findings have suggested that the share of government expenditure in Australia consistent with maximising economic growth amounted to 31 per cent of national income, i.e. significantly below the current level.

To sum up, the studies have revealed that in many cases the relationship between government expenditure and economic growth has been detected, but the practices of different countries lead to different findings. The studies have illustrated when government expenditure is too low, the supply of public goods is less than it needs to be to maximise economic growth. However, beyond a certain level of expenditure, the size of government sector starts negatively impact on economic growth rates. Moreover, public expenditure management is also country-specific, depending on the country’s economic, social, administrative, and implementation opportunities.
2.2. Research data and methodology

Data. The research has been based on Eurostat information. Eurostat has collected annual data on government expenditure by function. Data are available at two levels. The first level splits expenditure into ten classes according to functions, and the second level further splits the first level classes into further groups (OECD 2014). The investigation covers the period from 1997 to 2017. For the estimations, some variables have been used that is real GDP per capita growth (percentage), government expenditure as a share of GDP (percentage), government expenditure by functions (percentage of total expenditure).

Methodology. The authors have referred to methodology considered in studies of different authors (Memedovic, Iapadre 2010; Cortuk, Singh 2010; Zhu, Wang 2011; OECD 2014; Pavelescu 2014; Mahmood, Linden 2017). The indicators for estimation of government expenditure patterns (intensity of structural changes and Finger-Kreinin) have been employed. The investigation consists of some stages as follows:

Stage 1. There have been used descriptive statistics analysis, which has allowed assessing the dynamics of general government expenditure and economic performance. The EU countries have been grouped into four categories, such as high spenders, upper middle spenders, and lower middle and low spenders. Linkage analysis between groups has shown the main differences of the EU countries. For further investigation, the authors have selected twelve countries (France, Denmark, Sweden, Greece, Hungary, Italy, Poland, Czechia, Slovakia, Cyprus, Estonia, Lithuania), i.e. three countries from each group.

Stage 2. Correlation analysis has been applied. Taking into consideration Jarque-Bera (1987) statistics confirming the normal distribution of the variables, the authors have used the Pearson’s correlation. Null hypothesis and alternative hypothesis have been checked: null hypothesis: normal distribution; and alternative hypothesis: not normal distribution. If probability value is ≤ 5 %, null hypothesis should be rejected and accepted alternative hypothesis. Conversely, the null hypothesis is accepted if probability value is > 5%.

Stage 3. The calculation of the intensity rate of structural changes. This indicator shows the shift of the pattern in time \( t \), compare with the basic period. The higher indicator reveals more intensive structural changes of the government expenditure’s pattern analyzed, and conversely. The intensity rate is calculated as follows:

\[
CISC = \sqrt{\frac{1}{r} \sum_{i=1}^{r} (g_{i1} - g_{i0})^2}
\]

(1)

Where: \( r \) - number of considered government expenditure by economic function, \( g_{i1}, g_{i0} \) - the weight of government expenditure by function \( i \) in the analyzed period in year 1 and year 0, respectively.

Stage 4. Estimation of dissimilarities of the expenditure patterns across the countries. Finger-Kreinin dissimilarity indicator (D) measures how much a given distribution differs from a chosen. It is calculated as follows:

\[
D = \frac{1}{2} \sum_{t=1}^{n} |a_t - b_t|
\]

(2)

where: \( a_t \) and \( b_t \) show the share of expenditure by function \( i \) in each of the two distributions. \( D \) index ranges between zero, denoting equality and one, showing maximum dissimilarity.

Next section has described the government expenditure trends.
3. The investigation of the government expenditure trends in EU countries

3.1. The relationships between government expenditure and GDP per capita

Government expenditure in the context of economic performance. In this section, the authors have analyzed the main tendencies of government expenditure and economic growth in the EU countries. The period involves the years from 1997 to 2017. The EU countries have been grouped into four categories, such as high spenders, upper middle spenders, and lower middle and low spenders (Table 1).

<table>
<thead>
<tr>
<th>Groups of countries by government expenditure</th>
<th>Average, 1997-2017</th>
<th>Groups of countries by government expenditure</th>
<th>Average, 1997-2017</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Government expenditure as percentage of GDP</td>
<td>GDP per capita, Euro</td>
<td>Government expenditure as percentage of GDP</td>
</tr>
<tr>
<td><strong>High spenders</strong></td>
<td></td>
<td></td>
<td><strong>Low spenders</strong></td>
</tr>
<tr>
<td>France</td>
<td>54.6</td>
<td>30 205</td>
<td>Greece</td>
</tr>
<tr>
<td>Denmark</td>
<td>53.8</td>
<td>43 743</td>
<td>Hungary</td>
</tr>
<tr>
<td>Sweden</td>
<td>52.3</td>
<td>37 629</td>
<td>Italy</td>
</tr>
<tr>
<td>Finland</td>
<td>52.3</td>
<td>33 329</td>
<td>Croatia</td>
</tr>
<tr>
<td>Belgium</td>
<td>51.7</td>
<td>32 319</td>
<td>Slovenia</td>
</tr>
<tr>
<td>Austria</td>
<td>51.4</td>
<td>34 138</td>
<td>Portugal</td>
</tr>
<tr>
<td><strong>Upper middle spenders</strong></td>
<td></td>
<td></td>
<td>Germany</td>
</tr>
<tr>
<td><strong>Lower middle spenders</strong></td>
<td></td>
<td></td>
<td>拿着手</td>
</tr>
<tr>
<td><strong>Netherlands</strong></td>
<td>44.4</td>
<td>37 081</td>
<td></td>
</tr>
</tbody>
</table>

*Source: authors' calculations based on Eurostat data (2017a,b).*

Using linkage analysis between groups, some interesting tendencies have been revealed. Referring to the average data, the indicators of government expenditure as a percentage of GDP and real GDP per capita have varied across the countries. It is noticed that different countries demonstrate various results of associations between government expenditure and economic performance. There are economically strong countries that are high and upper middle spenders (France, Scandinavian countries, Belgium, Austria, Germany) and economically strong countries that are low and lower middle spenders (the Netherlands, Ireland, United Kingdom, Luxembourg) as well as there are economically weak countries which spend a lot (Greece, Hungary, Croatia, Slovenia, Portugal) and countries which are economically weak with lower middle or low expenditure (Lithuania, Latvia, Estonia, Bulgaria, Romania, Poland, Slovakia). Therefore, there is no evidence on the relationship between government expenditure and economic development. We cannot state that the countries which spend a lot have higher GDP per capita indicator than those which spend less or vice versa.

For further investigation, the authors have selected twelve countries (France, Denmark, Sweden, Greece, Hungary, Italy, Poland, Czechia, Slovakia, Cyprus, Estonia, Lithuania), i.e. three countries from each group.

Jarque-Bera statistics. Before applying the Pearson’s correlation, the authors have to confirm the normal distribution of the variables. For this purpose, we have used Jarque-Bera statistics (Annex A). All calculations
have been based on Eviews v. 8.0. Results have shown that not all variables are normally distributed. Therefore, we have employed the data conversion into log. After that, in many cases the variables have become normally distributed, except the cases of Hungary, Czechia, Estonia and Lithuania.

**Correlation analysis.** The results of correlation analysis across the selected EU countries have been presented in Table 2.

<table>
<thead>
<tr>
<th>Countries</th>
<th>Correlation coefficient, r</th>
<th>t-statistic</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>-0.3260</td>
<td>-1.3800</td>
<td>0.1866</td>
</tr>
<tr>
<td>Denmark</td>
<td>-0.0310</td>
<td>-0.1240</td>
<td>0.9028</td>
</tr>
<tr>
<td>Sweden</td>
<td>0.2942</td>
<td>1.2312</td>
<td>0.2360</td>
</tr>
<tr>
<td>Greece</td>
<td>-0.7635</td>
<td>-5.1534</td>
<td>0.0001</td>
</tr>
<tr>
<td>Italy</td>
<td>-0.1099</td>
<td>-0.3830</td>
<td>0.7084</td>
</tr>
<tr>
<td>Poland</td>
<td>0.0665</td>
<td>0.2904</td>
<td>0.7747</td>
</tr>
<tr>
<td>Slovakia</td>
<td>-0.4752</td>
<td>-2.3542</td>
<td>0.0295</td>
</tr>
<tr>
<td>Cyprus</td>
<td>-0.6496</td>
<td>-3.7247</td>
<td>0.0014</td>
</tr>
</tbody>
</table>

*Source:* authors’ calculations based on Eviews v. 8.0.

*Note:* the level of significance is 5%

As Table 2 has shown, negative and statistically significant relationships between government expenditure and economic growth have been detected in three countries, such as Greece, Slovakia and Cyprus. It has informed about two possible scenarios. Firstly, as the government expenditure increases, GDP per capita growth rate decreases. Secondly, as the economy grows, government spending tends to decline. Moreover, negative correlation between government expenditure and economic growth could signal the inefficiency of the expenditure management. Other countries under consideration have demonstrated statistically insignificant relations. It has been noticed, that the policy–makers should be more focused on determining the optimal level of government expenditure to boost economic growth.

Next section focuses on the structures of government spending.

### 3.2. Managing of government expenditure

This section attempts to answer three questions: (a) what are the policy directions under which government expenditure contributes to economic growth? (b) what are the government spending components that have a stronger impact on growth? and (c) what are the intensity of structural changes and dissimilarities of government patterns across the selected EU countries?

**Productive and non-productive spending.** Referring to the studies of Park (2006), Christie (2012) and Chu et al. (2018), we have classified general government expenditure into productive and non-productive. Productive government expenditure affects private sector productivity and hence has a direct impact on economic growth. Non-productive spending, which has an influence on citizens’ welfare, is likely to have a zero or negative growth impact (Kneller et al. 1999; Chu et al. 2018). Productive government expenditure is a sum of spending on health, education, economic affairs, defence, housing, and general public services, meanwhile, non-productive government expenditure consists of social security, recreation, culture and religion spending (Chu et al. 2018).
Table 3. Average data over 1997-2017

<table>
<thead>
<tr>
<th>Countries</th>
<th>Productive government expenditure, %</th>
<th>Non-productive government expenditure, %</th>
<th>GDP per capita, Euro</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>52.0</td>
<td>48.0</td>
<td>30205</td>
</tr>
<tr>
<td>Denmark</td>
<td>50.8</td>
<td>49.2</td>
<td>43743</td>
</tr>
<tr>
<td>Sweden</td>
<td>53.7</td>
<td>46.3</td>
<td>37 629</td>
</tr>
<tr>
<td>Greece</td>
<td>60.4</td>
<td>39.6</td>
<td>18 857</td>
</tr>
<tr>
<td>Hungary</td>
<td>58.5</td>
<td>41.5</td>
<td>9576</td>
</tr>
<tr>
<td>Italy</td>
<td>54.2</td>
<td>45.8</td>
<td>26 895</td>
</tr>
<tr>
<td>Poland</td>
<td>52.6</td>
<td>47.4</td>
<td>8452</td>
</tr>
<tr>
<td>Czechia</td>
<td>60.5</td>
<td>39.5</td>
<td>13814</td>
</tr>
<tr>
<td>Slovakia</td>
<td>55.6</td>
<td>44.4</td>
<td>11014</td>
</tr>
<tr>
<td>Cyprus</td>
<td>64.2</td>
<td>35.8</td>
<td>21695</td>
</tr>
<tr>
<td>Estonia</td>
<td>56.4</td>
<td>43.6</td>
<td>10848</td>
</tr>
<tr>
<td>Lithuania</td>
<td>60.1</td>
<td>39.9</td>
<td>8490</td>
</tr>
</tbody>
</table>

Source: authors’ calculations based on Eurostat data (2017a,b)

As the analysis of government expenditure has shown, on the one hand, the countries with a greater proportion of productive spending (Cyprus, Greece, Lithuania, Hungary, Estonia, Slovakia) have a low GDP per capita indicator. On the other hand, economically strong countries (Denmark, France and Sweden) have relatively low level of productive expenditure. In this case we can assume, that diverting expenditure from productive to non-productive can promote economic development. However, the conclusions should be taken with caution as we have analyzed only the cases of twelve countries.

Government expenditure by function and intensity rate of structural changes, shows the kind of the spending which dominates in the structure of general government expenditure in the countries under consideration. It is noticed that all countries spend most on social protection involving spending on sickness and disability, old age, survivors, family and children, unemployment and others. Next, spending on health (medical products, appliances and equipment, outpatient services, hospital services and others) prevails in France, Denmark, Sweden, Czechia, Slovakia and Lithuania. Spending on education (pre-primary and primary education, secondary and tertiary education and others) takes a great share in Poland and Estonia. Spending on general public services (financial and fiscal affairs, external affairs, foreign economic aid, general services, public debt transactions and others) dominates in Greece, Hungary, Italy and Cyprus. Hereafter, we will answer the question of which government spending structures have been the most stable and dynamic. It shows intensity rate of structural changes.

Table 4. Intensity rate (percentage points) of government expenditure, 2017 comparison with 1997

<table>
<thead>
<tr>
<th>Country / Activity</th>
<th>FR</th>
<th>DK</th>
<th>SE</th>
<th>EL</th>
<th>HU</th>
<th>IT</th>
<th>PL</th>
<th>CZ</th>
<th>SK</th>
<th>CY</th>
<th>EE</th>
<th>LT</th>
</tr>
</thead>
<tbody>
<tr>
<td>General public services</td>
<td>5.6</td>
<td>5.7</td>
<td>5.1</td>
<td>13.1</td>
<td>8.4</td>
<td>8.9</td>
<td>6.5</td>
<td>1.0</td>
<td>0.6</td>
<td>1.9</td>
<td>1.1</td>
<td>24.4</td>
</tr>
<tr>
<td>Defence</td>
<td>1.3</td>
<td>0.6</td>
<td>1.5</td>
<td>1.0</td>
<td>0.7</td>
<td>0.3</td>
<td>0.7</td>
<td>2.1</td>
<td>0.6</td>
<td>2.7</td>
<td>1.7</td>
<td>2.1</td>
</tr>
<tr>
<td>Public order and safety</td>
<td>0.3</td>
<td>0.2</td>
<td>0.4</td>
<td>2.4</td>
<td>1.5</td>
<td>0.2</td>
<td>0.3</td>
<td>0.1</td>
<td>1.9</td>
<td>0.8</td>
<td>2.4</td>
<td>0.2</td>
</tr>
<tr>
<td>Economic affairs</td>
<td>1.2</td>
<td>0.5</td>
<td>1.2</td>
<td>4.6</td>
<td>4.7</td>
<td>0.7</td>
<td>3.1</td>
<td>4.1</td>
<td>9.7</td>
<td>4.9</td>
<td>0.2</td>
<td>4.3</td>
</tr>
<tr>
<td>Environment protection</td>
<td>0.5</td>
<td>0.2</td>
<td>0.3</td>
<td>2.0</td>
<td>0.4</td>
<td>0.5</td>
<td>0.3</td>
<td>0.4</td>
<td>0.8</td>
<td>0.2</td>
<td>0.1</td>
<td>1.0</td>
</tr>
<tr>
<td>Housing and community amenities</td>
<td>0.1</td>
<td>0.7</td>
<td>1.8</td>
<td>0.4</td>
<td>0.8</td>
<td>0.4</td>
<td>1.9</td>
<td>1.4</td>
<td>0.2</td>
<td>1.4</td>
<td>0.5</td>
<td>0.0</td>
</tr>
<tr>
<td>Health</td>
<td>1.2</td>
<td>4.7</td>
<td>3.8</td>
<td>0.1</td>
<td>0.4</td>
<td>3.0</td>
<td>4.8</td>
<td>3.7</td>
<td>5.6</td>
<td>0.0</td>
<td>1.1</td>
<td>8.0</td>
</tr>
<tr>
<td>Recreation, culture and religion</td>
<td>0.7</td>
<td>0.5</td>
<td>0.8</td>
<td>0.3</td>
<td>4.9</td>
<td>0.1</td>
<td>1.2</td>
<td>0.2</td>
<td>0.3</td>
<td>0.0</td>
<td>0.4</td>
<td>0.9</td>
</tr>
<tr>
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<td>16.3</td>
<td>58.0</td>
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Source: authors’ calculations based on Eurostat data (2017a)
As the table above reports, 2017 compare with 1997, Lithuania and Greece have the most intensive structures of government expenditure. Denmark and France report the most stable compositions of government spending. On the basis of the relationship between intensity rate of structural changes and GDP per capita, we note that economically stronger countries have more stable compositions of government expenditure than economically weaker countries. For example, the average annual structural changes in government spending in Lithuania have been 3.8 times more intensive than in Denmark and France. The high rate of structural changes shows that the government is facing challenges every year when planning a budget. This could signal the absence of a unified policy.

Assessing of the government expenditure patterns' dissimilarity. In order to assess the dissimilarity of the structures of government expenditure across the countries, Finger-Kreinin indicator has been applied. This indicator has summarized how much a given distribution of government expenditure differs from other country. Finger-Kreinin ranges between 0 and 1 or 100%. When value is equal to 0, this means that the structures of pair of countries being considered are identical; and when it is equal to 1 or 100%, this means maximum dissimilarity. Table 5 gives the Finger-Kreinin of government expenditure patterns for all pairings for the period from 1997 to 2017.

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Source: Authors’ calculations based on Eurostat data (2017a)

According to the average values of Finger-Kreinin in the period of 1997 – 2017, some sightings can be identified. Finger-Kreinin indicator has varied in the interval of 4.7% – 23.7%. Assessing the pairs of the countries, the most significant dissimilarity has been revealed between the government expenditure structures of Denmark and Cyprus (23.7%), France and Cyprus (21.1%) and Czechia and Cyprus (20.2%). Moreover, the analysis has suggested that Sweden and France, Sweden and Denmark as well as Denmark and France have the lowest rate of dissimilarity in distribution of government expenditure. It makes 4.7%, 5.3% and 6.5% respectively. Finally, it could be noted, that countries with a similar level of economic development (similar real GDP per capita) have also been characterized by more similar government spending structures. As the economic gap between countries grows, divergence in allocation of government spending increases.

Next section provides the main insights comparing the research results with previous studies.

3.3. Discussion of the research results

As previously mentioned, scientific studies have shown that government can affect economic growth by its size and quality. The relationships among the government size and quality and economic performance have been still a subject of intensive debate among scholars and policy-makers and has reached inconclusive outcomes. The findings of the studies have varied across the countries. The first group of the scientists has found that a larger state sector is growth-impeding (Bergh, Karlsson 2010). The second group has revealed the beneficial
effect of government promoting economic development (Kneller et al., 1999). The third group of the studies have shown that increased government expenditure may slow down the total economic growth because the government may have to raise taxes or borrow money to finance rising spending (Ahmad, Loganathan, 2015).

This research has shown no evidence on the relationship between government expenditure and economic development. We cannot state that the countries which spend a lot have higher GDP per capita indicator than those which spend less or vice versa. Moreover, three out of eight selected countries, such as Greece, Slovakia and Cyprus have demonstrated a negative and statistically significant relationships between government expenditure and economic growth. In the remaining countries, statistically insignificant relations have been found. The results have supported the approach that a larger governmental sector is growth-impeding and increased government expenditure may slow down the total economic growth. According to Devarajan et al. (1996), a country’s desire to reach a more optimal growth rate can be achieved by increasing the proportion of productive expenditure in total government spending. Later, this insight has been partly supported by Chu et al. (2018) examining the relationship between the compositions of government expenditure and economic growth. On the one hand, the study has shown that a shift in government expenditure away from non-productive towards productive spending are associated with higher levels of growth, however, on the other hand, an increase in level of government expenditure has a crowding-out effect and thus negatively impacts on long-run economic growth.

The results of our research have shown that the countries with a greater proportion of productive spending (Cyprus, Greece, Lithuania, Hungary, Estonia, Slovakia) have a relatively low GDP per capita indicator. Economically strong countries, such as Denmark, France and Sweden have relatively low level of productive expenditure. Moreover, economically stronger countries have more stable compositions of government expenditure than economically weaker countries. Finally, it could be noted, that countries with a similar real GDP per capita have been characterized by more similar government spending structures.

Conclusions

This research, on the one hand, has provided more reliable estimates of the interrelationship between general government spending and economic growth. On the other hand, it estimates government expenditure distribution in the EU countries. The scientific studies have shown that the effect of government size on economic growth has been a controversial issue. Government can play both a positive and negative role in economic development.

The analysis has shown, that there is no evidence on the relationship between general government expenditure and economic development in the European Union countries. We cannot say that the countries which spend a lot have higher GDP per capita indicator than those which spend less or vice versa.

Negative and statistically significant relationships between government expenditure and economic growth have been detected in three out of eight countries, such as Greece, Slovakia and Cyprus. It could signal the inefficiency of the government expenditure management. Other countries under consideration have demonstrated statistically insignificant relations. It has been noticed, that the policy–makers should be more focused on determining the optimal level of government expenditure to boost economic growth. Moreover, the results have revealed, that the countries with a greater proportion of productive spending, such as Cyprus, Greece, Lithuania, Hungary, Estonia, Slovakia have a low GDP per capita indicator.

Economically strong countries, such as Denmark, France and Sweden have relatively low level of productive expenditure. In this case we can assume, that diverting expenditure from productive to non-productive can promote economic development. However, the conclusions should be taken with caution as we have analyzed only the cases of twelve countries. It is noticed, that all countries spend most on social protection. Next, spending on health prevails in France, Denmark, Sweden, Czechia, Slovakia and Lithuania. Spending on education takes a grate share in Poland and Estonia. Spending on general public services dominates in Greece, Hungary, Italy and Cyprus.

Also, economically stronger countries have more stable compositions of government expenditure than eco-
nominally weaker ones.

In the economically weaker countries, the intensive rate of structural changes shows that the government is facing challenges every year when planning a budget. This could signal the absence of a unified policy. Moreover, the countries with a similar real GDP per capita have been characterized by more similar government spending structures. As the economic gap between countries grows, divergence in allocation of government spending increases. The research has provided the following guidelines for the policy makers: 1) to focus on determining the optimal level of government expenditure to boost economic growth in the EU countries; 2) to focus on budget planning and unified policy which stimulates economic development; 3) to focus on increasing efficiency of the allocation government expenditure.

References


Tang, T. C. 2009. Wagner’s law versus Keynesian hypothesis in Malaysia: an impressionistic view, *Discussion Paper* 21/09. ISSN 1441-5429.ISSN


### Annex A. Jarque-Bera statistics

<table>
<thead>
<tr>
<th>Countries</th>
<th>Variables</th>
<th>Jarque-Bera statistics</th>
<th>Probability</th>
<th>Test results (Null hypothesis)</th>
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Source: authors’ calculations based on Eviews v. 8.0.

Note: the level of significance is 5%.

### Annex B. Government expenditure by function and its structural change

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</tr>
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<td>------------------------------</td>
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<td>--------</td>
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*Source: authors’ calculations based on Eurostat data (2017a)*

**Gitana DUDZEVİČIŪTĖ** is an assoc. professor of General Jonas Žemaitis Military Academy of Lithuania, Department of Strategic Management. Research interests: sustainable development, economic growth and its determinants, defence economics.

**Vidmantė GIEDRAITYTĖ** is an assoc. professor of General Jonas Žemaitis Military Academy of Lithuania, Department of Strategic Management. Research interests: public sector innovation management, public governance, administrative regulation.
DIGITALIZATION FOR INCREASED ACCESS SECURITY TO HEALTHCARE SERVICES IN LATVIA

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Abstract. The aim of the present study is to consider a range of problems that are to be solved during the implementation of projects that are aimed at increasing the access to healthcare and based on the achievements of the new technological order on the example of Latvia, primarily the e-health project. Since January 1, 2018, the use of the e-health system in Latvia is mandatory, but so far only the “Digital Prescription (e-prescription)” project has been functioning at full capacity. The experience with the introduction and use of digital medicine in Latvia indicates a large range of problems faced by state institutions and local self-government institutions, medical establishments, medical personnel, and patients. A systematic vision of the problems of implementing digital medicine requires a necessity at least to take into account and solve seven relatively independent tasks: technical and technological, economic, legal, organizational, managerial, social, psychological, and cultural ones. In terms of systemic vision, the assessment of these aspects of the e-health programme implementation is presented by means of an extensive use of data retrieved from international organizations, Latvian state statistics, scientific research studies, including the ones carried out by the authors. The main conclusion of the study is the need for the theory and the practice of the increasing access to healthcare based on digital medicine, taking into account a more complete variety of factors that stimulate and constrain this process, and involving specialists from the sphere of social sciences.

Keywords: digital medicine, access to healthcare, e-health, blockchain, digital development

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JEL Classifications: O31, I15, P36

Additional disciplines: information and communication; sociology.

1. Introduction

Since time immemorial, it has been a human tendency to come together in order to achieve common goals and to enhance performance. Over time, possibilities of cooperation are expanding, new methods of communication are emerging, pace of technological development is speeding up, and forms of capital are being transformed. An understanding and a wider use of the aggregate capital of individual, family, and society, including network capital, is becoming increasingly important (Menshikov, Lavrinenko et al. 2017). Endre Sik, sociologist, who significantly contributed to the study of network capital, writes: “In the course of transformation, all other forms of capital (monetary, physical, human capital) were scarce and/or lost their value, therefore trust and network capital have become the main assets that are often the most important forms of capital, ensuring success in this growing informal environment” (Sik 1994a; Sik 1994b). Whereas communities were previously coming together because of the geographical position, today cooperation is based on common interests, and the newest technologies. At the new historical stage, in the age of informatization and computerization, it is appropriate to consider social relations from a new perspective and in a new context.
2. Statement of the research problem

The influence of Information Communication Technologies (ICT) on access to healthcare is also being actively studied. The experts believe that the introduction of the e-health system should help to overcome the numerous economic, geographical and social barriers that impede access to healthcare, as well as to compensate for the shortage of medical personnel (OECD 2010; Deloitte Center of Health Solutions 2015; Chistobaev et al., 2018). The influence of ICT on accessibility, namely on the universal access of the population to health care services, is being discussed in numerous global studies (Al-Shorbaji 2013; Roth et al. 2015; WHO 2016b; Panfiluk, Szymańska, 2017; Novillo-Ortiz et al. 2018; Bernardi, 2019). In particular, Al-Shorbaji (2013), analysing the issues related to the role of ICT play in the increasing of access to healthcare, focuses primarily on the role of the information literacy of medical workers: the use of innovative approaches and eLearning in support of health education and education of health work force has been established as a major area of interest for both WHO and its member states within the eHealth domain; the Health Academy eLearning modules and the collaboration with member states and technical departments have taken a new turn through the current effort to conduct systematic reviews of the evidence for eLearning. Of course, in reality, there are much more problems related to the introduction of ICT (e-health systems and other achievements of digital medicine), and these problems are not related only to information literacy.

Without doubt, the access to healthcare is also determined by the economic impact of the e-health system. First of all, this is the impact on public health expenditure. In an aging society, we spend on healthcare more than ever. Since 1970, the life expectancy of a child born in OECD countries has increased by 10.7 years. On average, we now live more than ten years longer than almost fifty years ago (even longer in the EU – for 15 years). At the same time, the average health expenditure almost doubled from 4.5% of GDP in 1970 to 8.9 in 2015 (Arak, Wójcik 2016-2017). As soon as the introduction of the e-health requires huge public investments, there is a necessity to provide evidence of obvious benefits to patients, healthcare providers and the public at large (OECD 2010).

As a rule, the emphasis is on the technical feasibility and successful implementation of the system, while the economic approach is of secondary importance. However, as WHO experts note, it is economy and value to society that ultimately determine whether the system will survive. Health organizations, public or private, must predict a positive return on investment (financial or others) in order to receive continued financial, institutional and political support for their efforts. Nevertheless, although health organizations can (and in many cases do) improve care and meet unmet public healthcare needs (“social justification”) by means of introducing ICT, it is usually difficult for these organizations to demonstrate economic benefits (“Economic justification”), including the data on whether their own financial performance is improving (OECD 2010).

To date, the project for the establishment of a global telecommunications network in medicine, funded by the World Health Organization (WHO) is at the final stage of its implementation. The project includes electronic exchange of scientific documents and information, accelerated search with access via telecommunication networks, conducting electronic voting of experts, video conferences, and possibility to conduct electronic voting and arrange meetings (WHO 2016a).

The apparent advantages of the e-health system include the possibility of “erasing” the space-time boundaries in the field of healthcare and the increase in the speed of processing information with the help of modern technologies: “the sooner the treatment is started, the greater the chances of full recovery are”. According to our assessment, digital medicine has a positive effect on all four mutually intersecting parameters of accessibility defined by WHO: information accessibility, physical accessibility, economic accessibility, non-discrimination. Unfortunately, the project managers who work in this area not always focus on all these e-healthcare benefits.

Today blockchain is, perhaps, the most mysterious technology associated with “digit”. It is not known who actually created it. For a long time the possibility of its use was closely associated with cryptocurrency and
considered by many countries as a threat to their national monetary systems. But recently, a number of experts have predicted that in the near future there will be a full-fledged replacement of state functions with mechanisms built on the basis of blockchain technology.

The idea of blockchain technology is as simple as possible – it is a huge public database that operates without centralized management. The main features of blockchain are:

- **transparency** (network members see all information about transactions);
- **irreversibility** (a recorded transaction cannot be deleted or modified);
- **anonymity/pseudonymity** (relative security for users from countries with authoritarian regimes);
- **decentralization** (absence of a single server that could be influenced).

That is why the characteristics of blockchain technology have become increasingly used in various spheres of life of individual and society, including concerns for the health and quality of life of the population. Experts state that digital medicine rests on three pillars: electronic flow of documentation, telemedicine (technologies for remote consultation with a doctor, exchange of information between medical organizations) and the use of mathematical data processing methods. It is the third component of digital medicine (a huge leeway for the application of artificial intelligence methods) that actually gives medicine a new quality. Our traditional medical records contain a huge amount of information. But, from a global point of view, all this wealth, figuratively speaking, is going to waste. However, if medical records are digitised into an electronic form, then mathematical algorithms can analyse all these data and find patterns in them that are imperceptible to the human eye. Besides, this will make it possible not only to make the most accurate diagnosis, but also to predict the risk of developing a particular disease long before the onset of its clinical symptoms.

3. Digital medicine as a complex phenomenon

The Ministry of Health of the Republic of Latvia started to think about the e-health project as early as 2003, the working group appeared in 2005, but a specific plan was written only in 2006. A year later, its implementation was initiated.

It was assumed that, as a result of the project, the efficiency of the work of medical personnel would increase by 22%, the outpatient waiting time would be reduced by 16%, and the contact time between the healthcare provider and the patient – by 5%. However, doctors themselves should see a greater impact – according to projections, the minutes that are now spent on studying the patient’s medical history will be almost a third less. The e-health programme, i.e. a state long-term priority programme to improve the healthcare system in Latvia, envisaged three stages of its implementation (see Figure 1):
However, only from January 1, 2018, the use of the e-health system in Latvia is mandatory. For the time being, only the “Digital Prescription (e-prescription)” project has been functioning at full capacity. Every year, up to 15 million of prescriptions are written out. The new system has allowed to automate the process, to track the entire life cycle of a prescription from the moment it is written out until the dispensing of the medicine. It has reduced the time used for filling in documentation, the risk of errors due to the notorious “doctor’s handwriting”, etc. The system is integrated with a register of medicines and a list of compensated medicines.

The experience in introducing and using digital medicine in Latvia indicates a large range of problems faced by state and local self-government institutions, medical establishments, medical personnel and patients, which significantly impede the expansion of the access to healthcare. The most significant of them can be considered in the complex, which includes barriers and restrictions that are significantly different in their characteristics. In this aspect of our research analysis, we propose to consider the following 7 groups of such characteristics.

1. Technical and technological problems

The healthcare industry has long been in need of change, and today there are many opportunities for blockchain technology to lead the transformation. But the technology has already been in existence for more than 10 years; and we will be right claiming that it has made little changes so far. Except, perhaps, the financial sector that has experienced its impact.

Interest in blockchain technology has become more noticeable in the last 3-4 years, including the interest shown to it in the sector of healthcare. The increased demand for blockchain technology can be proved by the results of a study carried out in October 2017 by a team “Black Book” (Black Book Research 2017). It surveyed 88 healthcare consumers (among them were representatives of insurance companies, consumers of medical servic-
es) and 276 healthcare providers (specialists responsible for technology process, managers and IT specialists). “Black Book” revealed that 19% of managers in medical organizations and 76% of representatives paying for medical services were considering the possibility of using blockchain-based technologies or had already been using them. 70% of various organizations that pay for medical services expected blockchain integration into existing systems, and 9% of healthcare providers were planning to start using the new technology as early as 2018. Accordingly, the increased attention to distributed ledger technology had led to an understanding of the potential application of technology in the healthcare system. These conditions had provided fertile ground for teams and organizations wishing to integrate blockchain technology into existing projects or develop new ones that would meet the requirements of high standards.

In 2013, the European Commission conducted a large-scale survey on the deployment of e-health among general practitioners. Denmark achieved the highest score (2.49 out of a possible 4); it was followed by Spain (2.17), Norway (2.16) and Estonia (2.13). Latvia and Lithuania had the lowest scores – 1.50 and 1.35, respectively (Codagnone 2013).

A study on the deployment of e-health in European hospitals was also conducted in 2013 (in 2010, a similar survey was conducted, but with a smaller sample). 2 indicators were evaluated (European Commission 2014):

1) distribution in relation to four “core” dimensions of e-health: digital infrastructure; application and integration; information flows and health information exchange; security and privacy.

2) availability and use concerning digital applications and functionalities: electronic health record; clinical decision support tools; TeleHealth (remote medical consultation).

Hospitals in the Nordic countries achieved higher scores on both indicators. Hospitals in Eastern and Southern Europe had lower scores. Larger hospitals and public hospitals recorded higher scores on both indicators. Latvia had relatively low scores and was ranked 25th out of 30 countries on both indicators. Overall, these results show gaps in governance with regard to data security, privacy and interoperability. Only 57% of hospitals reported having a strategic plan for e-health.

Experts of the European Commission point out that proceeding from the results obtained, it is necessary to improve the adoption of digital technologies in both primary healthcare and hospitals across Europe in order to fulfil the vision outlined in the European Commission e-Health Strategy (OECD/EU 2016).

According to Report 2018 published by the European Commission concerning DESI (Digital Economy and Society Index), in terms of the development of digital economy and society, Latvia ranks 19th in the EU (European Commission 2018). The DESI is a composite index that summarises relevant indicators on Europe’s digital performance and tracks the progress made by EU member states in digital competitiveness, taking into account five key components: availability of high-speed Internet, digital skills of the population, level of the use of Internet, integration of digital technologies into business and digital public services (such as e-government and e-health). The e-health indicator is a percentage of state residents who use e-health services. According to this indicator, Latvia also ranks 19th, Lithuania – 13th, and Estonia – 2nd. In 2017, nearly 50% of Estonian residents used e-health services, about 20% of Lithuanians and less than 15% of Latvians (Figure 2). The EU average is 18%.
2. Economic problems that indicate rather large financial expenses for the promotion of digital medicine. Thus, according to the information provided by the company *Start Up Health*, in 2017, investment in digital medicine was $11.5 billion, which is $3.5 billion more than in 2016 (*Start Up Health Insights* 2018).

At the same time, the fourth quarter of 2017 was a record for all the years: in this period, 227 investment transactions with a total amount of $2.3 billion were concluded. In addition, the company noted that the year ended was a record in the number of transactions: 794 contracts that exceeded $1 million. As before, most of these transactions (65%) are related to projects that are at an early stage of their implementation. Though, the number and volume of investments in the companies that are at the later stages is increasing.

The top 5 deals of 2017 (excluding *Outcome Health* contract in the amount of $800 million) are *Grail* ($914 million), *Guardant Health* ($360 million), *Peloton* ($325 million), *Auris* ($280 million), 23 and *Me* ($250 million).

The top 5 sectors of the industry that were invested most were systems aimed at the improvement of patient experience (Patient/Consumer Experience) – $1.64 billion, personalized medicine – $1.59 billion, big data and analytics – $1.39 billion, medical devices – $1.37 billion, and systems for a healthy lifestyle (wellness) – $1.12 billion.

The most active geographic areas where investments were made in this field were San Francisco and New York (USA), London (UK), Tel Aviv (Israel), Bangalore (India), Stockholm (Sweden), Toronto (Canada), Beijing (China), Boston (USA) and Paris (France).

In 2018, the United States still was the most active region in terms of investment, as such transactions were most often recorded in San Francisco, New York, Boston and Los Angeles. As for the rest of the world, the UK, China, Sweden, India, Singapore, Canada and Israel were the most active ones.

In 2018, the major investments were made in the following sectors of the industry(*Start Up Health Insights* 2018):
- patient empowerment ($2.1 billion in 149 transactions);
- wellness ($1.6 billion - 64 transactions);
- biometric data acquisition ($1.5 billion - 50 transactions);
- clinical workflow ($1.1 billion - 98 transactions);
- admin workflow ($1.0 billion - 85 transactions);
- research ($964 million - 37 transactions);
- personalized health ($857 million - 54 transactions);
- medical insurance ($854 million - 12 transactions);
- population health ($701 million - 27 transactions);
- education ($280 million - 11 transactions).

In Latvia, against the backdrop of an impressive amount of investment in digital medicine in the leading countries, expenditure on this sector does not seem very large.

Thus, the total amount allocated for the projects to implement the e-health system in Latvia, co-funded from the European Regional Development Fund, was initially EUR 10.2 million. This financing was distributed among eight developers: LattelecomTechnology – EUR 2.9 million; Datorzinibucenrsts and ABC Software – EUR 3.5 million; In-volv, TietoLatvia and ABC Software – EUR 576 000; Lattelecom and Exigenservices Latvia – EUR 3.2 million.

However, from the very beginning there was a problem of the effective use of this financing. The state controller of the State Audit Office of the Republic of Latvia claimed that the loss of revenue for the state due to the inactive e-health project in 2013-2015 was EUR 3 million. This is exactly this amount of money that could be saved if only at least a part of the services had worked. The total amount of EUR 760,000 was spent unproductively or uneconomically, and EUR 483,000 was spent for inappropriate purposes.

In this context, a comment made by one of the users of the portal Delfi.lv, who familiarized themselves with the evaluations given by the controllers, deserves attention: “As an independent developer, I estimate the implementation of the part that is visible to individuals as a work done for 120 hours. This includes an optimally configured database, design, forms, etc. Everything, entirely. Suppose that the part for doctors is more difficult, it will take 200 hours. Let’s throw another 50 hours for related work. Total 370 hours. My rate is 45 euros per hour. Total 16650 euros for the entire system, which will not be slow, will look normal and will operate normally. OK, let’s increase it up to 50,000. Anyway, it’s a lot less than millions. Where have all these millions gone?? Why was it necessary to attract so many companies? The answer, apparently, is simple: corruption and feeding. This is what KNAB should do! but they won’t, of course”. Of course, of course, nothing is ever that simple, but the quality of the system and the cost of its implementation in Latvia are certainly far from optimal values.

3. Legal aspects, security issues

It is necessary to pay attention to the fact that, despite the obvious success, the development of digital healthcare still has certain limitations in the practical aspect; this situation is due to the existing ethical and legal risks of using electronic technologies in medicine. First of all, it is about respect for confidentiality of patients’ data, respectively, medical confidentiality, which is one of the basic rules in deontology. In the legal aspect, the risks of the development of digital medicine are caused by the inconsistency of international legal norms regulating the activities of treatment-and-prophylactic institutions and their personnel with the current national legislation in the field of healthcare.

The question arises: would it be possible for evildoers to take advantage of this personal information? Hackers will give a lot to get the medical file of a major politician or a businessman. To prevent this from happening, a multi-level system of personal data protection is to be produced.

For example, in Balashikha, Moscow region, the employees of the Moscow regional ambulance station were selling data about the deaths of the local residents to funeral agencies. This was reported on the website of the regional Investigative Committee (IC) of Russia (RIA Novosti 2019). The employees of the funeral agencies used the information they received to get to the place of residence of the deceased. They offered their services to the relatives of the deceased and concluded contracts, the percentage of which was given to the doctors.
In addition, one cannot exclude technological risks due to the complexity of the equipment used. Y. N. Harari’s report at the Davos forum (January, 2018) contained shocking warnings about “digital dictatorship”, which may arise as a result of the concentration of information in integrated centres. Especially information on health.

“When computers start tracking not only our emails, messages and money, but also our bodies, the vulnerability of each individual will increase ... When you combine the information technology revolution with the biotechnology revolution, you get an opportunity to hack people” (Harari 2018).

In the world, the scale of computer crimes has become avalanche-like. They shake the largest banks, corporations and even military departments, secret services and governments of many countries. This indicates a sharply increasing danger of using computerized data storage and processing systems, especially for ordinary people who trust their personal data to these systems. Stricter, more precise legislation is needed to protect us from outside interference in medical information. To avoid this, it is necessary to create and improve a multi-level system for the protection of each patient’s personal data.

4. Organizational and managerial problems

The transition to digital medicine is a complex management task requiring a well-thought-out and well-considered strategy. This is expressed in the choice of the level of cooperation, coordination of actions, “networkization” and integration. The elaboration of a quality strategy depends on the organizational and managerial experience of managers, who are able to offer and implement optimal under specific conditions solutions to the many complex problems of digital medicine. Of course, personal and professional competencies of a manager, who makes decisions, largely determine the success or failure in the deployment of the entire set of elements of the most complex system of a new technological order.

In our assessment, these were not financial, but organizational problems that were primarily hampering and holding back the deployment of digital medicine in Latvia. For more than 10 years, the e-health project had been being implemented according to the old plans drawn up in 2006–2007, when many more significant technological innovations used in digital medicine even did not exist. The terms of the project’s implementation were constantly postponed (in general, initially the project was supposed to be completed in 2010). Because of the economic crisis, the “contracting authority” responsible for the project was being changed several times. Thus, in 2009, the functions of deploying the e-health system were given to the Centre for of Health Economics, and, from the end of 2011, the project was transferred to the National Health Service, which is implementing it now.

Having started the work, the current Minister for Health in Latvia, Ilze Viņķele, decided to even suspend the 3rd stage of the elaboration of the e-health system, for which it was planned to spend EUR 5 million. According to I. Viņķele (2019), e-health is a failed system, a sick from birth and incorrectly attended at delivery child. She personally would completely curtail the current e-health project. But, to her regret, the fact is that there are certain commitments to funding from the EU funds, which the Latvian organizers of healthcare assumed by implementing e-health.

5. Social problems

It is known that the problem of unequal access to medical services, despite the efforts made by the world community, is due to the social determinism of human health in modern society (Menshikov, Volkova et al. 2017). Therefore, the overcoming of this problem entails certain socio-economic risks and determines a necessity to search for new approaches for solving it. In the conditions of the modern development of the global community, the deployment of information and communication technologies (ICT) into medical practice and system organization of health services, and the creation of a digital health system seem to be one of the possible approaches. The use of digital technologies in medicine has allowed to produce completely new forms of interaction between medical service providers and their consumers.

In the latest scientific literature, the issue related to the impact of e-health on social inequality of society is
topical (Latulippe, Hamel, Giroux 2017). The authors of numerous studies have identified a number of socio-demographic characteristics that determine a part of population that is at risk of social inequality and limited in the possibilities of using e-health tools.

It should be noted that, due to socio-economic differentiation of developed and developing countries, the ways of the use of digital technologies in healthcare of these states have certain differences. For example, in Europe and America, they are widely used for diagnosis and clinical treatment, while in regions with low per capita income, their deployment is limited and so far is used to collect data, to disseminate information and to set up communication between healthcare providers and their consumers. This situation gives some researchers a reason to consider the limited use of digital technologies in solving the problem of social inequality in health (Lyadova 2018).

The first “non-economic” problem the residents tell about during sociological surveys is the poor quality of healthcare and the inaccessibility of medicine. At the same time, trust to doctors is reducing, and the existing system for assessing the quality of medicine raises many questions. Public dissatisfaction with healthcare is quite predictable, since the state is chronically underfunding this area.

Of course, digital medicine has a significantly different influence on the social stratification of society, on social classes and strata, population of different regions, age and other groups with demographic specificity. The ubiquity of information and communication technologies is changing everything, including the concept of social norms, factors and criteria of social stratification. It is high time to introduce into scientific use such a factor of social stratification as online or offline, as well as the concept of “digital deprivation” or “digital literacy”. Researchers understand digital deprivation as a situation when a way of life, that is customary for most people, turns out to be impossible because of the lack of ICT skills or a desire and an ability to acquire them. Although today the non-use of a wide spectrum of electronic services is not perceived yet in our society as deprivation, the narrowing of opportunities and the disadvantaged offline individuals are becoming more noticeable. Anyone, who does not live online today, lives in a world of increasing deprivation. There is a need to apply a deprivation approach to poverty introduced by the British specialist P. Townsend (2010) in the consideration of digital deprivation.

This will help to overcome the technocratic approach to the study and use of ICT. In world science and practice, such an approach has long been complemented by a humanitarian one, in which the main focus is not on the technical side of things, but on a person, who is using information and communication technologies and services, and on the studies of their use.

6. Psychological problems

In our opinion, one of the most significant factors that is holding back the growth of digital medicine in Latvia is not the absence of ideas, but the existence of high psychological barriers and a problem of audience trust, which makes the cost of the paying user deadly high. No less significant is the fact that a part of medical personnel is wary and restrained towards digital medicine.

In Russia, the views of the representatives of the medical community on digital medicine and hospital automation have been analysed. There are given the results of the surveys of general practitioners on communication with their patients, telemedicine and remote diagnostics, as well as of managers from medical organizations on informatization, the development of hospitals related to the introduction of telemedicine into their work and automation of business processes (Kubryk 2017).

In May 2017, a sociological research of a group of representatives of medical community – general practitioners and healthcare organizers (n = 1125) was carried out. The respondents were divided into 2 groups: “Doctors” (n = 1024) and “Managers” (n = 101). The group “Doctors” included representatives of almost all specialties, there were a lot of (totally 50%), endocrinologists, cardiologists, paediatricians, oncologists and gynaecologists.
In general, the researchers believe that there is an annual increase in the medical community’s awareness about telemedicine, electronic medical records, and portable devices. Most of the “Managers” understand telemedicine as a “patient-doctor” interaction, while general practitioners – as a “doctor-doctor” interaction. High willingness to use remote patient tracking tools was identified among general practitioners and health-care organizers; moreover, the majority of the respondents already have some experience in this issue and are ready for further training. There is a better automation of the processes of interaction with patients in private medical organizations than in public ones. One can speak of a satisfactory level and a constant increase in the awareness of general practitioners and public health organizers about the key aspects of the use of information technologies. Unfortunately, in Latvia, the healthcare organizers have not yet bothered to study the issues of awareness and psychological characteristics of health workers in the context of the problems digital medicine faces. We are far from being serious about taking into account the psychological, cultural and social characteristics of digital medicine users, its impact on the performance of medical personnel and the quality of life of the population.

The former Minister for Health, now a Member of the Saeima, Anda Čakša, agrees with the words of the new head of the Ministry of Health, Ilze Viņķele, that the healthcare system in Latvia is “not oriented to a human, as it is self-oriented”. A. Čakša believes that the entire process that has been going on for 28 years was carried out according to this scheme: “I often had to say to the National Health Service – there is a feeling that you yourself cannot understand what a mess you have made”. According to her, sometimes it seemed that in Latvian medicine even the doctors themselves did not understand the essence of the process and did some things in a certain way just because someone had come up with these suggestions.

Only a year after the launch of the e-health system, the organizers of our healthcare finally decided to involve doctors and other medical workers into it to increase its efficiency. Recently, the new head of the Ministry of Health of the Republic of Latvia, I. Viņķele, told about the current process of the further implementation of the e-health system: “We are also creating a council of users who will have to work with this miracle every day. One of the big mistakes of the previous stage – doctors were not asked what they needed from this system, how functional it was. In order not to repeat these mistakes, the elaboration of the third stage is happening with the direct participation of the people, who will use e-health” – it is about time.

7. Sociocultural problems

New phenomena of the technocratic world, its volatility, fluidity, multi-platform and multi-channel nature make the contemporaries live in conditions of media redundancy and form a certain set of skills, called “digital literacy”. Berman N.D. (2017) gives the following definition of this concept: “Digital literacy is defined by a set of knowledge and skills that are necessary for the safe and effective use of digital technologies and Internet resources ... this is a person’s ability to use digital tools (in the broadest sense) with benefit for himself. The concept of “digital literacy” includes three components: digital competence, digital consumption and digital security”. Digital literacy encompasses a number of technical, personal and intellectual skills such as: a skill to quickly search, to analyse and to evaluate information, to navigate in media streams; skills of lifelong learning, dialogue with the mass media, recognition of various manipulations from the media, as well as from individual users and user groups, etc. (Shamshurin 2018).

A large-scale study in Latvia (Holma 2017) has revealed that, in general, the country’s population still lacks knowledge and competence in information literacy, including the ones in the field of health.

Estonia was one of the first countries in the world to switch to the e-health model. However, it did not happen immediately. The project of “digitization” of the healthcare system was one of the elements of a large-scale state programme to deploy Internet technologies in the public administration and business that the neighbouring country has been consistently implementing since the 1990s. By the time e-health was set up, Estonian residents already had an opportunity to vote on the Internet in elections and to file tax returns, to approach to banks, to state and municipal institutions without leaving home. But the most important thing is that in 2008,
when Estonian medical institutions started to switch to a new format of their work, in the country, almost all its residents had their ID cards with a chip and a possibility of electronic signature that allowed to identify any user. This circumstance increased the public confidence in the innovations, provided a possibility for data security control and allowed to deploy a fairly wide package of services in the system at once.

In February 2017, at the World Government Summit, the Estonian electronic healthcare system was awarded the prize for the best technological solution. The award expresses appreciation to the government, which provides efficient and quality services through technological solutions. Innovative projects that change people’s lives for the better are honoured.

Conclusions

Our analysis of the deployment of the achievements of digital medicine considered on the experience of creating and using the e-health system in Latvia confirms the complexity and multidimensionality of the process of mastering the latest technologies, in this case affecting the deep foundations of interaction between individual and society. The process is gradually moving away from a simple and rather primitive sphere of interaction of medical institutions with patients into an ever-expanding network of communications with a difficultly predictable number of subjects that directly or indirectly affect the health and quality of life of the population, ideally – without any geographical restrictions. Accessibility and quality of medical care is moving further away from a simple solving of purely economic problems: it requires ever more careful consideration and solution of technological development problems in the social subsystem of society, information literacy of the entire population of the country, and formation of a new management culture. The further study of this issue requires new research efforts, the use of other analysis tools (SWOT, cluster analysis, methods of social psychology, etc.).

Table 1. SWOT analysis of factors that influence the implementation of e-health project

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
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<tbody>
<tr>
<td>-project implementation in the international and European context</td>
<td>-relatively slow implementation and deployment of the e-health system that incurs economic and social losses and expenses costs</td>
</tr>
<tr>
<td>-EU financial assistance</td>
<td>-low quality of work of managers and designers of the e-health system</td>
</tr>
<tr>
<td>-noticeable expansion of accessibility in its all 4 dimensions, especially in the aspect of prescription drug accessibility</td>
<td>-absence of purposeful work to eliminate and prevent economic and social losses</td>
</tr>
<tr>
<td>-generally positive attitude of healthcare workers and patients towards reliably working elements of the e-health system</td>
<td>-absence of commitment of healthcare organizers to the timely application of advanced international experience in medicine, legal practice and technology</td>
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</table>

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Threats</th>
</tr>
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<tr>
<td>-help of international organizations</td>
<td>-threat of return of the funds to the EU fund in case of failure in the implementation of the project</td>
</tr>
<tr>
<td>-various actions (seminars, conferences, exchange of experience, etc.) for healthcare workers on more efficient and high-quality use of the e-health system</td>
<td>-presence of a threat to the low degree of the protection of each patient’s personal data and the discredit of new technologies</td>
</tr>
<tr>
<td>-expansion of the use of telemedicine as the most important means of expanding the accessibility of medical services</td>
<td>-lagging behind in adopting information technologies</td>
</tr>
<tr>
<td>-search for possibilities to more fully and positively cover the work of the e-health system in the media</td>
<td>-low rates of increase in information literacy of medical workers and patients</td>
</tr>
<tr>
<td>-sustainable improvement of medical and digital literacy of the population</td>
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Source: created by the authors
As is widely known, SWOT analysis is one of the most effective tools in strategic management, including at the national level. Thus, our SWOT analysis (see Table 1) demonstrates and explains that the development of new technologies on the example of the e-health system requires the targeted efforts of the entire society, and not just of one of its subsystems. Numerous internal and external factors, both stimulating and hindering the adoption of technological innovations, should be timely taken into account in strategic planning, and the problems to be identified should be solved not only by ICT specialists, but by a qualified team with the involvement of representatives of social sciences (economists, sociologists, lawyers and others). Latvia has this kind of experience, when a topical theme under analysis is subjected to a kind of deep audit by a sufficiently qualified team of diversified specialists within the framework of the periodical inter-university projects “Latvia. Human Development Report”.

References


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INVESTMENT SECURITY MODELS IN MERGERS AND ACQUISITION AGREEMENTS FOR INTERNATIONAL CORPORATIONS

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Abstract. The scientific paper identifies strategic motivational factors for using mergers and acquisitions to maintain a high level of investment security. Investment security models in mergers and acquisitions based on the concepts of value attractiveness and discounting corporate cash flows during growth have been developed and practically tested. A parametric relationship has been formed between the price of the shares of the integrative corporate structure and the initial conditions of the integration transaction for both the acquiring corporation and the target corporation with a view to fair distribution of benefits from mergers or acquisitions.

Keywords: investment security, mergers and acquisitions, security model, equity, market capitalization, shareholding, transaction participants, corporate synergy, variations in corporate profits.


JEL Classifications: C 42; F 23; F 39

1. Introduction

The relevance of the study is due to the fact that in the situation that has developed up to the present for international capital in the world of the economic situation a very acute problem is overcoming the crisis and getting out of it with the lowest possible losses. There is a need to search for effective in times of crisis models and methods for the development of corporations, solution of the challenges of maintaining market presence, ensuring uninterrupted production. One of the modern methods of solving the problem of survival for corporations is the restructuring of property and mergers and acquisitions as one of the main elements of improving the efficiency of the company’s capital.

Over the past decade, international agreements on mergers and acquisitions have been quite active, to which the economic literature has paid sufficient attention, focusing on the analysis of the prospects of these agreements. Any corporation has two principal options for its growth strategy — its own development based on internal resources or an acquisition of an external asset (Bilan, 2013). In the process of continuous development, within the framework of the existing strategy of the corporation, at any given moment the management determines that the most profitable for it is the acquisition of a new business, or the redistribution of resources within the framework of existing types of activities (Abrhám, Lžicar, 2018).

Accordingly, the purpose of acquiring a new business through mergers and acquisitions is to create a strategic
advantage by joining and integrating new elements of the business, which is considered more effective than their internal corporate development (Drobyazko S., 2017; Drobyazko S., 2019).

That is why the presence of a methodological approach to determine the deployment models of a merger and acquisition transaction, its future benefits and profitability for both the buyer and the seller, will help to increase their efficiency, which determines the economic relevance of the study.

2. Literature Survey

The following scholars have greatly contributed to the study of the problems and the empirical basis for the use of mergers and acquisitions among international corporations and structures: (Cassiman, Colombo 2006; Gaughan, 2007; Godbole, 2009; Hair, Lukas, 2014; Roberts, et. al., 2010; Sherman, 2010; Tencati & Perinni, 2006; Čirjevskis, 2017; Načisčionis, et. al., 2018; Petrenko et al., 2018; Taronavičienė, 2019; Koval et al., 2019).

But at the same time, we can assert that the quality of planning and positive organizational and economic changes in the implementation of mergers and acquisitions are still at a low level, and planning of cost effects and stock price forecasting models after the end of the transaction becomes a special stage. This direction requires the improvement of new methodological approaches to the organization of integration interaction among international corporations and the improvement of the status of the indicator of the expected value of the transaction from mergers or acquisitions, as a leading guide for international investors (Taronavičienė, 2018; Girdzijauskaite et al., 2019).

The purpose of the article is to develop a methodological approach to the formation of models of the formation of cost benefits for the acquiring company and the evaluation of the investment value of the target company when using mergers and acquisitions.

3. Methods

Now the majority of business owners pay considerable attention to the strategic management of corporations, which is associated with increased market competition and capital concentration processes. At the same time, integration through mergers and acquisitions becomes one of the factors for the growth of market power for international corporations, which forms variations or patterns of organizational benefits for participants in these agreements (Boufarah, Spatoliatore, 2012; Galpin, and Herndon, 2010).

4. Results

Model “1”

Let’s use the investment model of net present value (NPV) to analyze international mergers and acquisitions. For the selling corporation, this figure will be:

\[ NPV_s = \delta \times P_{bs} - P_s + CASH, \]

where

- \( P_{bs} \) – value of the equity capital of a corporation formed by the DCF model (discounted cash flows);
- \( P_s \) – value of the equity capital for the target corporation, determined by the DCF model;
- \( CASH \) – cash paid by the target corporation;
- \( \delta \) – share of shareholders of the target corporation in the new integration structure.

\[ \delta = \frac{ER_b \times N_s}{N_b + ER_b \times N_s}, \]

where:

- \( ER_b \) – ratio of the exchange of shares of the target corporation for shares of the purchaser with the model «1»,
the most acceptable for the acquiring corporation;

\( N_s \) – number of shares of the target corporation (seller);

\( N_a \) – number of shares of the acquiring corporation

The minimum possible exchange ratio is lower because NPVs = 0 for the target corporation, while the purchaser takes all the enormous earning.

We can show that:

\[
ER_b = ER_k \times F_b
\]

where:

\[
ER_k = \frac{N_b \times P_s}{N_s \times P_b} \times \frac{P_s / N_s}{P_b / N_b}
\]

\[
F_b = \frac{1 - \frac{CASH}{P_s}}{1 + \frac{CASH + SE}{P_b}}
\]

\( P_s \) – value of the acquiring corporation determined by the DCF model;

\( S_E \) – value of the synergistic effect of the integration of the two companies.

With this ratio, the entire volume of the increase in the market value of integration falls on the purchaser (all the enormous earning is taken by the acquiring corporation).

The value of \( ER_k \) is the ratio of the market price of one share of the business selling corporation \( (V_s = P_s / N_s) \) to a similar value \( (V_b = P_b / N_b) \) of the acquiring corporation, and in a certain sense it can be interpreted as some initial, maximum for this option of estimating value of the share exchange ratio, which can further decrease depending on the value of the factor function \( F_b \), which in turn is dependent on the value of the synergistic effect resulting from the integration of \( S_E \) corporations, cash, paid for the target corporation – CASH and equity values of both corporations \( P_s \) and \( P_b \) (Boone, and Mulherin 2007).

Thus, the ERk indicator is the stock exchange ratio for a swap merger of companies, when \( CASH = 0 \) (that is, there are no objects of acquisition) and all other values peculiar to the processes of mergers and acquisitions that are included in the expression for determining the net present value in proportion to the contribution of this corporation to the combined corporate structure (Fry, & Cheah, 2016). Thus, the price of one stock of the target corporation – \( V_s \), will be determined as the multiplying the exchange ratio \( ER_b \) by the price of one share of the acquiring corporation – \( V_b \), that is:

\[
V_s = ER_b \times V_b = ER_k \times F_b \times V_b
\]

In other words, in proportion to the change in the factor function and the change in the exchange ratio, the price of shares of the target corporation will also change.

It can be argued that the enormous earning \( EE_b \) that a purchaser of a business receives is equal to:

\[
EE_b = SE - AC
\]

where \( AC \) – presented value of additional costs of mergers and investments in a new corporate structure.
It can be shown that regardless of the distribution of benefits from mergers / acquisitions, the value of $EE_b$ does not change and is equal to the total income, which, in turn, is determined as the difference between the revenues (the synergy effect $SE$) and the costs (presented value of additional costs of mergers and investments in a new corporation - $AC$), which is assumed by the acquiring corporation (Brealey, et. al., 2001).

In addition, why the money paid for the object of acquisition - $CASH$ was not included in formula (7) as part of the outflows in determining the enormous earning. The reason is that these funds are expenses for the acquiring corporation and their transfer within the new corporate structure. Moreover, cash for the object of acquisition can be only in the case of hostile takeovers, and in the case of swap mergers the value $CASH = 0$.

Since in the financial and economic sense more informative are not absolute values, such as $CASH, SE, AC$ and $Ps$, but their relative values, namely, cash for the object of acquisition, the synergistic effect and the presented value of the additional costs of a merger and investment in a new structure per unit value of the acquiring corporation, as well as the value indicating which part of the value of the main corporation is the value of the target corporation (Pavel and Qi, 2014). Thus, the expression for the factor function will be presented in the form:

$$F_b = \frac{1 - \frac{CASH}{Ps}}{1 + \frac{CASH}{P_b} \times \frac{Ps}{P_b} + \frac{SE}{Ps} \times \frac{Ps}{P_b}},$$  

$$F_b = \frac{1 - \frac{CASH}{Ps}}{1 + (CASH + SE) \frac{Ps}{P_b}},$$

where the $\langle r \rangle$ index means that this value is taken in relative units, that is:

$$CASH = \frac{CASH}{Ps}; \quad SE = \frac{SE}{Ps}; \quad Ps = \frac{Ps}{P_b}$$

Thus, Fig. 1. clearly shows how the stock price of an industrial corporation changes.
This change is formed using the family of parametric curves of the dependencies of the factor-function $F_b$ on the relative amount of money spent on the object of acquisition - $CASH_r$, with the parameter being the relative value of the synergistic effect. The figure is made for the relative value of the target corporation $P_s = 0.5$ and four different values of the synergistic effect: 0.0; 0.1; 0.2; 0.5.

- area «a-b» is proportional to the price of the stock, corresponding to the value of financial costs at the point «a».
- area “d-b”: $DF_b$ – value proportional to the total decrease in the share price both at the expense of funds for the object of acquisition, and due to the synergistic effect.
- area “c-b”: $DF_{se}$ – value proportional to the decrease in the share price due to the synergistic effect.
- area “d-c”: $DF_{cash}$ – value proportional to the decrease in the share price both at the expense of funds for the object of acquisition.

With an increase in cash for the object of acquisition, the fraction as a whole decreases, since $CASH$ has a negative sign in the numerator and a positive sign in the denominator. Consequently, the share price of the seller of a business is a monotonously killing function and, therefore, the exchange ratio $ER_b$ is inversely proportional to $CASH$ for corporations, and $B$ is calculated with already fixed values of equity $Ps$ and $Pb$ and synergistic effect $SE$ (Saint-Onge, Chatzkel, 2009; Srovnalíková, et. al., 2018).

In other words, the cash paid for the target corporation - $CASH$, can in a certain sense be considered as an “advance” issued by the acquiring corporation in the initial stage of the merger process, which is reflected in the calculation formulas of the $ER$ coefficient.

Theoretically, the maximum value of cash for the object of acquisition can be equal to $P_s$. In this case $ER=0$. In fact, $CASH=P_s$ means that the target corporation is fully repurchased and the issue of share swap ratios automatically falls to the ground.

The nature of the curves of the dependencies of the factor function, as well as the above, becomes clearer if we consider the ordinate line, equal in value to one (line “a-d”, Fig. 1.) for some point of the x-axis - “a”, corresponding to a certain value of funds by the target corporation. Two curves are considered, one of which corresponds to the merging of corporations with zero synergistic effect (the upper curve in Fig. 1.), and for the definiteness, as the second curve is taken the lowest with the value of $SE_r = 0.5$.

The «a-d» line consists of three parts:
The «a-b» line is equal to the value of the factor function $F_b$ at the point «a”. Proportional to this value, the exchange ratio decreases and, accordingly, the share price of the target structure of corporations for given values ias as follows: $CASH \neq 0$ and $SE \neq 0$.

As can be seen from Figure 1, the factor function decreases by $DF_b = 1 - F_b$. The figure also shows that the decrease in the share price of the target structure of corporations is due both to the synergy effect and to the money spent on the object of acquisition, that is $DF_b = DF_{cash} + DF_{se}$, where:

- “c-b” line is the decrease of the share price only due to the synergistic effect.
- “d-c” line is the decrease in the share price only due to the money spent on the object of acquisition.

Finally, the factor function can be represented in the following form:

$$F_b = 1 - DF_{cash} - DF_{se}. \quad (11)$$

Substituting this expression in (12), we obtain the formula for calculating the price of one share of the selling corporation for this option of acquisition - the most acceptable for the acquiring corporation:

$$V_s = ER_b \times (1 - DF_{CASH} - DF_{SE}) \times V_b \quad (12)$$
It is clear that the «lost» shares of the share price depending on the money spent on the object of acquisition - $LV_{\text{cash}}$ and on the synergistic effect - $LV_{\text{se}}$ can be determined by the following formulas:

\begin{align}
LV_{\text{CASH}} &= ER_k \times DF_{\text{CASH}} \times V_b, \\
LV_{\text{SE}} &= ER_k \times DF_{\text{SE}} \times V_b
\end{align}

Thus, we can see that the question of whether to accept money or not from the purchaser is not simple and clear for the selling corporation.

Before deciding on the cash for the object of acquisition and on the CASH value itself, the management of the target corporation should assess the probability of one or another outcome of the merger process, the prospects for the future corporate structure, the life expectancy and the expected future dividends (Very, and Schweiger, 2001).

As for the curves of the dependencies of the share price of the target corporation on the value of the synergistic effect $SE$, the interests of the shareholders of the target corporation and the purchaser are diametrically opposite. No matter how paradoxical it may seem, but it is more profitable for shareholders of the target corporation to get small values of the synergistic effect, since they will have large values of the factor function $F_b$. However, upon careful consideration, it becomes clear that there is no paradox here. Of course, all shareholders benefit from the high values of the synergistic effect. And the higher the value of $S_E$ is, the more successfully the combined integration structure of corporations works and the higher its value becomes. But this all will happen in the future. The synergistic effect is a parameter of the future, but it is not at all necessary that it turns out to be just that. Moreover, in case of unsuccessful process of integration of corporations, this value may even be negative, which means that the combined structure is unprofitable (IPO Watch Europe, 2018).

Although the synergistic effect is calculated at the initial stage of an integration agreement, it is purely a parameter of the future, when everyone will be shareholders of the joint corporate structure and, as members of one team, will have common goals aimed at increasing the profitability and value of the company (Waddock, et. al., 2006).

But in the initial stage of the integration process, shareholders of corporations unite, representing different "worlds", with opposite goals and interests. Thus, the managers of the selling corporation in order to increase the values of the share exchange ratios $ER_k$ seek, by hook or by crook, to underestimate the synergy effect, to direct $SE \to 0$. And it is quite natural, as indeed it is natural that the task of the managers of the acquiring corporation will be to induce arguments in favor of high values of the synergistic effect ($SE \to max$).

For the target corporation, a zero value of the synergistic effect is beneficial for this variant of calculating share exchange ratios using the “1” model.

**Model ‘2’**.

Merger at the most profitable option for the corporation. We use the rule of net present value ($NPV$) to analyze acquisitions of industrial corporations.

For the acquiring corporation, this indicator will be equal to:

\[ NPV_b = (1 - \delta) \times P_{bs} - P_b - CASH - AC \]
where:

- $P_{bs}$ – value of the equity capital of a corporation formed by the DCF model;
- $P_b$ – value of the acquiring corporation determined by the DCF model;
- $CASH$ – cash paid for the object of acquisition.
- $\delta$ – share of shareholders in the target corporation in a new corporate structure.
- $AC$ – presented value of additional costs of mergers and investments in a new corporate structure.

The maximum possible exchange ratio at which a corporation’s merger, from an economic point of view, loses all meaning for the acquiring corporation is when $NPV_b = 0$. In this case, the entire enormous earning is taken by the selling corporation (Gupta, 2012).

Just as in the previous option, it can be shown that:

$$ER_s = ER_k \times F_s$$  \hfill (16)

where:

$$F_s = \frac{1 + \frac{SE - \frac{CASH + AC}{P_s}}{P_s}}{1 - \frac{CASH + AC}{P_b}}$$  \hfill (17)

Here, all the values and designations are similar to those adopted earlier, in the first option of the assessment (model “1”), and $ER_k$ means the initial, but now the minimum value of the share exchange ratio for this option of acquisition, which can increase further depending on the synergy effect, funds paid for the object of acquisition, the presented value of additional costs of the merger and investments in a new corporate structure and equity values of both companies, determined using the DCF model (Puranam, et. al., 2006).

As in the model “1” discussed above, it is more convenient to present the factor function $F_s$ in relative units:

$$F_s = \frac{1 + \frac{SE - \frac{CASH + AC}{P_s}}{P_s}}{1 - \frac{CASH + AC}{P_b} \times \frac{P_s}{P_b}}$$  \hfill (18)

or:

$$F_s = \frac{1 + \frac{SE_r - (CASH_r + AC_r)}{P_s}}{1 + (CASH_r + AC_r)P_{sr}}$$  \hfill (19)

Similarly to the analysis carried out for option “1”, we will analyze in terms of the share price of a new corporate structure, so the area of ordinate “$a-d$” (Fig. 2.), built for a certain point on the x-axis corresponding to a certain value of expenses ($CASH_r + AC_r$). Point “b” lies on the curve $SE = 0$, point “d” with $SE = 0.5$, and point “c” corresponds to the value of the exchange coefficient $ER_s = ERk (F_s = 1)$. 
Fig. 2. Dependence of the share price of a new corporate structure of corporations on the financial expenses of the business purchaser by the merger option, most profitable for the business seller with the relative value of the target corporation $P_{sr} = 0.5$ and four values of synergistic effect $SE = 0.0, 0.1, 0.2$ and $0.5$.

Source: Designed by the authors

In Fig. 2, the positions are given in the form of a family of parametric curves, the graph of dependencies of the share price of the integration structure of corporations on the financial costs of the acquiring corporation, expressed through the dependencies of the factor function $F_s$ on the relative value of funds, the object of acquisition and the costs incurred by the acquiring corporation — $(CASH_r + AC_r)$, where the function parameter is the relative value of the synergistic effect of $SEr$. Fig. 4.2. corresponds to the relative value of the target corporation $P_{sr} = 0.5$.

- area $«a-b»$: proportional to the share price corresponding to the value of financial expenses at the point “a”.
- area “c-b”$: $DF_{CASH}$ – decrease in the share price due to the money paid for the object of acquisition.
- area “b-d”$: $IF_{SE}$ – increase in the share price due to the synergistic effect.
- area “c-d”: difference $IF_{SE} - DF_{CASH}$ determines the value of the benefits or losses of the acquiring corporation due to varying the price of shares of a new corporate structure.

We see that the share price is a monotonously decreasing function of the total value of all financial expenses of the acquiring corporation, however, in contrast to the previous option, it is a monotonically increasing function of the synergistic effect value. The result is that in this model “2”, when the entire enormous earning $EEs = SE - AC$ is taken away by the target corporation, and the corporations change roles in the corporatisation model. Now the management of the target corporation with the aim of increasing the share price and, naturally, striving to move to higher $F_s$ curves, seeks to substantiate higher values of the expected synergistic effect. ($(SE \rightarrow \text{max})$ (John, 2010). It is also beneficial for them that the estimated value of additional costs for mergers and investments in a new structure is as low as possible, and, conversely, the minimum calculated (but, of course, not real) values of the synergistic effect and the maximum estimated financial costs become beneficial to the management of the acquiring corporation. (Makedon, et. al., 2019a).

As a result, if in the option “1” that is most suitable for the acquiring corporation, the selling corporation loses, both with an increase in funds for the object of acquisition, and with an increase in the synergistic effect, then in option “2” - the most acceptable for the selling corporation, it loses only with an increase in funds for the object of acquisition and acquires with an increase in the synergistic effect.
At the same time, if the expression for determining the loss in the share price - $LV_{\text{cash}}$ at the expense of funds for the object of acquisition (13) remains unchanged, then the expression for the evaluation of acquisition - $AV_{se}$, due to the synergistic effect, have the following form:

$$AV_{se} = ER_k \times IF_{se} \times V_b.$$  \hspace{1cm} (20)

Therefore, the formula for determining the factor function will be as follows:

$$F_s = 1 - DF_{\text{cash}} + AC + IF_{se}.$$ \hspace{1cm} (21)

And the price of one share will be equal to:

$$V_s = ER_k \times (1 - DF_{\text{cash}} + AC + IF_{se}) \times V_b.$$ \hspace{1cm} (22)

Let’s determine whether there is a Model that is economically unprofitable for the acquiring corporation in real business conditions. At first glance, unreal. But on the other hand, the option of merger which is unattractive for the acquiring corporation, under certain conditions, can be quite real. First, if the target corporation is economically weak, that is, $P_s < P_b$, then all expenses ($AS$ and $CASH$) will be sensitive for a large acquiring corporation, while the actual value of the synergistic effect can be significant (Scharpf, 2018). And, secondly, the acquiring corporation can use a deliberately unprofitable and unprofitable option of acquisition, as a forced agreement in tactical terms that will become a springboard for important and necessary in the future strategic plan for investment projects.

**Model ‘3’.**

Mergers / acquisitions with equitable distribution of benefits among participants. Equitable distribution of benefits from mergers or acquisitions among international corporations occurs if:

$$\frac{NPV_s}{NPV_b} = \frac{\delta}{1 - \delta}.$$ \hspace{1cm} (23)

Substituting into this equation formulas (11) and (15) for $NPV_s$ and $NPV_b$, respectively, and formula (12) for $\delta$ and, having made the transformations, we will get:

$$ER_j = ER_k \times F_j$$ \hspace{1cm} (24)

where:

$$ER_k = \frac{N_b \times P_s}{N_s \times P_b} = \frac{P_s / N_s}{P_b / N_b};$$ \hspace{1cm} (25)

$$F_j = \frac{1 - CASH}{P_s} \times \frac{1 + CASH \times AC / P_b}{P_b}.$$ \hspace{1cm} (26)

This is a fair distribution of merger / acquisition benefits, in which the share of each participant is proportional to the effect it receives. In terms of relative units, the expression for the factor function $Fj$ will take the form:
With a careful analysis, we can see that $F_j$ and $F_b$ are determined by the same expression, only instead of the synergistic effect “SE” for the factor function $F_b$, for the function $F_j$ there is the value of additional costs for mergers and investments in a new integration structure of corporations – “АТ” (Lin, and Piesse, 2004). Therefore, the family of parametric curves $F_j$ (Figure 3) repeats the same for $F_b$.

\[
F_j = \frac{1 - \frac{\text{CASH}}{P_s}}{1 + \frac{\text{CASH}}{P_s} \times \frac{P_s}{P_b} + \frac{\text{AC}}{P_s} \times \frac{P_s}{P_b}},
\]

or:

\[
F_j = \frac{1 - \text{CASH}_r}{1 + (\text{CASH}_r + \text{AC}_r) \times P_s}.
\]

Figure 3 shows that the share price monotonously decreases depending on any costs and funds for the object of acquisition, and additional costs for mergers and investments in a new structure, which are borne by the acquiring corporation. All considerations regarding the share exchange ratio made above for model “1” can also be applied to model “2” with one exception: everywhere, instead of the synergistic effect “SE”, it is necessary to use expenditures “AC”. Thus, for the purchaser to reduce the share price of the integration structure, it is advantageous to use in the calculation formulas large values of additional costs for mergers and investments in a new structure, while the role of investment expenses becomes zero for the target corporation (Makedon, Korneyev, 2014b).
5. Discussion

In this case, the expression for determining the price of one share, the lost parts of the share price for the spent funds, the object of acquisition of $LV_{\text{cash}}$ and additional funds for mergers and investments in the new integration structure $LV_{\text{ac}}$ are similar to the expressions for the model “1” (formulas 22-24, respectively), only the value “$SE$” should be replaced by “$AC$”.

The fairness of the distribution of the benefits of acquisition is that each company receives a portion of the total income of the combined corporate structure (WE) in proportion to its contribution, namely:

- the income of the target corporation will be equal to:
  \[ EE_s = \delta \times (SE - AC), \]  
  \[ (29) \]
- and the income of the acquiring corporation will be:
  \[ EE_b = (1 - \delta) \times (SE - AC) \]
  \[ (30) \]

It can be shown that:

\[ EE_s = \frac{P_s - \text{CASH}}{P_s + P_b + AC} \times (SE - AC) \]  
\[ (31) \]

\[ EE_b = \frac{P_s + AC + \text{CASH}}{P_s + P_b + AC} \times (SE - AC) \]  
\[ (32) \]

Thus, we have clearly determined the parameters for the dependence of the share price of a new corporate structure on certain actions and starting conditions for an integration transaction for both the acquiring corporation and the target corporation with a view to fair distribution of the benefits from mergers or acquisitions.

Conclusions

The models of formation of investment security for international corporations from the implementation of mergers and acquisitions were developed. Thus, Model “1” determines a synergistic effect at the initial stage of integration, it is purely a parameter of the future, when everyone will be shareholders of the joint structure of corporations and, as members of one team, will have common goals aimed at increasing the profitability and market value of the company. The entire increase in the market value of corporate integration becomes the “property” of the acquiring corporation.

Model «2» of mergers / acquisitions at the most advantageous option for the target corporation, when the maximum possible exchange rate is formed, at which the merger of corporations from an economic point of view loses all meaning for the acquiring corporation. In this case, all the enormous earning is taken by the selling corporation.

Model «3», using which there is a fair distribution of benefits between participants in a merger / acquisition transaction. The fairness of the distribution of the benefits of acquisition is that each company receives a portion of the total income of the combined corporate structure in proportion to its contribution.

Such investment security models clearly determine the parameters of the share price of the joint corporate structure of certain actions and the starting conditions of the integration transaction for both the acquiring corporation and the target corporation.
References


Makedon, V., Drobyazko, S., Shevtsova, H., Maslosh, O., Kasatkina, M. (2019a). Providing security for the development of high-


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RISK-RETURN THROUGH FINANCIAL RATIOS AS DETERMINANTS OF STOCK PRICE: A STUDY FROM ASEAN REGION

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Abstract. The objective of this empirical research is to analyze the risk-return through financial ratios as determinants of stock price in ASEAN region. To address this purpose, business firms from Malaysia, Indonesia, Thailand and Singapore are selected with a sample of 10 firms in each state over 2012 to 2016. Multiple regression technique is applied to analyze the relationship between financial ratios and stock prices. It is observed that current ratio, quick ratio, assets growth, return on assets, return on equity, return on capital employed, and price to earning ratio are significant determinants of stock price. Although this study is a reasonable addition in existing literature of financial ratios as determinants of stock price. However, contribution of the study can be viewed through covering a gap from the context of ASEAN region, which is under researchers attentions for stock price determinants. Core limitations of the study covers limited number of sample size and five years of time duration. Besides, some ratios are missing which can be reconsidered in upcoming studies. These ratios include debt ratios, interest payment ratios, and fixed cost covered ratios as well.

Keywords: financial ratios, stock price, price to earnings, assets growth, ASEAN


JEL Classifications: G10, R53, E39

1. Introduction and Background

In financial market, investors make investment decision through available information and level of risk perception while studying the business trend (Healy & Palepu, 2001; Slovic, 1972). For this purpose, various type of analysis tools and procedures are applied. The most significant technique is to examine the business trend through financial statement analysis (Edwards, Magee, & Bassetti, 2018; Taylor & Allen, 1992; Hilkevics, Semakina, 2019).

Various sub methods under financial statements like trend analysis, fundamental analysis, technical analysis and ratio analysis are very much significant (Bisoi & Dash, 2014; Pring, 2002; Bugu & Yucheng, 2018; Castro, 2018; Austrykaitė, Paškevičius, 2018; Narkunienė, Ulbinaitė, 2018).
Decision makers and analysts in the field of finance and risk management have widely examined the business trends through financial ratios and their overall pattern over series of analysis (Bromiley, Miller, & Rau, 2001; Kamran, Chaudhry, et al., 2016; Tarasova et al., 2018; Zandi & Haseeb, 2019, Vinogradova, N.P., Popov, 2019).

Among various financial ratios, the first measure is under the title of liquidity measures which consider firms’ ability to pay its short-term liabilities and financial obligations on time (Gitman, Juchau, & Flanagan, 2015). In this regard, the role of current ratio and quick ratio is very much important. The second measure in financial ratios is under the title of activity ratio which explains the firm’s ability to actively convert its various account into cash or sales (Yada & Nakai, 1986). The idea of inventory turnover ratio, assets turnover ratio, average collection period, and average payment period are important indicator under activity ratio (Raheman & Nasr, 2007; Richards & Laughlin, 1980; Chang-Sheng, 2018; Chima & Kasim, 2018). The third ratio as per the earlier literature is known as debt ratio which considers the firm’s solvency, its portion of long term and current debts in the assets, coverage of interest expense through its operating profit, fixed payment through earning before interest and tax, dividend payment ratio. These ratios are widely used in examining the leverage pattern, and capital structure as well (Kamran, Khan, & Sharif, 2016). Business risk is measured through liquidity, activity and debt ratio. To examine the level of earnings and return in the business, various measures like return on assets, equity return, and capital employed return, gross profit margin, net profit margin and return on sales have got significant attention in present literature. The fifth measure for the financial ratios entitles as market ratios, covering the title of both risk and return factors. This ratio covers the proxies like market to book ratio, and price over earning ratio.

In addition, business organizations are working for various objectives but the most significant is to maximize the stockholder’s wealth over longer period of time (Kronman, 1980; Posner, 1985). Various measures are discussed in the literature, but market price of the equity share is found to be the most important (Adjasi, 2009; Porter & Kramer, 2019; Masood et al., 2019). It reflects the firm’s capacity to generate more return over its investment and sales, creating positive image in the market place, attracting more investors from the market, sustaining existing owners, competing in the market through innovative products and services and surviving over long run. However, the factor of sustaining long run in the market comparatively to the rivals, business organizations are working constantly in the world economy through improving financial performance. Meanwhile risk-return factors are accepted as among the significant determinant to affect the wealth of stock holders in the form of share price. In this regard, effect of financial ratios on business stock price is a significant topic to be addressed. This study has considered various financial ratios and their impact on stock price of selected firms in ASEAN region, which is not under significant attention earlier. The rest of the paper is as follows. Section two explains the literature review of the research. Section three explains the variables and their operational definition. Section four explains samples and methods. Section five provides a comprehensive discussion about empirical findings. Last section explains conclusion and future direction.

2. Review of Literature

Literature context for the association between financial ratios and their impact on stock price have provided significant evidences. For instance, (Meriç, Kamışlı, & Temizel, 2017; Garfield, 2018) have examined the impact of price to earnings ratios, dividend yield ratio as core indicator of stock price in banking sector of Turkey. Data for monthly price of banking stock and related ratios have been explored during the time of 2008 to 2017. It is found that there exists significant association between financial ratios and stock price of banking firms in Turkey. Meanwhile, very first impact of price to earning ratio is examined by (Basu, 1977) who considered 1400 business firms, listed in NYSE through regression analysis. Time period of the study was 1956 to 1971 with annual observation. It is observed that efficient market hypothesis exists between the relationship of stock price and price to earning ratio. In his study, (So & Tse, 2004; Clausen, 2018; Dar & Bhat, 2018) explores the association between stock return, price to earning ratio and dividend yield for the real estate business firms during 1991 to 2000. Through regression analysis, it is confirmed that fast growth in the stock price and slow growth in dividend are significant linked to price to earning ratio. Meanwhile, (Omran & Ragab, 2004) exam-
ined the link of financial ratios with stock price. Overall 46 Egyptian firms during 1996 to 200 is observed with annual observations.

Musallam (2018) review the association between financial ratios and 26 firms, listed in the Qatar stock market during the time of 2009 to 2015. Research designed is based on the secondary data with annual observation and application of weighted least square for the price per share of stock, earning yield ratio, and dividend yield (Hussain, Salem, Rashid, & Kamarudin, 2019). It is found that key financial ratios have their significant and positive impact on the return of stock. Besides, financial ratios like market to book, return on equity, return on assets, price to earning ratios, and net profit margin have their insignificant impact on stock return of selected firms. Practical implication of the study indicates that policy makers from the government, investors and business mangers can use the findings for strategic decision.

The study of (Pech, Noguera, & White, 2015; Trejo-Pech, White, & Noguera, 2015) provides the evidence that financial ratios are playing their major role while defining the stock market return. During the end of last decade, (Wang & Lee, 2010) explains that effect of profitability, leverage, assets turnover and solvency ratio for the stock return in shipping industry. Series of other research studies as conducted by (Beaver, 1968; Bhandari, 1988; Hoque, Kim, & Pyun, 2007; Huang, 1995; In & Kim, 2006; Khan, Gul, Rehman, Razzaq, & Kamran, 2012; Kheradyar, Ibrahim, & Nor, 2011; Lakonishok & Lev, 1987; Lam, 2002; O’Connor, 1973; Smith, Jeffrey, & Ryoo, 2002) state the fact that stock return is found to be significantly associated with the financial ratios in selected region.

In addition, earlier research studies have explored the relationship between financial ratios and market stock return while considering different nations. For instance, (Alam, Hasan, & Kadapakkam, 1999; Cascio, Young, & Morris, 1997; Cheng, Fung, & Lam, 1998; Kheradyar et al., 2011; Martani, Khairurizka, & Khairurizka, 2009; Ramkillawan, 2014). As per implication of econometric modelling, (Dajcman, 2012) used two way of fixed effect considering the ratio of earning yield with the book to market during 2002 to 2008. Another study conducted by (Chan, Hamao, & Lakonishok, 1991; Dori, 2018; EGBUNIKE & OKOYE, 2017; Elad et al, 2017) have tested the association between the fundamental ratios and stork return for the firms working in Japan. It is argued that there exists a direct relationship between stock return in Japan and key financial ratios over time. another study conducted by have examine the impact of book to market ratio and price to earning ratio for the stock market return for the firms working in Hong Kong. It is observed that both financial ratios are significant determinants of stock market return. Cheung, Chung, and Kim (1997) examines the effect of book value and earning indicators for the profitability in the similar region of Hong Kong.

In depth review of the literature reveals that ASEAN region is not under researcher’s attention for exploring the relationship between financial ratios and their impact on price of common stock for business firms. to the best of author” findings, therefore, this study is examining this association for the very first time while taking all financial ratios as core determinants of stock price (Table 1).
Table 1. Variables description

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Measurement</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Ratio</td>
<td>Current assets/current liabilities</td>
<td>(Gitman et al., 2015)</td>
</tr>
<tr>
<td>Quick Ratio</td>
<td>Current assets-inventory/current liabilities</td>
<td>(Gitman et al., 2015)</td>
</tr>
<tr>
<td>Assets turnover</td>
<td>Total sales/ total assets</td>
<td>(Gitman et al., 2015)</td>
</tr>
<tr>
<td>Assets growth</td>
<td>Annual increase (%) in assets</td>
<td>(Brigham &amp; Houston, 2012)</td>
</tr>
<tr>
<td>Average collection period</td>
<td>Account receivable/ annual sales per day</td>
<td>(Jain, 1999)</td>
</tr>
<tr>
<td>Average payment period</td>
<td>Account payable/ annual purchase per day</td>
<td>(Damodaran, 1996)</td>
</tr>
<tr>
<td>Return on assets</td>
<td>Net income after tax/total assets</td>
<td>(Gitman et al., 2015)</td>
</tr>
<tr>
<td>Return on Equity</td>
<td>Net income after tax/total common</td>
<td>(Subramanyam, 2009)</td>
</tr>
<tr>
<td>Return on capital employed</td>
<td>Net income/ total capital employed by the business</td>
<td>(Subramanyam, 2009)</td>
</tr>
<tr>
<td>Gross profit margin</td>
<td>Gross profit/sales</td>
<td>(Subramanyam, 2009)</td>
</tr>
<tr>
<td>Earnings per share</td>
<td>Net income after tax/total common shares</td>
<td>(Nissim &amp; Penman, 2003)</td>
</tr>
<tr>
<td>Price/earnings Ratio</td>
<td>Market price per share of common stock/ net income after tax</td>
<td>(Prasetyorini &amp; fitri, 2013)</td>
</tr>
<tr>
<td>Market price per share</td>
<td>Market price per share of common stock</td>
<td>(Adam, Mareet, &amp; Nicoli, 2016; Arthur, 2018; Fama, 1965)</td>
</tr>
</tbody>
</table>

3. Methods and Sample

This study has applied quantitative technique to explore the relationship between financial ratios and stock prices in ASEAN region. For this purpose, secondary data is collected from various sources including online data portals, annual reports and company’s website. Data is collected for the time period of five years (2012-2016) with annual observations. A sample of 10 business firms is selected from each of the selected states in ASEAN. After the collection of data, regression technique is applied to examine the causal effect of financial ratios on stock market price of selected firms. Robust regression provides more reliable findings for statistical inference and further decision making.

4. Discussion of Results

Table 2 presents regression results for selected firms working in the region of Malaysia. Model 1 reflects the effect of both risk and return overall ratios. It is found that effect of quick ratio on stock price is 1.201 with standard error of .634. It means that stock price of the company will be increased with the increasing value of current ratio in the business. The effect of assets turnover on stock price is significantly positive at 1 percent with the coefficient of 4.109. While from the return factors like return on capital employed, effect on stock price is .656. Through model 2, effect of liquidity and assets turnover ratio is observed through market price. Both quick ratio and assets turnover have their significantly positive influence on stock price with the regression coefficient of .815 and 9.195. Assets growth is significantly and positive affecting stock price under model three with the standard error of .361. Under model four, none of the variable is found to be significantly affecting the stock price of the selected companies. Under model five, effect of both risk-return effect through price over earnings ratio is negatively insignificant for stock price. Model 6 indicates the fact that quick ratio and assets turnover have their significantly positive influence on stock price in the market. Besides, when the presence of current ratios, assets growth, and turnover ratios, effect of price to earnings ratio on stock price is significantly positive under full sample for selected firms in Malaysia. All regression models present good explained variation of above .80 with the highest variation under model 1, followed by model 3 respectively.
Table 2. Financial ratios as determinants of stock price in Malaysia

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CURRENT RATIO</td>
<td>-14.63</td>
<td>2.091</td>
<td>2.406</td>
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<td></td>
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</tr>
<tr>
<td></td>
<td>(21.12)</td>
<td>(1.865)</td>
<td>(1.781)</td>
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<tr>
<td>QUICK RATIO</td>
<td>1.201*</td>
<td>0.815*</td>
<td>0.827*</td>
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<tr>
<td></td>
<td>(0.634)</td>
<td>(0.442)</td>
<td>(0.428)</td>
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<tr>
<td>ASSETS TURNOVER RATIO</td>
<td>4.109***</td>
<td>9.195***</td>
<td>9.222***</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>(1.450)</td>
<td>(0.581)</td>
<td>(0.591)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASSETS GROWTH</td>
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<td>1.408***</td>
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<tr>
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<td>(0.219)</td>
<td>(0.361)</td>
<td></td>
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<td></td>
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<td>AVERAGE COLLECTION PERIOD</td>
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<td>-0.0318</td>
<td>-0.0161</td>
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</tr>
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<td></td>
<td>(0.0102)</td>
<td>(0.0317)</td>
<td>(0.0172)</td>
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<td>AVERAGE PAYMENT PERIOD</td>
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<td>0.00943</td>
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<tr>
<td></td>
<td>(0.00890)</td>
<td>(0.0232)</td>
<td>(0.0194)</td>
<td></td>
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<td>RETURN ON ASSETS</td>
<td>-0.140</td>
<td>0.858</td>
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<tr>
<td></td>
<td>(0.660)</td>
<td>(0.577)</td>
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</tr>
<tr>
<td>RETURN ON EQUITY</td>
<td>-0.672</td>
<td>-2.540</td>
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<td></td>
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<tr>
<td></td>
<td>(1.596)</td>
<td>(2.211)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RETURN ON CAPITAL EMPLOYED</td>
<td>-0.656*</td>
<td>0.108</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.364)</td>
<td>(0.350)</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>GROSS PROFIT MARGIN</td>
<td>-0.963</td>
<td>-0.103</td>
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<tr>
<td></td>
<td>(0.869)</td>
<td>(0.538)</td>
<td></td>
<td></td>
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<tr>
<td>EARNING PER SHARE</td>
<td>52.05</td>
<td>1.433</td>
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<tr>
<td></td>
<td>(86.94)</td>
<td>(4.350)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRICE/EARNING RATIO</td>
<td>-1.977</td>
<td>-2.928</td>
<td>2.930**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(10.80)</td>
<td>(5.943)</td>
<td>(1.208)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>10.75**</td>
<td>-0.0751</td>
<td>2.870</td>
<td>0.980</td>
<td>4.708**</td>
<td>-1.059</td>
</tr>
<tr>
<td></td>
<td>(4.921)</td>
<td>(0.311)</td>
<td>(1.977)</td>
<td>(4.474)</td>
<td>(2.282)</td>
<td>(1.349)</td>
</tr>
<tr>
<td>Observations</td>
<td>48</td>
<td>45</td>
<td>49</td>
<td>43</td>
<td>46</td>
<td>43</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.92</td>
<td>0.864</td>
<td>0.901</td>
<td>0.452</td>
<td>0.624</td>
<td>0.634</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 3 presents the effect of various financial ratios on stock price of Indonesian firms, it is found that with the presence of all ratio factors, effect on stock price is significant through return on equity, with the coefficient of 2.077. While model 2 found to be insignificant with the presence of .211 explained variation through constant factor. Model three reflects the fact that assets growth is significantly and negatively affecting the stock price with the coefficient of -1.336 and standard error of .298. Model four indicates that return on assets has its significant and positive influence on stock price. While gross profit margin shows an effect of .455 with standard error of .129. This effect explains that higher gross profit margin creating a positive image in the market place, which in return increase the price of equity shares. Model 5 presents the effect of risk return factor through price over earnings ratio. The effect through price over earning is 2.094, significant at 10 percent. Model 6 shows that average collection period is positively and significantly affecting the stock price for sample firms in Indonesia. Meanwhile through price over earnings ratio, significantly positive influence is observed.

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Table 3. Financial ratios as determinants of stock price in Indonesia

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CURRENT RATIO</td>
<td>-4.644</td>
<td>-0.372</td>
<td>0.672</td>
<td>(4.052)</td>
<td>(0.423)</td>
<td>(0.703)</td>
</tr>
<tr>
<td>QUICK RATIO</td>
<td>-2.110</td>
<td>0.623</td>
<td>-0.560</td>
<td>(0.765)</td>
<td>(0.551)</td>
<td>(0.684)</td>
</tr>
<tr>
<td>ASSETS TURNOVER RATIO</td>
<td>0.292</td>
<td>0.711</td>
<td>0.927</td>
<td>(0.470)</td>
<td>(0.746)</td>
<td>(0.692)</td>
</tr>
<tr>
<td>ASSETS GROWTH</td>
<td>-0.117</td>
<td>-1.336***</td>
<td>(0.408)</td>
<td>(0.298)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AVERAGE COLLECTION PERIOD</td>
<td>0.0190</td>
<td>0.00536</td>
<td>0.0366*</td>
<td>(0.00822)</td>
<td>(0.00826)</td>
<td>(0.0186)</td>
</tr>
<tr>
<td>AVERAGE PAYMENT PERIOD</td>
<td>0.00552</td>
<td>-0.00733</td>
<td>-0.00834</td>
<td>(0.00272)</td>
<td>(0.00762)</td>
<td>(0.0110)</td>
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<tr>
<td>RETURN ON ASSETS</td>
<td>-0.0884</td>
<td>0.178***</td>
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<td>(0.0430)</td>
<td>(0.0412)</td>
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<tr>
<td>RETURN ON EQUITY</td>
<td>2.077*</td>
<td>0.0549</td>
<td></td>
<td>(0.588)</td>
<td>(0.242)</td>
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</tr>
<tr>
<td>RETURN ON CAPITAL EMPLOYED</td>
<td>0.0591</td>
<td>-0.0224</td>
<td></td>
<td>(0.101)</td>
<td>(0.0213)</td>
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<tr>
<td>GROSS PROFIT MARGIN</td>
<td>0.594</td>
<td>0.455***</td>
<td></td>
<td>(0.265)</td>
<td>(0.129)</td>
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</tr>
<tr>
<td>EARNING PER SHARE</td>
<td>36.27</td>
<td>3.399</td>
<td></td>
<td>(30.17)</td>
<td>(2.119)</td>
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</tr>
<tr>
<td>PRICE/EARNIG RATIO</td>
<td>-2.489</td>
<td></td>
<td>2.094*</td>
<td>2.582*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-3.946</td>
<td>1.045***</td>
<td>1.777***</td>
<td>-2.287*</td>
<td>0.856***</td>
<td>-0.455</td>
</tr>
<tr>
<td>Observations</td>
<td>48</td>
<td>46</td>
<td>48</td>
<td>43</td>
<td>46</td>
<td>48</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.183</td>
<td>0.211</td>
<td>0.702</td>
<td>0.886</td>
<td>0.259</td>
<td>0.487</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

For the determination of stock price, business firms of Thailand, table 3 indicates the key findings. Through all factors of key financial ratios, effect of return on assets is significantly negative with the coefficient of -.488. While all other ratios are found to be insignificant determinant of stock price. Model two considers the liquidity ratios and assets growth. It is observed that only the effect of assets turnover is significant and positive. For activity ratios, average payment period is found to be negatively affecting the stock price. While return on assets and return on equity have their significant and positive influence on stock price. It means that more financial performance and earning through assets and equity is beneficial for the stockholders through value maximization in the form of increasing stock price. Model six under table 3 shows the fact that all the ratios except average collection period has its significant and negative influence on stock price of business firms, working in the region of Thailand. Model 1 in table 4 shows maximum explained variation, followed by model four and model six.
Table 4. Financial ratios as determinants of stock price in Thailand

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CURRENT RATIO</td>
<td>0.864</td>
<td>-0.642</td>
<td>-0.717</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>(3.099)</td>
<td>(0.723)</td>
<td>(0.675)</td>
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</tr>
<tr>
<td>QUICK RATIO</td>
<td>-3.750</td>
<td>1.702</td>
<td>-4.459</td>
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</tr>
<tr>
<td></td>
<td>(3.989)</td>
<td>(2.650)</td>
<td>(3.127)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASSETS TURNOVER RATIO</td>
<td>-0.270</td>
<td>0.896**</td>
<td>0.0521</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>(0.519)</td>
<td>(0.085)</td>
<td>(0.187)</td>
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<tr>
<td>ASSETS GROWTH</td>
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<tr>
<td></td>
<td>(0.256)</td>
<td>(0.285)</td>
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<tr>
<td>AVERAGE COLLECTION PERIOD</td>
<td>-0.00130</td>
<td>-0.00308</td>
<td>-0.0129</td>
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<tr>
<td></td>
<td>(0.0211)</td>
<td>(0.0133)</td>
<td>(0.0128)</td>
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<tr>
<td>AVERAGE PAYMENT PERIOD</td>
<td>-0.00197</td>
<td>0.000512</td>
<td>-0.170***</td>
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<tr>
<td></td>
<td>(0.00748)</td>
<td>(0.00758)</td>
<td>(0.00659)</td>
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<td>RETURN ON ASSETS</td>
<td>-0.488*</td>
<td>0.460**</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>(0.250)</td>
<td>(0.077)</td>
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<tr>
<td>RETURN ON EQUITY</td>
<td>2.177</td>
<td>0.724***</td>
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<tr>
<td></td>
<td>(5.469)</td>
<td>(.047)</td>
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<tr>
<td>RETURN ON CAPITAL EMPLOYED</td>
<td>-0.0996</td>
<td>-0.0578</td>
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<tr>
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<td>(0.0422)</td>
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<tr>
<td>GROSS PROFIT MARGIN</td>
<td>0.207</td>
<td>0.319</td>
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<tr>
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<td>(0.324)</td>
<td>(0.243)</td>
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<tr>
<td>EARNING PER SHARE</td>
<td>-4.242</td>
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<td></td>
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<tr>
<td></td>
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<td>(1.923)</td>
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</tr>
<tr>
<td>PRICE/EARNIG RATIO</td>
<td>2.069</td>
<td>1.611***</td>
<td>2.867***</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>(1.639)</td>
<td>(0.455)</td>
<td>(0.928)</td>
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<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-0.178</td>
<td>1.106***</td>
<td>1.212**</td>
<td>-1.119</td>
<td>0.875***</td>
<td>1.564***</td>
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<tr>
<td></td>
<td>(3.020)</td>
<td>(0.166)</td>
<td>(0.423)</td>
<td>(1.947)</td>
<td>(0.128)</td>
<td>(0.514)</td>
</tr>
<tr>
<td>Observations</td>
<td>48</td>
<td>45</td>
<td>46</td>
<td>49</td>
<td>47</td>
<td>48</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.776</td>
<td>0.168</td>
<td>0.026</td>
<td>0.621</td>
<td>0.328</td>
<td>0.523</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

For the business firms working in Singapore, stock price determinant through financial ratios are presented under table 5. Model 1 shows that current ratio indicates a significant and positive influence of 1.847 and standard error .0315. While effect of assets turnover is .187 with the error .093, reflecting a significant influence on stock price. More collection period means that business is following the policy of extending the time for cash collection from its customers. Effect of average collection period is .130 indicates significant and positive impact on stock price. Return on equity also indicates a positive influence on the stock price of business firms in Singapore. While the factor of assets growth is found to be negatively affecting the stock price, means that higher growth of assets is not beneficial for stock price. Meanwhile, factor of earning per share also shows positive effect on stock price in Singapore. Under model 6, it is observed that more delayed in the payment to the creditor is negatively affecting the stock price with the coefficient of -.025. It means that delaying the payment will create a negative image for the firms in the market, hence negative impact on shareholders wealth.
Table 5. Financial ratios as determinants of stock price in Singapore

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
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<tr>
<td>CURRENT RATIO</td>
<td>1.847***</td>
<td>-0.503</td>
<td>-0.821</td>
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</tr>
<tr>
<td></td>
<td>(.0315)</td>
<td>(0.582)</td>
<td>(0.546)</td>
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<tr>
<td>QUICK RATIO</td>
<td>-2.927</td>
<td>0.494</td>
<td>0.587</td>
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<tr>
<td></td>
<td>(3.711)</td>
<td>(0.742)</td>
<td>(2.561)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASSETS TURNOVER RATIO</td>
<td>0.187**</td>
<td>0.168</td>
<td>0.0556</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.093)</td>
<td>(0.0998)</td>
<td>(0.106)</td>
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<tr>
<td>ASSETS GROWTH</td>
<td>-0.0882</td>
<td>-0.331***</td>
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<tr>
<td></td>
<td>(0.415)</td>
<td>(0.0875)</td>
<td></td>
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<tr>
<td>AVERAGE COLLECTION PERIOD</td>
<td>0.130***</td>
<td>0.0172</td>
<td>0.0165</td>
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<tr>
<td></td>
<td>(0.0110)</td>
<td>(0.0113)</td>
<td>(0.0146)</td>
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<tr>
<td>AVERAGE PAYMENT PERIOD</td>
<td>-0.0115</td>
<td>-0.00640</td>
<td>-0.0250**</td>
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<tr>
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<td>(0.0154)</td>
<td>(0.00669)</td>
<td>(0.0106)</td>
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</tr>
<tr>
<td>RETURN ON ASSETS</td>
<td>-0.140</td>
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<td>0.144</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>(0.314)</td>
<td></td>
<td>(0.135)</td>
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</tr>
<tr>
<td>RETURN ON EQUITY</td>
<td>0.203***</td>
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<td>0.109</td>
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<tr>
<td></td>
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<td></td>
<td>(1.192)</td>
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<td></td>
<td></td>
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<tr>
<td>RETURN ON CAPITAL EMPLOYED</td>
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<td>0.0522</td>
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<tr>
<td></td>
<td>(0.107)</td>
<td></td>
<td>(0.0534)</td>
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<tr>
<td>GROSS PROFIT MARGIN</td>
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<td>0.183</td>
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<tr>
<td></td>
<td>(0.569)</td>
<td></td>
<td>(0.235)</td>
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</tr>
<tr>
<td>EARNING PER SHARE</td>
<td>9.638</td>
<td></td>
<td>.408***</td>
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</tr>
<tr>
<td></td>
<td>(11.01)</td>
<td></td>
<td>(.0162)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRICE/EARNIG RATIO</td>
<td>0.343</td>
<td></td>
<td>0.111</td>
<td>0.0722</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.531)</td>
<td></td>
<td>(0.111)</td>
<td>(0.423)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.867</td>
<td>1.187***</td>
<td>1.063***</td>
<td>-0.100</td>
<td>1.155***</td>
<td>1.778***</td>
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<tr>
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<td>(5.173)</td>
<td>(0.124)</td>
<td>(0.299)</td>
<td>(1.883)</td>
<td>(1.013)</td>
<td>(0.621)</td>
</tr>
<tr>
<td>Observations</td>
<td>46</td>
<td>49</td>
<td>47</td>
<td>49</td>
<td>48</td>
<td>47</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.690</td>
<td>0.098</td>
<td>0.460</td>
<td>0.571</td>
<td>0.022</td>
<td>0.356</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

5. Conclusion

This study has examined the effect of financial ratios as determinants of stock price. To achieve this objective, business firms from four ASEAN region; Malaysia, Indonesia, Thailand, and Singapore are selected. Sample firms consist of 10 business organizations from each state over 2012-2016. Multiple regression approach is applied while data for financial ratios is collected from companies’ annual reports and online data sources. It is observed that for business firms working in Malaysia, key determinants for the stock price are assets turnover, assets growth, quick ratio, return on capital employed, and price to earnings ratios are core determinants of stock price over sample period. For Indonesian firms, growth is found to be significant determinant among return on assets, average collection period, gross profit margin, and price to earnings ratio for stock price. For the firms working in Thailand, key determinants of stock price are assets turnover, return on assets, and return on equity, average payment period and price to earnings ratio. For the firms in Singapore, key determinants for the stock price are current ratio, assets turnover ratio, average collection period, and return on equity, assets growth and return on assets. These findings are providing a significant documentary evidence to the investors, financial analysts, and other strategic decision makers. It is suggested that while taking any type of investment
decision in these regions, association between financial ratios and stock price should be analyzed, examined and reviewed. Meanwhile, some financial ratios and their effect on stock price is very much beneficial which can be viewed as present and future document for analyzing the firm performance through selected measures. Besides, effect of some indicators is found to be significantly negative, providing the evidence that business managers should focus on these ratios. For example, assets growth up to a reasonable level is useful for the business, but too much investment can also negatively affect the stock price of business firms, which is an alarming issue. Although this study is a reasonable addition in existing literature of financial ratios as determinants of stock price. However, contribution of the study can be viewed through covering a gap from the context of ASEAN region, which is under reserachers attentions for stock price determinants. Core limitations of the study covers limited number of sample size and five years of time duration. Besides, some ratios are missing which can be reconsidered in upcoming studies. These ratios include debt ratios, interest payment ratios, and fixed cost covered ratios as well.

References


Arthur, W. B. (2018). Asset pricing under endogenous expectations in an artificial stock market The economy as an evolving complex system II (pp. 31-60): CRC Press.


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PROCESS FACTORS OF SYSTEM SECURITY OF TRADING ENTERPRISES

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Abstract. The scientific paper is devoted to the use of process factors of the functioning of trading enterprises in order to ensure their system security. The paper proposes a managerial algorithm for introducing the practice of standardization and certification in ensuring the safety of trade enterprises. It also proposes to introduce a process approach in the field of quality management and a process-logistic approach, which assesses the quality of the stages of the implementation of the trading processes in the enterprise. The paper proposes the calculation criteria and evaluation models.

Keywords: trading enterprise; system security; standardization and certification; quality management system; process approach; assessment models; market strategy

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JEL Classifications: M 29; O 20

1. Introduction

One of the most significant events of the twentieth century is the service revolution, which is reflected in the expansion and substantial increase in the volume of the sales process, resulting in a qualitative change in the factors of economic development, sources of competitiveness of business entities and the structure of the aggregate income of the national economy, and in the direct participants in the sales process. Qualitative transformation of the trading process, strengthening its role in ensuring progressive macroeconomic dynamics and the spread of network forms of interaction between participants in trading activities led to the replacement of autonomous trading operators and open markets with international and national retailers, systematization of communications involving trade entities that affect the level and quality of the population life.

2. Literature Survey

A number of authors paid considerable attention to the management of trading enterprises (Colombelli, Quatraro, 2018; Douglas, et. al., 2016; Northouse, 2012; Tasnium, & Singh, 2016; Mayorova et al., 2018) and issues of system security of business entities (Anthony, & Govindarajan, 2000; Ravenswood, 2011; Xiang, et. al., 2018; Zemguliene, Valukonis, 2018; Masood et al., 2019; Davidavičienė et al., 2019).
On the basis of these provisions, the studies on improving the efficiency of management of trading enterprises and the formation of a stable trend for the general security of their existence become relevant.

3. Methods

The purpose of this study is to provide scientific substantiation of the theoretical foundations and methodological approaches to improving the efficiency of trading enterprises and developing practical recommendations on the formation of their management system based on certification, quality management and compliance with trade standards.

4. Results

The instruments for ensuring such an important aspect of commercial activity as the quality of goods are standardization and certification. The procedure for carrying out standardization and certification establishes the following sequence of actions that make up the cumulative certification procedure.

1. Apply for certification. A trading company sends an application to the relevant certification body that examines the application within the established procedure for the certification of homogeneous products within a period of one month (on average one month) and informs the applicant of the decision, which, among the various information required by the applicant, indicates which authorities and test laboratories may select the applicant.

2. Sampling, identification of samples and their testing. Samples for testing are selected, as a rule, by a testing laboratory or other organization on its behalf. In some cases, this is done by the certification body. Samples that have been tested are stored for the period stipulated by the rules of the certification system for specific products. Test reports are submitted to the applicant by the certification organization, their storage corresponds to the validity period of the certificate.

3. Assessment of trading activities. Depending on the certification scheme chosen, an analysis of trading activity or a quality management system certification is carried out. The assessment method is indicated in the product conformity certificate.

4. Issuance of certificate of conformity. Test reports, assessment results of trading activities, other documents on product conformity, received by the certification body, are analyzed for a final understanding of product conformity with specified requirements (Abrhám, Lžicar, 2018; Akhmetova, Suleimenova, 2018).

5. Use of a mark of conformity. A trading company acquires the right to mark certified products with a mark of conformity by obtaining a license from the certification body. As a rule, each system has its own sign.

6. Inspection control over certified products is carried out if it is provided for by the certification scheme during the entire validity period of the certificate and license to use the mark of conformity (at least once a year). Form of control - periodic and unscheduled inspections with the testing of samples to prove that the presented products continue to meet the requirements, confirmed by certification.

The actions that are carried out by experts of the relevant certification body within these three components of the scheme are presented in table 1.
Table 1. Schemes of standardization and certification in ensuring the security of trading enterprises

<table>
<thead>
<tr>
<th>Scheme number</th>
<th>Assessment of the provision of the trading process</th>
<th>Verification of the trading process</th>
<th>Inspection control of certification of the trading process</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Assessment of the quality of the performer of the trading process</td>
<td>Verification of the trading process result</td>
<td>Quality control of the performer and the trading process</td>
</tr>
<tr>
<td>2</td>
<td>Assessment of the process of performing work, ensuring the trading process</td>
<td>Verification of the trading process result</td>
<td>Process control of ensuring the trading process</td>
</tr>
<tr>
<td>3</td>
<td>Analysis of trading activities</td>
<td>Verification of the trading process result</td>
<td>Trade analysis</td>
</tr>
<tr>
<td>4</td>
<td>Assessment of the trading enterprise</td>
<td>Verification of the trading process result</td>
<td>Compliance Control</td>
</tr>
<tr>
<td>5</td>
<td>Quality System Assessment</td>
<td>Verification of the trading process result</td>
<td>Quality control system</td>
</tr>
<tr>
<td>6</td>
<td>Control of permission documents</td>
<td>Consideration of the declaration of compliance with the documents that are attached</td>
<td>Quality control system</td>
</tr>
<tr>
<td>7</td>
<td>Quality System Assessment</td>
<td>Consideration of the declaration of compliance with the documents that are attached</td>
<td>Quality control system</td>
</tr>
</tbody>
</table>

Source: Bates, 2017

For certification of trading activities, as a rule, the following schemes are used: certification of the enterprise as a whole and the following inspection control; certification of the quality of service system and the next inspection control over their work (Drobyazko S., 2017; Drobyazko S., etc., 2019).

All indicators allowing to assess the effectiveness of the activities of a trading enterprise can be divided into three groups: process indicators, product indicators, customer satisfaction indicators.

The indicators of the process include the following groups of indicators (Tvaronavičienė, 2018):
- temporary indicators (duration of operation, performance, speed of completion of tasks);
- costs of scrap products (number of overdue products, number of returns, rejection in the pre-sales period, compensation payments to the consumer);
- financial and material expenses;
- training and advanced training costs;
- indicators of resource use per unit of output.

The indicators of a product (trading process) include the following groups of indicators:
- indicators that assess the level of product safety (trading process);
- indicators that assess the environmental friendliness of product (trading process);
- indicators that characterize product reliability (warranty period, number of defects, deviations from the declared level of quality, acceptable level of quality);
- functional indicators (number of product functions, range of product (trading process), comparison with analogues).

The methodology developed by us is based on the process and logistic approach, which is characterized by a set of indicators and a dynamic assessment of the effectiveness of the retail trade process. The process and logistic approach is based on an assessment of relative economic indicators, which make it possible to get an objective assessment for each trading process and an integral one throughout the trading enterprise. The process and logistic approach determines the use of a quality management system (QMS) (Korauš, et. al., 2019).

The implementation of quality management system instruments allows you to get a detailed assessment of the need to optimize the trading processes. Therefore, it is very important to analyze the trading process management system in order to obtain a decision on the need to implement a QMS and the effectiveness of its application. There are many approaches to assessing the effectiveness of the trading process system after the implementation of the QMS, which can be classified based on the indicators we have proposed (Table 2).
### Table 2. Classification of methodological approaches to assessment of the quality management system of a trading enterprise

<table>
<thead>
<tr>
<th>Description of the methodological approach</th>
<th>Description of the system of indicators and the procedure of their application</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Assessment using qualitative indicators</td>
<td>The efficiency and effectiveness of enterprise management is determined based on the application of a scale of development levels from 0 to 5. The level is determined based on the applied management technologies, for which process characteristics are developed.</td>
</tr>
</tbody>
</table>
| 2. Assessment using economic indicators that characterize the effectiveness of the implementation of QMS in a trading enterprise | The authors propose to assess the effectiveness and efficiency of processes using the following indicators:  
– degree of customer satisfaction;  
– dynamics of growth in customer satisfaction;  
– efficiency of the process (unit);  
– level of quality \( Q=Cs=Ki*(V/C) \),  
where \( Q \) - product quality; \( Cs \) - customer satisfaction; \( Ki \) - enterprise image ratio; \( V \) - value for the customer; \( C \) - cost to customer.  
Assessment of efficiency of enterprises and retail trade based on the use of a generalized indicator of resource returns. |
| 3. Cost method of assessing the QMS in accordance with the cost of implementation of the final indicators | The economic effect is determined using the growth rate of a certain predetermined indicator for the year, and economic efficiency is calculated by comparing the growth rate of the indicator with the costs that have been incurred for a certain period of implementation and operation of the QMS. |
| 4. Combined method. Assessment of the level of maturity of the QMS with the calculation of the final economic indicators | The final index is determined based on customer satisfaction and economic performance of the enterprise. |
| 5. Using expert methods | The effectiveness of the QMS is evaluated by four blocks of indicators: cost, natural, appearance and reputation, and indicators of corporate culture. The experts assess the change in indicators in each block, calculate the total contribution of all blocks of indicators in assessing the effectiveness of implementing the QMS.  
 a) An assessment of the effectiveness of the quality costs is carried out by comparing the elements of costs, analyzing the proportion of elements in the overall quality costs structure, comparison with other indicators of the organization.  
 b) The value of the effectiveness of the functioning of a commercial enterprise is determined by the cumulative influence of individual components of the types of effectiveness. |

Source: Copeland, 2001; Haque, et. al., 2019

In order to assess the effectiveness of the management of trading processes, we traditionally distinguish specific absolute indicators or characteristics that most fully reflect or describe the efficiency of trading processes of trade enterprises through the prism of three main indicators: productivity, costs, quality.

For trading enterprises, we identified three groups of consolidated trading processes: 1. purchase, 2. transportation and storage, 3. sale. In order to assess the effectiveness of each group, we use its own group of relevant efficiency indicators. An assessment of the effectiveness of the implementation of the quality management system instruments taking into account the requirements of the ISO 9001 standard provides information on the performance of the trading process system (Hasanudin, et. al., 2019). For trading enterprises, one can distinguish the common components of these categories of expenses. They are presented in Table 3.
Table 3. Cost components of standardization and functioning of the quality management system for trading enterprises

<table>
<thead>
<tr>
<th>Cost category for quality management systems</th>
<th>Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs for quality planning</td>
<td>Costs for consultants; Salary of the quality manager (if any); Costs for acquiring regulatory documents; Part of salary of the top management of the organization (CEO and his deputies); Costs for the implementation of management decisions related to the achievement of the goals of the system.</td>
</tr>
<tr>
<td>Costs for quality management</td>
<td>Part of salary of managers of trading processes; Costs of bonuses related to the implementation of goals in the field of quality.</td>
</tr>
<tr>
<td>Costs for quality assurance</td>
<td>Costs for additional equipment for monitoring and measurement required to meet the requirements of internal regulatory documents; Additional software costs; Audit costs of management system of all stores of a trading enterprise.</td>
</tr>
<tr>
<td>Costs for quality improvement</td>
<td>Costs for the implementation of management decisions related to the implementation of corrective and caution actions.</td>
</tr>
</tbody>
</table>

Source: Ho, & Pollack, 2014

The development of trading enterprises with the use of innovative technologies has led to the development of a methodology for managing the efficiency of the trading process, consisting of a set of economic, managerial, social aggregates for optimizing resources, an author’s approach to implementation of a quality management system, assessment of the effectiveness of the trading process and development (Delas, et. al., 2015). The methodical approach proposed in this study for assessment of the performance management of trading processes is presented in Fig. 1.

![Fig. 1. Methodical approach to a complex assessment of the effectiveness of the trading process based on a systematic approach](source: Designed by the authors)

The main aim of this approach is to improve the management system of a trading enterprise. At the first stage, objectives in the field of quality by processes are formed and an appropriate assessment and analysis are carried out. Within this algorithm, a matrix of effectiveness and efficiency of processes is formed, appropriate management decisions are developed. Next, the implementation process, controlling and monitoring, as well as the development of actions for adjustment are carried out. It is important to note that the main aim of this methodology is to provide conditions for increasing the efficiency of the trading process and developing practical recommendations on how to form efficiency (Bengtsson, 2001).
The conducted study of theoretical and methodological developments allowed to formulate and test the methodology for assessing the effectiveness of the trading process on the basis of a systematic approach. The author found that in managing the efficiency of the enterprise’s trading process, its assessment is an important application of the process approach, which is the most effective way of organizing and managing in order to create value for the trading process for consumers and owners.

The main distinctive feature of this methodology from the existing ones is the use of quantitative relative indicators, which allow an objective assessment of the effectiveness. In addition, the assessment is based on a system of criteria for trading processes, so you can see the strengths and weaknesses of a particular process and develop appropriate recommendations. Dynamic evaluation of the effectiveness of the trading process with the proposed methodology allows us to determine the picture of the development of a trading enterprise in comparison with its competitors.

The proposed methodology for the process and logistic approach of the assessment includes the first block of the following steps:
1. selection of trading processes in the activities of the organization and their description.
2. development of a system of indicators to measure the effectiveness of each business process.
3. assessment of trading processes and the development of measures to adjust the management system.

Let’s consider a possible system of indicators based on the process-logistic approach to ensuring the security of economic activity. In the course of the study, a methodology was developed for assessment of the effectiveness of trading enterprises using a process and logistic approach and taking into account customer preferences.

Taking into account the fact that in the studies devoted to evaluating the effectiveness of a trading enterprise on the basis of a process and logistic approach, recommendations for improving trading processes are more presented, we will single out specific financial indicators characterizing, in our opinion, the efficiency of most trading processes.

The proposed methodology is based on a comparative assessment of the significant stages of the implementation of trading processes. Let’s consider the indicators included in the system (according to (Kislingerová, 2007; Ehrenberger, et. al., 2015).

1. Product mix width – is the number of product groups of goods, characterized by a coefficient of width ($K_w$):

$$K_w = \frac{G_f}{G_n}$$  

(1)

where $G_f$ – number of product groups of goods at the time of determination, units; $G_n$ – total number of product groups of goods, units.

2. Completeness of the product assortment is the ratio of the actual availability of types of products to the existing assortment list, effective demand.

Completeness of the product assortment is expressed through the coefficient of completeness of the product assortment $K_n$, which is determined by the formula:

$$K_n = \frac{V_f}{V_n}$$  

(2)

where $V_f$ – actual number of types of products at the time of inspection (verification), units; $V_n$ – number of types provided by the assortment list, supply agreement, standards, etc., units.
3. Depth of the assortment is the number of types of products for each item. The coefficient of the depth of the assortment \( K_d \) is calculated by the formula:

\[
K_d = \frac{R_f}{R_{fn}}
\]  

where \( R_f \) – actual number of types of products at the time of inspection, units; 
\( R_{fn} \) – number of types provided by the assortment list, supply agreement, price-list, etc.

4. Coefficient of novelty of the product assortment is the ratio of the number of new products to the total number of items of products (or current width \( W_n \)):

\[
W_n = \frac{N}{S_d}
\]

where \( N \) – number of new products; 
\( S_d \) – total number of types, varieties and names of products of the same homogeneous groups.

5. Rationality of the assortment is described by the coefficient of rationality \( K_r \), which is determined as the weighted average of the indicator of rationality, taking into account the values of indicators of width, completeness, sustainability and novelty, taking into account the coefficients of significance of each indicator \( (V_w, V_n, V_d, V_n) \). The coefficients of significance are determined by an expert, reflecting the proportion of each indicator in customer preferences, affecting the sale of goods. The coefficients of significance have values from 0 to 1.

\[
K_r = \frac{K_w \times V_w + K_n \times V_n + K_d \times V_d + W_n \times V_n}{4}
\]

6. Coefficient of uniformity of input of products is the ratio of products, which arrived in time according to plan, to the total amount of input of products:

\[
K_{mid} = \frac{AV_p}{AV_s}
\]

where \( AV_p \) – products, which arrived in time according to plan; 
\( AV_s \) – total amount of input of products.

7. The coefficient of change in logistics costs per unit of turnover is the ratio of the change in the amount of logistics costs for turnover:

\[
K_{ch} = \frac{(CH_t - CH_o)}{T_o}
\]

In continuation of these studies, we can provide a list of the main and defining indicators that determine the effectiveness of trading processes at a trading enterprise (Table 4).
Table 4. Indicators that determine the effectiveness of trading processes at a trading enterprise

<table>
<thead>
<tr>
<th>Name of the trading process</th>
<th>Operations</th>
<th>Indicators for assessing the level of implementation of trading processes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procurement, supply management of products that are sold, pre-sales service</td>
<td>management of procurement activities</td>
<td>Coefficient of novelty of the product assortment</td>
</tr>
<tr>
<td></td>
<td>assortment policy</td>
<td>Product mix width</td>
</tr>
<tr>
<td></td>
<td>market and supplier effectiveness analysis</td>
<td>Coefficient of completeness of the product assortment</td>
</tr>
<tr>
<td></td>
<td>order management</td>
<td>Coefficient of rationality, level of service delivery</td>
</tr>
<tr>
<td></td>
<td>product distribution policy</td>
<td>Coefficient of uniformity of input of products</td>
</tr>
<tr>
<td>Logistics of assortment flow</td>
<td>acceptance of the goods</td>
<td>labor productivity of employees of the distribution center (warehousing); coefficient of use of warehouse space</td>
</tr>
<tr>
<td></td>
<td>warehousing and storage</td>
<td>coefficient of logistic costs change per unit of turnover</td>
</tr>
<tr>
<td></td>
<td>pre-sale preparation of products (unpacking, sorting, marking)</td>
<td>coefficient of turnover of the cargo</td>
</tr>
<tr>
<td>Sales management</td>
<td>inventory management</td>
<td>level of customer service, coefficient of change of one-day turnover of a trading enterprise</td>
</tr>
<tr>
<td></td>
<td>merchandising</td>
<td>coefficient of change of the average purchase amount</td>
</tr>
<tr>
<td></td>
<td>organization of retail sales</td>
<td>coefficient of change in retail sales per 1 sq. m of retail space</td>
</tr>
<tr>
<td></td>
<td>sale</td>
<td>share of advertising costs in costs, level of staff turnover</td>
</tr>
<tr>
<td></td>
<td>customer service, promotion of goods</td>
<td>share of additional profit obtained through sales promotion, ratio of the average wage per salesperson to personnel training costs</td>
</tr>
</tbody>
</table>

Source: Designed by the authors

The first block for the assessment of the effectiveness of the trading process based on the process-logistic and client-oriented approaches is presented in Fig.2.

![Fig. 2. I block – methodology for assessing the effectiveness of the trading process based on process-logistic and client-oriented approaches](source)

Source: Designed by the authors

1 stage. Selection of process for the assessment of the effectiveness.
2 stage. Formation of a set of $P_n$ indicators to assess the quality of the implementation of the trading process. At this stage, a matrix of initial data is compiled. The form of presentation of the matrix of initial data, where indicators are systematized to assess the implementation of business plans (Fig. 3).

<table>
<thead>
<tr>
<th>Number of indicators</th>
<th>Trading networks (enterprises)</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>2</td>
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<td></td>
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<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Fig. 3.** Matrix of initial data on the quality assessment of the implementation of the trading process

*Source:* Designed by the authors

Assessment indicators are presented along with their reference value.

3 stage. Determination of the reference value of the indicator. The establishment of a reference criterion is based on the best indicators possible in the implementation of this trading process. For each indicator, the best (max) value is calculated and entered into the relative reference value column $a_{i0}$.

4 stage. Calculation of private trading process indexes – $I_n$. It includes standardization $a_j$ in relation to the reference $a_{i0}$:

$$P_{ij} = \frac{a_{ij}}{a_{i0}}$$  \hspace{1cm} (8)

where $a_{ij}$ – standardized indicators of the state of the j-th trading enterprise.

The ideal value is 1.

Thus, the basis for the assessment is the state of affairs of a trading enterprise that have emerged as high results from the entire set of compared objects. As a result, with this assessment approach, every trading enterprise strives to be the best (Kumara, Ramachandranb, 2016).


A generalizing indicator for assessment of the effectiveness of each trading process is determined as an arithmetic average of private standard indicators ($P_n$):

$$I = \frac{1}{N} \times \sum_{n=1}^{N} I_n$$  \hspace{1cm} (9)

where $I$ – generalizing indicator for assessment of the effectiveness of each trading process;

$N$ – number of private standard indicators of the quality of the process implementation.

The integral indicator of the efficiency of the enterprise’s trading process is calculated as the formation of three generalizing indices of trading processes based on the process and logistic approach:
Then the integral indicator of the efficiency of the trading process is calculated for a number of competing retail chains. The higher its own integral index is, the more it speaks about the effectiveness of the activities of the trading enterprise under study (Muradl, Ahmadov, 2019).

The advantage of the presented author’s methodology is based on the availability of a quantitative assessment of the level of implementation of trading processes, which allows to accurately determine the degree of its effectiveness. Using the presented algorithm allows us to simplify the assessment of decisions when choosing the right strategy for the development of a trading enterprise (Makedon, et. al., 2019b).

The adoption of management decisions based on the results of the analysis in order to improve the efficiency of trading processes, first, requires clarification of the influence factors. Secondly, it is necessary to carry out a whole range of measures that will improve the importance of each indicator characterizing this trading process and will produce a positive result in general. Thus, for the growth of the value of the coefficients of width and novelty of assortment, you need to constantly revise the assortment of trading enterprises; select groups of products that are not in demand, withdraw them from the nomenclature, replacing them with more attractive products for the customer. In this case, you can use the ABC-analysis. In order to increase the uniformity of supply of goods, it is necessary to adjust the relationship with suppliers, it is necessary to establish a procurement system on the principle of “just in time” and correlate the volumes of stocks to the current sales volumes.

II block – methodology for assessing the effectiveness of trading enterprise security management based on the use of QMS instruments.

1. It consists of the following stages (Cherry, 2007):
2. Analysis of the maturity levels of the management system of the trading enterprise.
3. Assessment of the resulting economic indicator.
4. Determination of the position of the trading company in the matrix of the development of the trading process.
5. Determination of the feasibility or inappropriateness of implementing a quality management system to ensure the effectiveness of the trading process.

The author analyzed the level of maturity of the trading enterprise management system based on the self-assessment methodology, compiled in accordance with ISO 9004, but approved to the requirements of ISO 9001 and the specifics of the functioning of trading enterprises based on the implementation of a quality management system. At the same time, the level of maturity was carried out on the basis of the process approach by an expert method. Therefore, criteria were developed for each process of the trading enterprise according to the appropriate levels of maturity. The overall level of maturity of the system will be determined by level, on average for most processes.

It is important to note that a distinctive feature of this technique is that it applies to almost all processes of the organization of the trading process. The second feature is the application of the project approach in the implementation of the quality management system, which allowed the construction of a performance management system for the trading process without using the functional approach and the ISO standard, which are usually used by consulting organizations (Makedon, et. al., 2019a).

A system of criteria is selected under each trading process of a trading enterprise according to 5 levels of development. These are indicators that characterize the maturity of each trading process (the minimum requirements apply to the 1st level of development, the maximum, according to the ISO 9004 standard - the 5th level). The level of development of the entire management system is defined as the arithmetic average value of the development of all processes of an enterprise. Determining the requirements for the level of development of the management system allows us to select the actions necessary to transfer each process of the trading enterprise to the next level of development.
The methodology for assessment of the trading process system based on QMS as an innovative instrument to ensure the effectiveness of the trading process includes the following steps:

– assessment of the development of retail chain management system in general;
– calculation of the effectiveness of trading activities;
– determination of the position of the trading company in the matrix of the development of the trading process;
– conclusions on the feasibility of using a quality management system to develop the trading company.

It has been proposed to assess the development of the retail network management system as a whole using the self-assessment methodology described in the ISO 9004 standard, but adapted to the requirements of the ISO 9001 standard and taking into account the characteristics of the trading enterprises. The level of development of a retail distribution network management system is assessed on the basis of a process approach with the involvement of experts Kordík, Kurilovská, (2019).

III block – analysis of trading process management system. It is carried out by calculating the effectiveness of trading activities, reflects the dynamics of the effectiveness of its development. Such a key resulting indicator for trading enterprises proposed to use the annual increase in turnover.

In order to determine the position of a trading company in the system of two coordinates, “quality of activity - the level of maturity of the management system” - “integral indicator of the efficiency of the trading process”: (Figure 4) it was proposed to use a matrix consisting of four areas:

1. low level of efficiency of the trading process (E≤0,4), weak level of management system development, low economic efficiency (area A);
2. middle level of efficiency of the trading process (0,41≤E≤0,6), medium level of management system development, low economic efficiency (area B);
3. middle level of efficiency of the trading process (0,41≤E≤0,6), low level of management system development, high economic efficiency (area D);
4. high level of efficiency of the trading process (E≥0,61), highly professional development of management system (area C), high economic efficiency.

![Fig. 4. Matrix of the development of the trading process](Image)

*Source:* Designed by the authors

Retail chains that fall into area A should strive to increase their efficiency, or they have the risk of losing their business and leaving the market. Regarding the use of possible innovations, a strategy of imitative development is applicable - a low level of intensive development. Further actions of the trading enterprise manage-
ment within the framework of the strategy are reduced to the fact that the retail distribution network borrows (duplicates) innovations implementation for the purpose of intensive development (Limba, Šidlauskas, 2018). This strategy can be effective in cases where the trading network is far behind competitors or develops a new format of trade.

5. Discussion

The enterprises entering the area B have a developed management system, but low turnover. A similar situation can be a consequence of high competition in the market or because the organization has recently entered a new market for itself. The strategy of survival with such a position will be to increase the client base, the formation of loyal customer, improvement of the quality of service and assortment. In this case, the simulation strategy is applicable or the result is saved.

For trading enterprises that have a position in the region of C, it is necessary to maintain the achieved advantage, the adopted strategy of development, the developed regulation in the management system. Such enterprises do not require a change in the management system. It is required from time to time to initiate self-examination of the management system to detect a negative change in occupied position. It is advisable to use a strategy to preserve the achieved positions.

The position of the organization in the field of D with high values of economic indicators indicates that its sphere of activity, the niche of the market, which it occupies, is not yet occupied and not mastered by competitors. The low level of competition allows a trading company to flourish with a weakly developed management level. However, with increasing competition, trade turnover will be higher among companies with strong management. They will be able to better satisfy the client. Therefore, in the long run, implementation of a quality management system is required, which allows for a high level of trade turnover (Protogerou, et al., 2017).

Trading enterprises that fall in areas A and B must, through the formation of a quality management system in the provision of the trading process, move to area C, since they have a very low increase in turnover.

The proposed method of self-assessment of the position of a trading enterprise allows you to determine the actions that are needed to move to the next level of development. If the trading enterprise decided to improve on the basis of the quality management system, the top management, based on the development levels, will set goals that allow the trading enterprise to improve. In order to achieve these goals, we need certain costs, which we called the costs for the quality management system. The effectiveness of the development of trade network management using the quality management system will be determined on the basis of an assessment of the degree of achievement of goals, and efficiency - on the basis of costs.

Conclusions

Thus, we can state that it was justified that the efficiency of the trading process is determined not only by economic indicators of enterprises’ economic activities, but also indicators of the effectiveness of certification, standardization and customer-oriented organization. The author proposed a methodology for a systematic approach to evaluating the effectiveness of the trading process.

The category of efficiency of the enterprise’s trading process as a result of entrepreneurial activity has been clarified; it is achieved through the rational use of resources at each stage of the process, while ensuring customer-oriented staff and consumers.

The method proposed by us, based on the application of the system approach, allows retailers to more fully and objectively assess the measures taken to improve their activities from different perspectives: quality indicators, classification of assortment and quantitative indicators (financial and economic performance).
The substantiation of the need to implement a quality management system (QMS), planning work on the development of QMS documentation, development of technical specifications for the design of QMS; project development of QMS documents; preparation of the schedule of implementation in the activities of a commercial enterprise; monitoring and measuring the quality of functioning, improving the QMS by making changes and finalizing the documentation was carried out.

A matrix for the development of the trading process has been proposed, which gives an assessment of the positioning of the trading enterprise and determines the development strategy, the choice of possible innovations and innovative technologies that will ensure the efficiency and security of trading processes.

References


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THREATS TO SUSTAINABLE DEVELOPMENT DUE TO INCREASE OF GREENHOUSE GAS EMISSIONS IN A KEY SECTOR

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Abstract. This study is aimed to analyze the tendencies of agricultural pollution and their impact on the incidence rates of the rural population of the Republic of Kazakhstan. A retrospective assessment of statistical indicators of agricultural emissions of greenhouse gases and pesticide load, as well as a comparative analysis of the incidence rate ratios of the population of Kazakhstan and other countries, are chosen as the main research methods. The study shows that an increase in greenhouse gas emissions from livestock and crop production, the introduction of pesticides and other chemical plant protection products lead to an increase in morbidity and mortality. The high growth rates of registered congenital anomalies among the rural population, as well as the incidence of cerebrovascular diseases and asthma, are especially disturbing. After studying and summarizing expert opinions, two priority directions that could contribute to reducing the level of agricultural pollution in the Republic of Kazakhstan have been identified. Measures should be aimed at improving the mechanisms for the use of pesticides in crop production, as well as reducing greenhouse gas emissions in Kazakhstan’s agriculture.

Keywords: CO2 emissions, agricultural pollution, environmental risks, agriculture, rural morbidity, mortality, environment


JEL Classifications: Q52, Q59.

1. Introduction

The development of farming and agriculture means is the basis of people’s lives in the modern world. Agriculture is the dominant component of the global economy, feeding the rapidly growing population of the planet. Agriculture takes 70% of the global freshwater withdrawal and reduces the natural habitat for 53% of endangered terrestrial species (Tanentzap et al., 2015).

Agriculture has been a natural process that did not damage the land for thousands of years. However, modern farming methods have changed the original ecosystem. Since the demand for food has increased, the environmental pollution caused by agricultural practice has increased in proportion to population growth.

Agricultural pollution is environmental pollution caused by the use of natural and chemical products for agriculture. This pollution is actually harmful to all living organisms which feed on crop and livestock products. Agri-
cultural pollution is one of the reasons for the increase in the incidence and premature death of the population.

The problem of natural agricultural pollution is still relevant for the Republic of Kazakhstan. The active development of Kazakhstan’s natural resources has led to enormous and often irreparable environmental damages. The main environmental problems in the country are caused either by the legacy of the Soviet times or by rapid economic development. The high energy intensity of the economy based on fossil fuels has a negative impact on the environment. Kazakhstan has an easily disturbed environment due to its geographical features, such as the predominance of semi-desert. Moreover, water scarcity and pollution also have a negative impact on public health and the economy. Air pollution, waste production, water scarcity and water pollution have an adverse effect on public health, the ecosystem, the environment and the economy (OECD, 2016a).

Addressing current environmental issues and climate change impact is of paramount importance in Kazakhstan, therefore, it is necessary to better understand these issues. Ospanova (2014) notes that the country’s current environmental problems are the disposal and processing of industrial, municipal and toxic waste, access to water, its quality and shortage, air pollution, the Aral Sea situation, land degradation and desertification, degradation of the Caspian Sea ecosystem, oil spills, biodiversity loss, and low share of renewable energy sources.

Although air and water pollutions adversely affect agriculture, agricultural methods lead to environmental pollution.

Wasteful water use, overuse of pesticides and fertilizers in agriculture raise a serious concern. Problems of water quality and increased salinity content arise from the evaporation of irrigation and drainage effluents (FLERMONECA, 2015). Desertification, erosion, and overgrazing have significantly reduced the area of agricultural land (FLERMONECA, 2015). Much land was lost due to the fact that vast areas of the Kazakh prairie were plowed during the Khrushchev’s agricultural project “Virgin Lands”. Sixty percent of the Republic’s pastures were at different stages of desertification by the mid-1990s.

Overgrazing is another problem of the Republic of Kazakhstan and other Central Asian countries. There are too many animals in a too small territory, which has led to desertification and soil erosion. According to some estimations, the restoration of used pastures and agricultural land will take from 10 to 50 years.

The above-mentioned problems prove that it is necessary to investigate more deeply the effects of agricultural pollution on living standards and to identify promising areas for improving environmental indicators in agriculture of the Republic of Kazakhstan.

2. Literature Review

The literature on the topic of this research is mainly focused on the conceptual problems of sustainable agriculture. According to Food and Agriculture Organization (FAO) (2018), sustainability means that agriculture provides a sustainable food supply, and also that its environmental impact, socio-economic conditions, and human health are recognized and taken into account in national development plans.

Global studies show that the agriculture of many countries of the world remains a significant contributor to the environment (Wen et al., 2017).

Most studies examine the level of agricultural pollution’s impact on water quality. According to Wen, Schoups and van de Giesen (2017), agriculture is responsible for discharging a large number of agrochemicals, organic matter, drug residues, sediment, and salt drainage into reservoirs. Water pollution caused by this creates obvious risks to aquatic ecosystems, human health, and production activities (Mateo-Sagasta et al., 2015).

Poor management of wastewater and agricultural drainage creates serious problems with water quality in many parts of the world and exacerbates the global water crisis (Oetjen et al., 2018). Serio, Miglietta, Lamastra, Fi-
cocelli, Intini, De Leo and De Donno (2018) consider that feces, slaughterhouse waste, etc. have tremendous sway with the quality of water resources.

Over the past 20 years, a pollutant has emerged in the form of veterinary drugs (antibiotics, vaccines and growth stimulants, such as hormones) that move through water from farms to ecosystems and drinking water sources (Boxall, 2012).

Many researchers agree that high levels of agricultural waste have a negative impact on various forms of aquatic life (Sato et al., 2013). For example, eutrophication caused by the accumulation of nutrients in lakes and coastal waters affects biodiversity and fisheries (Shin et al., 2015).

The studies by Seilkhan, Mizadinov, Mizadinov, and Kizdarbekova (2016) are devoted to studying the problems and connected with pastures and feeding grounds. Pasture degradation is a special environmental issue, faced by all Central Asian countries and countries of the Caucasus. This problem is important for the socio-economic welfare of local communities, as pastures are a strategic resource for economic development, especially in rural areas, providing environmental and food security (Robinson et al., 2017).

Bodemayer and Fabian (2015) consider that today degradation (desertification) has affected about one-third of the Earth’s surface. The sharp deterioration in regional food security, poverty, and hunger of the population are the consequences of desertification and drought. Social, economic and political tensions caused by these consequences can escalate into various conflicts, impoverishment of people and intense land degradation (Gintzburger et al., 2005). The growing level of desertification threatens the world with a sharp increase in the number of people who have migrate in order to find a way to make a living and a place to live (Dörre & Borchardt 2012).

Falling into drinking water pesticides, ammonia, heavy metals, fertilizers and oils from agricultural machinery and equipment create serious people’s health problems (Chen, Huo, Dai, Ma, Xu, Huang 2018). For example, studies by Ahada and Suthar (2018) prove that the increase in the incidence of methemoglobinemia (blue baby syndrome) causing children death is the result of a high nitrate level in groundwater, especially in rural water systems.

A World Health Organization (WHO) study based on a systematic review of the literature, as well as research from more than 100 experts around the world, identified specific diseases that are affected by some well-known aspects of the environment (Prüss-Ustün et al., 2016). Experts identified two groups of diseases caused by the environmental state:

Group 1 - infectious and parasitic diseases. It includes respiratory infections, diarrheal disease, intestinal nematodes, parasitic diseases, HIV/AIDS, tuberculosis.

Group 2 - non-communicable diseases, such as cancer; mental, behavioral, and neurological disorders; diseases of the sense organs; cardiovascular diseases, respiratory diseases; renal failure; diseases of the musculoskeletal system; congenital anomaly.

Most researchers conclude that it is necessary to develop methodological approaches to the quantitative assessment of arid pastures and the degree of soil degradation (Menta et al., 2018). Alimaev (2008) believes that methods of land improvement and sustainable management of degraded pastures need to be improved.

Literature review shows that the improvement of environmental performance in agriculture is a common problem. It can be solved by enhancing the beneficial and reducing negative environmental impacts in order to ensure sustainable resource use (Shaaban et al. 2018).
3. Methods

The purpose of this research is to study the types and dynamics of emissions in agriculture and to assess their impact on the population health of the Republic of Kazakhstan.

The study was conducted on the basis of statistical data of the FAO, the Committee on Statistics of the Republic of Kazakhstan, the WHO.

The first stage of the study includes a retrospective analysis of the statistical indicators for 2012-2016:
- Value-added of the agricultural industry in the country’s total GDP, %
- Pesticide consumption (kilograms per hectare of arable land)
- Agricultural emissions of carbon dioxide (thousand tons of CO2 equivalent);
- Agricultural methane emissions CH4 (thousand tons of CO2 equivalent);
- Agricultural emissions of nitrous oxide N2O (thousand tons of CO2 equivalent).

The second phase includes a comparative assessment of the agricultural pollution effects on public health. We used the following indicators:
- Mortality due to air pollution in the environment (per 100,000 people);
- The burden of environmental diseases (cases per 100,000 people).

4. Results

The Republic of Kazakhstan located in Central Asia is the ninth largest country in the world. The country shares borders with the Russian Federation in the north, with China in the east, with the Republics of Kyrgyzstan, Uzbekistan, and Turkmenistan in the south. In the west, it is washed by the Caspian Sea in the west and borders the Russian Federation. The country with a population of 16.7 million is one of the least densely populated countries.

The transition period to the market economy of the agricultural sector of Kazakhstan was difficult. Market reforms of land resources and agrarian property led to a significant transformation of the structure of agricultural production.

The country has sufficiently rich land resources. However, agricultural areas are affected by water scarcity and harsh climatic conditions. More than 90 million hectares of eroded and erosion-hazardous lands were registered in the Republic of Kazakhstan on January 1, 2016. The ongoing depletion of pastures leads to a decrease in the availability of water for livestock while changing weather conditions can cause flooding and early frosts which can lead to crop losses.

The depletion of water resources and an increase in temperature lead to an increase in aridity and a shift of the arid zone to the north. Significant changes can affect territories and land productivity. This can lead to the unprofitability of grain production in many areas.

The volume of greenhouse gas emissions from agriculture in the Republic of Kazakhstan continues to grow: their volume increased by 13.4% in 2012-2016. The contribution of the agricultural sector to the total amount of greenhouse gas emissions in the Republic of Kazakhstan remains rather low and stable at the level of 9.3%-9.5% (Fig. 1).
During 2012-2016, agricultural emissions of methane in Kazakhstan decreased by 50.8% from 23,955.6 thousand tons in CO2 equivalent in 2012 to 11,784.7 thousand tons in CO2 equivalent in 2016. At the same time, nitrous oxide emissions increased by 2%: from 8,525.1 thousand tons in CO2 equivalent to 8,696.1 thousand tons in CO2 equivalent (Fig. 2).

Agricultural greenhouse gas emissions include emissions from livestock (enteric fermentation, manure collection, storage, and use systems) and crop production (mineral and organic fertilizers, plant waste, rice production, burning agricultural waste and the burning of savannas). The structure of emissions from the agricultural sector of the Republic of Kazakhstan in 2016 is shown in Fig. 3.
Enteric fermentation and manure are the main sources of emissions, which account for almost 80% of total agricultural emissions.

Enteric fermentation is a source of methane emissions. Methane forms in the digestive process of ruminants. It also forms in the gastrointestinal tract of non-ruminant animals but in much smaller quantities. Emissions that are formed as a result of enteric fermentation largely depend on the quality of the feed. The more there is in the feed ration the proportion of poorly digestible roughage, the more methane is released into the atmosphere.

Animal fermentation emissions in the Republic of Kazakhstan amounted to 9,984.3 thousand tons of CO2 equivalent in 2016 and increased by 7.4% compared to 2012.

Emissions of storage and distribution of manure in agriculture of Kazakhstan increased by 112.7 thousand tons in CO2 equivalent in 2012-2016 and reached 1,843.8 thousand tons in CO2 equivalent. Greenhouse gas (GHG) emissions from plant residues in the Republic of Kazakhstan increased by 42.4% in the last five years (Fig. 4).
The effects of perennial pesticide use (including obsolete and unsuitable pesticides and pesticides with persistent organic pollutant (POPs) properties) in agriculture are one of the most pressing problems of soil pollution in the Republic of Kazakhstan.

Despite the reduction of agricultural land areas, the use of plant protection chemicals has not changed and even increased. A specific application of pesticides per one ha of agricultural land went up almost by 1.7 times: from 0.29 kg/ha in 2012 to 0.493 kg/ha in 2016 (Fig. 5). The annual volume of applied pesticides varied from 10 to 11 thousand tons for the period.

Nowadays, over 1.5 thousand tons of pesticides and their mixtures are stored in the warehouses of the Republic of Kazakhstan. At the same time, about 10% of them belong to the group of POPs (Analytical Environmental Agency “Greenwomen”, 2018).
Agricultural pollution has a significant impact on public health, the environment, crop yields, biodiversity, and the state of land and water resources.

The OECD study (2016b) showed that air pollution leads to 2,800 premature deaths and exceeds $1.3 billion in healthcare expenditures in Kazakhstan.

According to WHO estimates, about 20% of deaths in Kazakhstan are related to environmental exposure. According to this indicator, Kazakhstan is inferior to Russia and Belarus (Fig. 6). This indicator is at the level of 11%-13% in countries with advanced economies. The mortality rate of the population due to the state of the environment in the Republic of Kazakhstan remains quite high at 224 cases per 1,000 population.

According to WHO, in Kazakhstan, almost 24,996 deaths from 31,265 cases related to environmental factors are caused by non-communicable diseases such as stroke, coronary heart disease, oncology, and chronic respiratory diseases.

The mortality rate of the rural Kazakhstani population decreased from 789.78 cases per 100,000 rural population to 698.5 cases in 2012-2016. At the same time, the mortality structure of the rural population has not changed significantly. The main cause of death in the rural population was diseases of the circulatory system: in 2016, the figure was 138.62 cases per 100,000 rural population. Respiratory diseases are in the second place and oncology occupies the third place (Fig. 7).

Figure 6. Total mortality due to the state of the environment in the Republic of Kazakhstan and some other countries (according to 2012 data).

Source: Compiled by authors.

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1 Preventing disease through healthy environments: a global assessment of the burden of disease from environmental risks.
According to the WHO, the indicator of diseases caused by the state of the environment in the Republic of Kazakhstan is much higher than in Russia, Armenia, Belarus, and China (Fig. 8).

The incidence among the rural population in the Republic of Kazakhstan is steadily increasing. For example, this indicator increased by 9.6% for 2012-2016 (Table 1).
Table 1. The incidence of the Kazakhstani rural population in 2012-2016, the number of cases per 100,000 people

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>The number of diseases recorded for the first time in life</td>
<td>4,3150.4</td>
<td>42,720.9</td>
<td>4,1632.6</td>
<td>44,081.5</td>
<td>47,305</td>
<td>4154.6</td>
</tr>
<tr>
<td>Infectious and parasitic diseases</td>
<td>867.5</td>
<td>841.8</td>
<td>801.6</td>
<td>816.4</td>
<td>902.5</td>
<td>35</td>
</tr>
<tr>
<td>Neoplasms</td>
<td>235.3</td>
<td>226.4</td>
<td>258.6</td>
<td>294.4</td>
<td>325.8</td>
<td>90.5</td>
</tr>
<tr>
<td>Circulatory system diseases</td>
<td>2,290.2</td>
<td>2,222.4</td>
<td>2,300.6</td>
<td>2,306.6</td>
<td>2,408</td>
<td>117.8</td>
</tr>
<tr>
<td>Diseases characterized by elevated blood pressure</td>
<td>1,181.4</td>
<td>1,178.2</td>
<td>1,196.2</td>
<td>1,197.5</td>
<td>1,242.1</td>
<td>60.7</td>
</tr>
<tr>
<td>CHD</td>
<td>141.5</td>
<td>139.8</td>
<td>149.1</td>
<td>195</td>
<td>248.2</td>
<td>106.7</td>
</tr>
<tr>
<td>Acute myocardial infarction</td>
<td>36.7</td>
<td>40.5</td>
<td>45.4</td>
<td>49.3</td>
<td>59</td>
<td>22.3</td>
</tr>
<tr>
<td>Respiratory diseases</td>
<td>18,798.8</td>
<td>1,9116.8</td>
<td>1,8267.1</td>
<td>19,010.1</td>
<td>20,668.9</td>
<td>1,870.1</td>
</tr>
<tr>
<td>Asthma</td>
<td>125.3</td>
<td>120.8</td>
<td>120.9</td>
<td>186.2</td>
<td>221.4</td>
<td>96.1</td>
</tr>
</tbody>
</table>

Source: Compiled by authors

Diseases of the respiratory system are widespread in the Kazakhstani rural population. They account for 43.5% of registered patients with a diagnosis established for the first time in their lives.

The incidence of brain diseases caused by pathological changes in cerebral vessels and impaired cerebral circulation has significantly increased. The burden of cerebrovascular diseases among the rural population of the Republic of Kazakhstan increased by 75.4% and amounted to 248.2 cases per 100,000 rural residents during the period.

Cases of asthma also increased (+60.8%). The main cause of asthma is a genetic predisposition. However, recently, the development and aggravation of this disease are also explained by the influence of various environmental factors. For example, air pollution induces oxidative stress, leading to inflammatory reactions in the airways and bronchial hyperresponsiveness.

A significant increase (+76.7%) of congenital anomalies was noted among the rural population of Kazakhstan. Congenital anomalies include chromosomal conditions, such as Edward syndrome, and non-chromosomal conditions, such as various congenital organ defects. Many studies show that there is a stable connection between prenatal exposure to pesticides, organic solvents, air pollution, and congenital heart diseases, as well as between the effects of certain chemicals that destroy the endocrine system and the development of urinary tract malformations.

Thus, environmental pollution caused by emissions of greenhouse gases, enteric fermentation, emissions from manure storage and distribution systems, plant debris, as well as an increase in pesticide load, adversely affect the health of the population in the agricultural areas of the country.

5. Discussion

Improving the environment for health can make an important contribution to achieving the goals of the country’s sustainable agricultural development. Many of these goals are closely related to environmental and social determinants.

Experts identify several approaches that can reduce the burden of diseases caused by the low ecology of agricultural production and promote a healthier lifestyle.
The first approach requires reducing the risk of pesticide use. Now, chemical products remain the most widely used plant protection products in the region. Many of these substances are extremely toxic. In their application, farmers must work under special conditions and use personal protective equipment, which is unattainable for Kazakhstani farmers.


To fulfill its obligations, the Republic of Kazakhstan has developed a National Implementation Plan for the Stockholm Convention on POPs for 2015-2028 (National Implementation Plan for the Republic of Kazakhstan, 2014). This document contains all the necessary elements reflected in the Guidance for Developing a National Implementation Plan for the Stockholm Convention on POPs. At the same time, international experts point out some problems of the National Plan, such as the lack of a mechanism for the process of consultative interaction between stakeholders, the lack of a technical infrastructure for measuring and analyzing alternatives to POPs, as well as for managing and destroying them. Also, the participation of the agricultural sector in the implementation of the National Implementation Plan is not clearly defined. Moreover, in the process of implementation of the Stockholm Convention, the Republic of Kazakhstan faced a number of difficulties caused by insufficient resource provision, gaps in the regulatory framework, the lack of intersectoral cooperation and poor coordination between government agencies, insufficient training of specialists in this field, etc.

According to market experts, there is much concern about the estimating emissions of POPs in Kazakhstan because nowadays, the system for regular monitoring of POPs does not exist in the country. The state enterprise Kazgidromet monitors the state of the environment. However, this organization does not monitor POPs throughout the Republic of Kazakhstan.

According to the Environmental Code of the Republic of Kazakhstan, nature users are obliged to carry out environmental monitoring, which includes production monitoring. However, the list of substances for environmental monitoring is limited and does not include POPs.

An important problem is the inappropriate use of equipment for identifying POPs. According to G. Maikenova, expert of the UNDP project, its main reason is the lack of regulatory bases, as well as the lack of qualified workers.

To solve the priority problems in the use of POPs in agriculture, it is necessary to make an inventory of the burial grounds and quantify the stored pesticides, recalibrate and store POPs in an environmentally safe way in special storage facilities for subsequent destruction.

Another approach to reducing environmental risks requires reducing greenhouse gas emissions in the agriculture of the Republic of Kazakhstan. According to studies by the European Bank for Reconstruction and Development and by the Food and Agriculture Organization of the United Nations, targeted investments can significantly reduce these emissions. Experts say that an investment of $ 2.3 billion in the agro-food sector of Kazakhstan will reduce CO2 emissions by 30%.

Experts point out that improving pastureland, saving and precision farming contributes to reducing emissions. The same analysis from the point of view of adaptation to climate change shows that drip irrigation is the best way to improve water availability and agricultural production.

Experts estimate that pasture improvement technologies (for example, planting saxaul on desert and semi-desert pastures; producing roughage by sowing perennial grass species on fallow lands; irrigation of desert, steppe and meadow-steppe pastures where it can be applied) have the highest potential for greenhouse gases mitigation (57% of the total) due to the substantial removal of soil carbon. Improved pastures make it possible to increase agricultural productivity by increasing the yield of hay from 0.3 t/ha to 0.9 t/ha, and, under certain
conditions, contribute to the prevention of land degradation.

According to experts, the potential of saving agriculture in the Republic of Kazakhstan is used by 36% and covers an area of 2.6 million hectares. The area of potential introduction of conservation agriculture in the Republic of Kazakhstan is estimated at 7.2 million hectares. It represents 40% of the total area under crops for grain, oil, and legumes. Experts believe that the potential reduction in greenhouse gas emissions from the use of conservation agriculture is 2.3 million tons of CO2 equivalent per year.

The current level of implementation of the precision farming technology in the Republic of Kazakhstan is 17% of the estimated potential. According to S. Nukeshev, dean of the Technical Faculty of S. Seifullin Kazakh AgroTechnical University, first of all, the introduction of new technologies (parallel driving, differential fertilization of fertilizers, herbicides, yield monitoring) is necessary for crop production. The development of precision farming in northern Kazakhstan (forecasting optimal terms for sowing, fertilizing, weed control, etc.) will reduce up to 122 thousand tons of CO2 equivalent/year.

Thus, the above measures aimed to reduce agricultural pollution of the environment, will reduce the incidence and improve the living standards of Kazakhstan.

6. Conclusion

The following conclusions were made based on the results of the study:

Agricultural pollution caused by greenhouse gas emissions, including emissions from livestock and crop production and the pesticide load on land resources, has been showing steady growth for five years.

The enteric fermentation, as well as manure collection, storage and distribution system, make up the largest proportion of agricultural pollution.

The application of pesticides and other chemical plant protection products increased with the reduction of agricultural land. As a result, the pesticidal load increased by 1.7 times.

The growth of agricultural pollution negatively affects public health and living standards. The Republic of Kazakhstan is ahead of high-income countries, as well as Belarus and Russia, in terms of mortality rates and the burden of diseases caused by the state of the environment.

The incidence is steadily increasing among the rural population. The number of cases of congenital anomalies and the incidence of cerebrovascular diseases and asthma are increasing especially rapidly.

A set of measures is needed to reduce the burden of diseases caused by environmental pollution. These measures should be aimed at reducing the risk of pesticide use and greenhouse gas emissions in the agriculture of the Republic of Kazakhstan.

References


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TOWARDS ECONOMIC GROWTH: THE IMPACT OF INFORMATION TECHNOLOGY ON PERFORMANCE OF SMES

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Abstract. This is a conceptual article to study the economic effects of SMEs performance. It has become a widely recognized that entrepreneurs and Information Technology (IT) have become the backbone of the world’s economy. In fact, entrepreneurs are commonly considered an asset for the economic development of the society as well as the country. The current studies focus on the nature, process and practice of the matter SMEs and Information Technology in entrepreneurship for the development and implementation throughout the world, and provide entrepreneurs, managers and practitioners with up-to-date, comprehensive and effective strategies for business plans with an effective method of using Information Technology in society. However, massive and ongoing transformations are characteristics of this environment and business environment, which underscores the need for greater attention to be paid to the business environment. Furthermore, modern organizations do activities in complex environment and in the meantime dynamic. This paper aims to discuss the importance of entrepreneurship in today’s society. Therefore, entrepreneurs can play an important role in assisting and fostering business success to benefits the society. Extensive changes, increased complexity and competition are the most important features of today’s world. In addition, Information Technology can assist the business to create value, better performance, increase productivity and quality. Finally, information technology is important to the business sector as a management tool to optimize the processing of information to produce goods and services for profits.

Keywords: Economic growth; Information Technology; SMEs; Economics; Business Performance; Value, Society


JEL Classifications: D00, D01, E3

1. Introduction

Due to vital contributions to each country’s economy, small and medium-sized enterprises (SMEs) have paid much attention in recent entrepreneurship research. The appearance of SMEs is particularly important in all developing countries where they support economic growth; improve the distribution of income, productivity, efficiency and economic structure during the economic downturn (Abdullah & Manan, 2011; Kowo et al., 2019). Due to flexible and compatible structures, small and medium-sized enterprises (SMES) have become more important to the world (Kayadibi et al., 2013). In the era of worsened economic crisis worldwide where financial institution are merging, industries are being downsized, productions are being minimized, as a response to which inflation is rising at a high pace, unemployment is becoming a world’s dilemma, money is losing worth, and in total giant economies are collapsing. However, there still exists a field/sector or an industry which is ever increasing since the time of its existence and even proving out to be a support to falling economies in this time of economic recession (Information Technology). In addition, the biggest business growth in the past
two decades was like Facebook, Twitter, Linked In, Instagram, etc. are pretty prominent success platforms. The reason for the very fact is the diversification and advancement in the Information Technology, it has both tangible and intangible benefits that will help the society to create value and produce the results which customers demand. Technological infrastructure affects the culture, efficiency and relationships of a business. It also affects the security of confidential information and trade advantages (Korauš, 2019a, 2019b; Ključnikov et al., 2019; Davidavičienė et al., 2019).

The information revolution is sweeping through economy, so no company can escape its effects. Dramatic reductions in the cost of obtaining, processing, and transmitting are changing the way doing business. However, the technologies will help the SMEs to improve and develop each day and availed globally while the rate of usage and exploitation of technology is dependent on factors which have huge influence on business. Finally, business is regarded to have the potentials to significantly increase success and performance of the work quality.

SMEs play a significant role in economies by providing a large portion of production in the rapidly changing world due to adaptability features. However, SMEs show major contribution in the development of a county’s economy, its political stability as well as social uplifting. In fact, SMEs are flexible in nature, they can be established for all kind of activities of every business and are considered as a backbone of country’s economy (Solesvik, 2012). The government has given much attention on the development of SMEs because of their significant role in the economic development and improvement (Khaliq et al., 2012).

Several research gaps are identified that relates to the Information Technology to improve SMEs/businesses. These are summarized as follows:
1. Despite the SMEs are the backbone of the economy that help the society to have better place.
2. SMEs and Information Technology have had an impact on multiple aspects of the business and how communities and regions grow and succeed.
3. Organizations need to understand the importance of IT improvement and development outcomes, which influence on growth and success of SMEs.
4. In fact, majority of Information Technology advancement appears in the developing world for the sake of success.
5. Organization SMEs that use IT for-business transactions and for the support of success and growth.
6. The majority of businesses in the world are SMEs which adopted the information technology to improve and increase sales and revenue.

According to Manirafasha, Ndikubwimana, Zeng, Lu, & Jing (2016), those development outcomes from IT adoption in SMEs have to be allied with the businesses. Alonso-Mendo, Fitzgerald, & Frias-Martinez, (2009), also find that website redesign has to be allied with the SMEs businesses function. It appears so far that SMEs and individuals within have a very unique perspective towards the usage of IT development, approaches to promote IT, and expected outcomes.

2. Literature Review and Hypotheses

It is very essential to understand entrepreneurs in the context of emerging economies because the entrepreneurial competencies for business growth and survival in emerging economies are different from those of in developed economies (Solesvik, 2012). Majority of the SMEs are struggling to increase productivity, organizational effectiveness, sustained competitive advantages and satisfactory rates of return on investments for the society (Hussain, & Raghavan, 2017). To increase SMEs’ competitiveness in global markets, which should be financially sound and should be well connected to markets. This, however, is not going to be easy in an economy where traditional and informal practices of business management are still applied. It is evident from research that innovative technological strategies are a key resource for gaining competitive advantages, but this is challenging because some enterprises lack entrepreneurship and innovative skills. Consequently, many businesses fail and close a few days after they start (Ndikubwimana, 2016).
SMEs are realizing the benefits of using new technologies, but some need specific support and guidance before they use digital technologies. Although the government and other development partners have rolled out a number of initiatives as far as digital technology is concerned, there seems to be a huge gap in awareness among SMEs about the changes that are inevitably brought about by technology in terms of business growth and how they should adapt to this shift. The focus has shifted from whether or not to use technology to understand which technologies can be used for what specific business purposes and also on investigating how they can best be applied in a range of contexts. In fact, SMEs are excited about the changes brought about by the use of technology in business there are also many challenges including lack of network infrastructure, lack of supports and slow unstable access to the advancement of technologies. Some SMEs do not have the bandwidth to support internet activity in their businesses. This provides a great challenge in the communication process between staff members and the management (Zandi & Haseeb, 2019). The other challenges are poverty, not enough knowledge and lack of training on how to use digital technology. In addition, ensuring that technology is used to enable and to advance effective business practices is also a big challenge. Hence, there is a need to investigate the effects of digital technology adoption in SMEs in every country. The purpose of our study is to investigate SMEs’ employees and management attitudes and perceptions about adopting and using technology in businesses to come up with the factors that are hindering its adoption and use by SMEs.

Entrepreneurship is more than the mere creation of business and the characteristics of seeking opportunities, taking risks beyond security, and having the tenacity to push an idea through reality (Schaper, 2002; Hussain, & Raghavan, 2017). Entrepreneurship is the symbol of business tenacity and achievements. The single definition of entrepreneurship doesn’t exist considering the openness and depth of entrepreneurship as a concept. (Abdullahi, 2015), consider the use of technology in business as one of the changing trends in the era of hyper business and commercialization. Entrepreneurship is the most powerful economic force to mankind (Kuratko, 2007; Hussain, & Raghavan, 2017). Competitiveness, goal-oriented behaviour, confidence, opportunistic behaviour, intuitiveness, reality-based actions, ability to undertake certain risk and make decisions in conditions of uncertainty are other characteristics of entrepreneurship (Kuratko, 2007; Ndinguri, Machtmes, Machtmes, & Hill, 2018). Besides, entrepreneurs use technical knowledge as a vibrant resource to overcome resource shortage (Shane, 2008; Suyono, Sukoco, Setiawan, & Rahim, 2017). According to Garcés-Galdeano, et al., (2016), states that innovation is one of the basic characteristics of a successful entrepreneur, it could be beneficial to indulge IT in the ventures. Olatunji, O. S. (2015), states that information technology (IT) plays an indispensable role in making a company successful under uncertain and turbulent economic conditions. IT and Entrepreneurship are factors of encourage in investment. The role of information technology in entrepreneurship has been studied in some parts of the world. Many factors have been identified as being associated with entrepreneurship. For example, entrepreneurial activities combine many personality traits - innovativeness, risk taking, proactiveness in the sense of doing what is necessary to realize their ideas combined with shouldering responsibility for success (Morris et al., 1996 and Caniëls et al., 2015). In fact, IT systems affect a firm’s products and services, markets, product cost, and product differentiation. However, entrepreneurship is as the process of creating value by combining a unique mix of the aforementioned concepts in order to get success in business opportunity. According to Berisha-Namani, M. (2009), introduces information technology in line with social entrepreneurship as leverage for the sustainable development. Jones, P., Beynon, M. J., Pickernell, D., & Packham, G. (2013), stated that IT has a great impact in the decision of the people with regards to their living condition in digital world. Efficiency and improvement are the importance of work success. Below conceptual framework of the study is presented (Figure 1).
There are the research hypotheses of the study:
H1: The strategic competency is in significant relationship with the business success.
H2: The commitment competency is in significant relationship with the business success.
H3: The technical competency is in significant relationship with the business success.
H4: The relationship competency is in significant relationship with the business success.
H5: The personal competency is in significant relationship with the business success.
H6: The usefulness of information technology is in significant relationship with the business success.
H7: The usefulness of information technology mediates the relationship between strategic competency and business success.
H8: The usefulness of information technology mediates the relationship between commitment competency and business success.
H9: The usefulness of information technology mediates the relationship between technical competency and business success.
H10: The usefulness of information technology mediates the relationship between relationship competency and business success.
H11: The usefulness of information technology mediates the relationship between personal competency and business success.

3. Variables of the Study

3.1 Strategic Competency

Strategic Competency refers to setting, evaluating, and implementing the strategies of the firm and knowledge-based competencies which including the project management, analytical thinking, and the ability to learn new things (Man et al., 2002; Mulder et al., 2014). According to Gallardo, A. R., et al. (2015), strategic competency mostly related to behaviours such as: redesigning the firm to better meet the firm’s objectives, aligning current actions with strategic goals, monitoring progress toward strategic goals, evaluating results against strategic goals, and determining strategic actions by weighing costs and benefits. Strategic competency will help the firms to perform better in products and service. Furthermore, according Gallardo, et al. (2015) and Jayaram et al., (2014), strategic competency identify some competencies which are require for business success such as technical knowledge and skills, cognitive abilities, creative problem solving, communication, commitment and courage. However, it needs to understand what is tactically and operationally feasible in different situation of success and the effective business success on organization (Gallardo, et al. 2015; Mueller et al., 2015).
3.2 Commitment Competency

Commitment competency refers to behaviours that drive entrepreneurs to move ahead with the business success (Man et al., 2002; Shenura et al., 2016). In fact, commitment competency vital of possessing these competencies allowed entrepreneurs to strive towards business goals and objectives of the organizations. With the development of modern economy, more and more enterprises come to realize the intimate relationship between commitment competency and organizational success, therefore, the concept commitment competency is more involved in management and becomes an effective index of prediction of organizational success. Allen et al. (1990) and Shaul et al. (2012), defined three components of commitment competencies with the following statement: success with strong affective commitment remain because they want to, those with strong continuance commitment because they need to, and those with strong normative commitment because they feel they ought to do.

3.3 Relationship Competency

Relationship competency is defined as the organization of different internal and external human, physical, financial, and technological resources, including team building, leading employees, training and controlling in business environment for the sake of success and profits (Man and Lau, 2002). In business environment, entrepreneurs are required to have good relationship that deal with people including suppliers, customers, employees, government authorities, stakeholders and other resources (Batselé et al. 2019). Competency refers to the individual’s abilities, skills and knowledge which enhance the sales growth and profits (Stumm, & Morgan 2012). Moreover, the relationship competency plays the roles in analysing the organizational problems, making important decisions and innovating in new processes, products and services to increase sales and profits. It also related to personal knowledge and abilities that increase the success and sales growth in firms. Besides, every entrepreneur therefore, need to possess and acquire interpersonal and communication skills. The relationship competency also relates to skills in person-to-person or individual- to-group-based interactions, such as building a context of cooperation and trust, using contacts and connections, persuasive ability, communication and interpersonal skill (Man et al., 2002). To successfully do so, the entrepreneur needs to possess competencies in relationship building, communication, persuasive, and interpersonal abilities (Gasse et al., 1997).

3.4 Personal Competency

Personal competency defined as the ability to maintain a high level of energy, motivate self to function at optimum level of business success, respond to constructive criticism, maintain a positive attitude, priorities tasks to manage time, identify own strength and weaknesses and match them with opportunities and threats, as well as recognize and work on own shortcomings. Moreover, personal competency includes determination and self-belief (Thompson, Hinton, 1997), self-awareness (Cherniss et al., 1998), self-control and stress tolerance (Markman et al., 1998), and self- management. It defined as knowledge, skills and abilities. Personal competency is related to the set of skills to include self-awareness, self-management, social awareness, relationship skills, and responsible decision-making (Veliu et al., 2017). However, personal competencies are an ever-evolving accumulation of related to skills and knowledge which help to achieves goals and objectives of the organizations. Personal competency are underlying characteristics of a person and consistent patterns in the way individuals behave, feel and think.

3.5 Technical Competency

Technical competency refers to the ability to use the tools, procedures, and techniques which require for the specialized field to achieve the objectives of the organizations (Tripathy et al., 2016). Technical competency related to experiences, skills, and knowledge. According to Medina et al., (2014), it has a positive significant impact on sales growth. In addition, skills are based on knowledge, skills and skills that enhance business success. These competencies include work skills specifically involving methods such as processes, procedures in business success. Technical competency also related to the abilities, knowledge, skills and techniques in business environment for success and development. In fact, entrepreneurs use these competencies in business success and increasing products and services (Hasanefendic et al. 2016). And also, it refers to behaviours of
competencies such as use specific techniques and utilize technical knowledge relevant to the business success (Rahman, 2015).

3.6 The Usefulness of Information Technology (IT) in SMEs

The usefulness of information technology (IT) in small and medium enterprises (SMEs) is vital on the economy’s a country and it considered to be the backbone of industrial development in every nation (Saleh, & Ndobisi, 2006; Kurnia et al., 2015). According to Adamson et al. (2007) and Morgan-Thomas (2016), IT in SMEs are drivers of economic growth, success and innovation. SME is the most popular business entities registered by entrepreneurs because of simple ownership structure, less procedural registration process and flexible in decision making process. Thus, based on the effective performance in business environment, it is considered that IT in SME has huge impact on organization development and improvement. In fact, every country is relying on the SME as the engine of economic growth and success. In this regards the engagement of knowledge, skills and abilities will ensure the success and sustainability of SMEs to increase profitability (Chang et al., 2011), and eventually will contribute to the economic growth and sales volume. Nguyen et. al. (2015), noted that information technology is one of the most important factors of any production activity and technological changes can have profound consequences.

In addition, IT knowledge, skills and abilities can be a tool to improve SMEs performance and products development. However, it is encouraging to note that the current level of understanding of IT among SMEs is reasonably well developed and succeeded. In fact, developed countries in particular has advanced immensely through the numerous benefits that IT provides. The emergence of IT has helped organizations achieve better coordination and collaboration among supply chain partners and automate the supply chain process (Hsin, C., & Papazafeiropoulou, A. (2008). However, IT particularly the Internet is having a significant impact on the operations of SMEs and it is claimed to be essential for the survival and growth of nation’s economies. The ability of IT in SMEs is that to realize goals depends on how well the organization acquires, interprets, synthesizes, evaluate and understands information technology and how well its technologies supports organizational processes and performances. These technologies will continue to enable the growth and success where SME operate across national boundaries. Today, new technologies, especially Internet technology are changing the global flows of information, trade and investment and the competitive advantage of industries, services and regions. These changes are requiring from all enterprises, no matter of their size to invest in the adoption of new technology. The ability of IT in SMEs is to survive in an increasingly competitive and global environment is largely influenced upon their capacity to access information as a resource and usage of new technologies. Greater use of these technologies is often associated with improved availability of information, quality of work, effectiveness and efficiency in accomplishing tasks. IT in SMEs is very important in the development of the countries, economies and enterprises (Nguyen et al., 2015).

3.7 Business Success

Business success is often defined as the achievement of a favourable and desired outcome (Brüderl, & Preisendörfer, 1998; Oyeku et al., 2014). The achievement of goals and objectives for better quality services by human endeavours (Oyeku et al., 2014). The researchers who prefer financial measures of success usually argued that for the success of the organizations, it is vital to generate profits and to show some level of growth which is represented by volume of their sales (Gimm et al., 2000). Wiklund, J. (1999) suggested that both aspects of performances i.e financial and nonfinancial complement each other and indicate the actual performance of business. Lucky (2011) Related to efficiency, growth, profit, size, liquidity, market share and leverage. Thus, it is not sufficient to focus only on
financial performance while neglecting the other measures that indicate the business success as well (Buttner, & Moore, (1997). Watson, & Robinson, (2003) argued that both the financial and non-financial dimensions of organizational performance are needed to be emphasized in the future studies to capture total organizational performance. Thus, this paper also includes both financial as well as non-financial indicators of SMEs business success in its proposed conceptual model. The achievement of goals and objectives of a company, which is not explicitly defined (Erickson et al., 1989).

4. Methodology

The following section provides the data analysis including the illustration and discussion about the research findings. For the purpose of data analysis, the Structural Equation Modeling is used in this study. The Structural equation modeling is a statistical multivariate technique for analyzing the structural associations. It is a combination of multiple regression analysis and factor analysis and is generally employed to analyze the existence of structural association between the measured and the latent constructs. Researchers prefer to use this method because it is capable of estimating multiple as well as interrelated associations in a single analysis (Hair et al., 1998). After the selection of methodology, sample collection was done using a method of cluster sampling. For the sample size estimation, the first step is the total population determination. The sample size for this study is determined using Krejcie and Morgan’s (1970) sample size table. Gay and Diehl (1992) suggested that the required sample size for a study depends upon the type of research i.e. experimental, descriptive or correlational. The present study has chosen SEM as it is a second-generation statistical technique, providing robust results. Besides, SEM-PLS allows the statistical modeling and estimation of complex phenomena. Therefore, became the most preferred method to assess the theoretical models under quantitative researches. It enables researchers to assess the complex and advanced theoretical models without much dependency on statistical methods. Finally, SEM software is also user-friendly, just as other Window-based software. SEM model consists of formative and reflective constructs. The objective is to determine the prediction among the constructs. For many years, researchers have been using EQS, AMOS, and LISREL as the software tools for performing such analysis. However, PLS-SEM is a useful alternative to CB-SEM, with distinctive methodological features. The estimated population size is 22000 and the selected sample size is 377. Thus, 377 survey questionnaires were distributed, and 269 questionnaires were received back, thus the response rate came out to be 71%, which is above the threshold level (45% -50%). The gathered questionnaires were then undergoing the process of further evaluation. From the total respondents chosen for the study, there were 198 male respondents and 71 female respondents, with the average age of 43 years. On average, 58% of the total respondents were found to be part of the operational department for past 10 years.

4. Results and Discussion

Results

SEM-PLS involves two types of models: i.e. Measurement model and the Structural model. The measurement model shows how the measured variables are related to represent a specific theory. Whereas, the structural model shows whether the constructs involved in the model are related to other constructs. It is also known as causal modeling, since it tests the assumed causal association between the constructs. The first step in PLS-SEM estimation is determining the measurement model also referred as CFA i.e. confirmatory factor analysis. In CFA, the theoretical measurement is compared with the proposed reality model. The CFA is usually used to assess how well the variables involved in the model are observed. The CFA’s result must be related to the validity of the construct (See: Figure 2 ‘Measurement Model’ and Table 1 ‘Outer loadings’).
Fig. 2. Measurement Model

Table 1. Outer loadings

<table>
<thead>
<tr>
<th></th>
<th>BS</th>
<th>OC</th>
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<th>RC</th>
<th>SC</th>
<th>TC</th>
<th>UTI</th>
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<tr>
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<tr>
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<tr>
<td>BS5</td>
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<tr>
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<td></td>
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<tr>
<td>PC1</td>
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<tr>
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<td></td>
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<td>0.893</td>
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<tr>
<td>SC3</td>
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<td>0.899</td>
</tr>
</tbody>
</table>
Strong correlation between the variables is expected since all the items have dynamic nature. The study estimated each element using formative, reflective and structural modelling. Fornell-Larcker criterion was used to determine the model validity. The discriminant validity criterion is a powerful and a widely used measure employed in research studies. Discriminant validity is the extent a construct is empirically distinctive from the other constructs. It also analyzes the correlation among the concepts (Hair et al., 2014) and whether these concepts possess the potential to overlap (Ramayah et al., 2018). (See below Table 2 ‘Discriminant Validity’).

Thus, the square roots of AVE (average variance extracted) were also compared against the correlations of latent variables to assess the Fornell-Larcker criterion. For each variable, this square root of AVE must exhibit value greater than the correlation it have with other latent constructs (Hair et al., 2014). The value for AVE square root turned out as required and in line with the criterion. Therefore, representing the discriminant validity. The outer and cross loadings for the current study were found to be same. The cross-loadings determine the presence of any correlation between the items of the constructs, Table 2 presents the discriminant validity among the variables and the constructs. The reliability index or the internal consistency value must also be above 0.70 to confirm the model reliability (See below Table 3).

<table>
<thead>
<tr>
<th>BS</th>
<th>OC</th>
<th>PC</th>
<th>RC</th>
<th>SC</th>
<th>TC</th>
<th>UTI</th>
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</thead>
<tbody>
<tr>
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<td></td>
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<td>0.614</td>
<td>0.911</td>
<td></td>
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<tr>
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<td>0.650</td>
<td>0.649</td>
<td>0.938</td>
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<tr>
<td>RC</td>
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<td>0.695</td>
<td>0.929</td>
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<tr>
<td>SC</td>
<td>0.616</td>
<td>0.892</td>
<td>0.690</td>
<td>0.911</td>
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<tr>
<td>TC</td>
<td>0.677</td>
<td>0.670</td>
<td>0.921</td>
<td>0.725</td>
<td>0.674</td>
<td>0.931</td>
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<td>UTI</td>
<td>0.677</td>
<td>0.692</td>
<td>0.897</td>
<td>0.734</td>
<td>0.687</td>
<td>0.921</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BS</th>
<th>OC</th>
<th>PC</th>
<th>RC</th>
<th>SC</th>
<th>TC</th>
<th>UTI</th>
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<tr>
<td>Cronbach’s Alpha</td>
<td>rho A</td>
<td>Composite Reliability</td>
<td>Average Variance Extracted (AVE)</td>
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<tr>
<td>BS</td>
<td>0.933</td>
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<td>0.788</td>
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<td>OC</td>
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<td>0.960</td>
<td>0.829</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PC</td>
<td>0.933</td>
<td>0.934</td>
<td>0.949</td>
<td>0.789</td>
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<td></td>
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<tr>
<td>RC</td>
<td>0.926</td>
<td>0.928</td>
<td>0.944</td>
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<td>SC</td>
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<td>0.951</td>
<td>0.960</td>
<td>0.799</td>
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<tr>
<td>TC</td>
<td>0.923</td>
<td>0.925</td>
<td>0.945</td>
<td>0.813</td>
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<tr>
<td>UTI</td>
<td>0.951</td>
<td>0.953</td>
<td>0.960</td>
<td>0.773</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The next step in PLS-SEM is the structural model estimation. This step involves drawing structural paths between the constructs. To represent structural relationship (hypothesized) between the constructs, only a single-headed arrow was used. Structural model was then analyzed through observing the structural path between dependent, independent and the moderating constructs. The model also explains the relation existing between the latent constructs. Whereas, the measurement model explains the occurrence of association among the constructs and their indicating variables (i.e. the outer model). Structural model also determines the direct as well as indirect effects of the involved variables. Following is the structural model of this study (Figure 3):

![Structural model](image_url)

**Table 4. Direct Relationship**

|                        | Original Sample (O) | Sample Mean | SD  | T Statistics (|O/STDEV|) | P-Value |
|------------------------|---------------------|-------------|-----|---------------------|---------|
| OC -> BS               | 0.062               | 0.062       | 0.172 | 3.360               | 0.000   |
| OC -> UTI              | 0.103               | 0.106       | 0.066 | 3.552               | 0.000   |
| PC -> BS               | 0.105               | 0.102       | 0.121 | 3.870               | 0.000   |
| PC -> UTI              | 0.324               | 0.322       | 0.075 | 4.299               | 0.000   |
| RC -> BS               | 0.247               | 0.250       | 0.168 | 3.470               | 0.000   |
| RC -> UTI              | 0.099               | 0.099       | 0.096 | 3.027               | 0.000   |
| SC -> BS               | 0.039               | 0.037       | 0.136 | 3.285               | 0.000   |
| SC -> UTI              | -0.079              | -0.074      | 0.092 | 3.854               | 0.000   |
| TC -> BS               | 0.333               | 0.336       | 0.127 | 3.616               | 0.009   |
| TC -> UTI              | 0.535               | 0.530       | 0.078 | 3.872               | 0.000   |
| UTI -> BS              | 0.198               | 0.212       | 0.189 | 4.049               | 0.000   |
Table 5. Indirect Relationship

| Original Sample (O) | Sample Mean (M) | SD       | T Statistics (|O/STDEV|) | P Values |
|---------------------|-----------------|----------|----------------|--------------|---------|
| OC -> UTI -> BS     | 0.020           | 0.020    | 0.025          | 0.816        | 0.000   |
| PC -> UTI -> BS     | 0.064           | 0.067    | 0.063          | 1.023        | 0.000   |
| RC -> UTI -> BS     | 0.020           | 0.024    | 0.035          | 0.552        | 0.000   |
| SC -> UTI -> BS     | -0.016          | -0.019   | 0.031          | 0.506        | 0.000   |
| TC -> UTI -> BS     | 0.106           | 0.115    | 0.106          | 1.000        | 0.000   |

Afterwards, the study estimated the mediation level, to determine any indirect effects. For assessing the relationship significance, bootstrapping analysis was carried out with 1000 sample observations. The p-value is significant at 5%; all hypotheses exhibited significant results are 5% level of significance, therefore, representing the acceptance of all hypotheses. In addition, the study also found the moderating role of customer response in the relationship between external supply chain performance and agile supply chain, as presented in Table 4 and Table 5. Mediation results have shown significant values for t (t >1.96) and p (p <0.05), thus accepting the H3 hypotheses.

Table 6. R-Square

<table>
<thead>
<tr>
<th></th>
<th>R Square</th>
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<tbody>
<tr>
<td>BS</td>
<td>0.522</td>
</tr>
<tr>
<td>UTI</td>
<td>0.873</td>
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</tbody>
</table>

Finally, the predictive power of the variables is observed by estimating the coefficient of determination (R²). The R² for this research is 52%, which is the moderate level, therefore, indicating that 52 percent variation in dependent variable is explained by the independent variables (Table 6). Range of R² is 0-1, where 0 represent no predictive accuracy and 1 represents greater or substantial predictive power.

Conclusion

Every business in this world is born out of entrepreneurship. Entrepreneurship has been the sprouting ground for various discoveries, inventions, innovations, products and processes and is source and engine of economic growth. From the context of this study, a sound conclusion can be drawn with emphasis that IT has a great influence on productivity in the entrepreneurship. Hence, Information Technology has influence to make changes in process and productivity which in turn boost profitability and success. In the same vein, the use of Information Technology in entrepreneurship opens up new opportunities, reduces inventories with the use of Information Technology as well as makes services more tradable (Brüderl, J., & Preisendörfer, P. 1998). Furthermore, Information Technology has the potential to improve the core business in every step of business process, through the use of information technology in entrepreneurship can gain from developing capabilities for managing information, intensive resources, reduced transaction costs, develop capacity for information gathering and dissemination of international scale and gain access to rapid flow of information. In addition, entrepreneur in SMEs sector is a very important character who has the strength to boost the economy of a country. The conducive milieu created for innovate which can optimize the performance of the business. Entrepreneurship is a concept which is not detachable from the concept of innovation. Innovation is not coming free but its origins at human mind with the aid of knowledge absorbed from the environment. Business innovation can be categorized to four basic concepts according to literature namely; product, process, market and organizational innovations. Innovation refers a newness which can be radical or incremental. Mentioned innovations may differentiate one organization from another. That difference may attract the customers for the innovative organization. Further these innovations may support entrepreneurs to identify unseen markets, develop new processes and introduce new organizational structure to adapt those processes and to develop quality products with low cost to win competition.
References


Olatunji, O. S. (2015). The impact of information communication technology on small and medium scale enterprises productivity in Nigeria.


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IMPACT OF MACROECONOMIC INDICATORS ON DEVELOPMENT PATTERNS:
CASE OF TOURISM INDUSTRY IN ASEAN REGION

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Abstract. The purpose of this research is to examine the impact of macroeconomic indicators on tourism revenue from five states of ASEAN region. To address this objective secondary data is collected over last 18 years from 2001-2017 with annual observations. Macroeconomic indicators include inflation, oil prices, industrial growth, exchange rate stock market index, and gross domestic product over time. Method of the study is based on regression OLS estimation with robust standard errors. Empirical findings indicates that key determinants for the change in tourism revenue in selected countries are exchange rate, stock market index, inflation and industrial growth. However, impact of GDP on tourism revenue is also significant for Malaysia, Indonesia, and Brunei. Study findings can be very much beneficial for present decision-making regarding growth in tourism industry in ASEAN region. Limitations of the study includes less than 20 years of time duration, ignoring the microeconomic indicators of tourism revenue and cross-sectional analysis. Future studies can address these limitations which better understanding and practical implications.

Keywords: tourism revenue, inflation, GDP, stock market index, industrial growth, ASEAN.


JEL Classifications: L83, P24, J53

1. Introduction and Background of the Study

For the world trade and prosperity tourism is one of the key driver (World Tourism Organization, 2019; Hossain et al, 2018; Islam et al, 2018; Kabir et al, 2018; Chkalova et al., 2019; Shevyakova et al., 2019). Importantly, over the time ASEAN tourism industry has grown. According to the World travel and tourism council (2017) they mentioned that overall 7.6 trillion US$ has generated revenue from travel and tourism which is 10.2% of overall global GDP. In addition, ASEAN countries are providing equal promotion of all their region destination to develop more sustainable. Therefore, tourism and travel considered as one of key contributor for generating revenue. In terms of revenue generation tourism industry has significance impact in the economy for future continuous growth. Therefore, effects of macroeconomic variables are true extent for tourism revenue.

Presently, Ordinary least square regression and quantile regression are not yet used to predict the effect of macroeconomic variables on tourism revenue of ASEAN countries. All number of countries in ASEAN community are considered equally intention to identify the relationship of macroeconomic variables. Additionally, the growth of tourism industry is found in all regions who are providing more safety and healthy facilities to tourists (Mahrinasari et al. 2019).
ASEAN countries association are being held in 1967 in Thailand with initial five countries member. For instance, Malaysia, Singapore, Indonesia, Philippines, Thailand and Malaysia. Thereafter, additional countries join ASEAN community such as Vietnam, Brunei Darussalam, Myanmar, Laos and Cambodia. They caption the motto of “One vision, one identity and one community”. These joint communities are tending to generate quality opportunities after collaboration with the basic pillars. These three pillars are named as Economic community, political security community and socio-cultural community. According to ASEAN Tourism Agreement (2015) they reported 13 articles regarding sustainability goals in terms of social progress, culture development, training for enhancing skills, collaboration for living better standards to provide organization cooperation with international region.

2. Overview of Tourism Industry in ASEAN

From the context of tourism industry, a strategic plan is developed by ASEAN member for the time period of 2016 to 2025. It is believed that tourism industry in ASEAN member is playing its vital role for the economic growth and financial progress. For this purpose, all member states have consolidated their services in terms of quality of services to the tourists, marketing, human resource development, investment in mega projects, participation from the local community, sustainable development and attracting more tourists in local market. Under this objective for 2025, the factor of promotion and marketing covers the enhancement of ASEAN tourism and statistical framework. To offer diversify products in tourism, activities under the title of complete and ongoing identification of new product development with marketing efforts have been defined. For the attracting tourism investment, plan is developed which coordinates the convergence and investment for the tourism infrastructure. For raising capability and capacity in the field of tourism, mutual recognition is conducted for the professional development. While for the enhancement of facilities, overall agreement between ASEAN countries is developed under the title of “article 2 of ASEAN Tourism Agreement 2002”.

Following are the core highlights under the tourism plan of 2025:

- The member states will contribute towards the GDP through more tourism up to 12 to 15 %.
- The share of employment in tourism industry could increase from 3 to 7 %.
- Spending in terms of per capita by those who are visiting these member states will increase from 877 US dollars to approximately 1500 US dollars.
- The activity of community-based tourism could increase from 43 to more than 300.

After the review of tourism industry in ASEAN, since 2001 to 2014, total number of tourists from international market has been increased to 105 million in 2014, which are 42 million back in year 2001. This significant increase indicates the fact that huge amount of revenue is coming towards these countries, providing more growth opportunities and financial outcomes. While in depth analysis of this arrival indicates the fact that 12 percent arrival is from Europe, more than 30 percent from Asia, while 46 percent of tourists were coming from Intra ASEAN. In addition, 4 percent are those who belongs to America and 4 percent also from Oceania. In addition, rest of the 4 percent from total tourists are not specified very well. Figure 2 provides a comprehensive view of this trend during 2014 (Secretariat, 2016; Keho, 2017; Khan, 2018; Lari et al, 2017). The forecasting of international arrivals to ASEAN is also presented under the below findings, which covers there region; world, Asia & pacific, and southeast Asia. It is believed that 2010-2020 3.8 percent tourists are coming from world economy, while specifically 5.7 percent are coming from Asia & Pacific and 5.8 percent from Southeast Asia (Secretariat, 2015). (Figure 1).
Based on above overview, this study has been conducted for the tourism revenue in ASEAN from the context of macroeconomic indicators. After the detailed review of literature, it is found that earlier studies are missing with the context of ASEAN and majority of focus is towards the Europe and other developed countries having significant tourism market. However, the focus towards ASEAN specifically from the context of macroeconomic determinants and tourism industry is missing. In this context, this study will reasonably be covering the literature gap, both theoretically and practically. The rest of the study is as follows. Next section has provided critical review of the literature for tourism industry and macroeconomic indicators in different regions. Section three explains variables, their operational significance with literature evidence. Section four indicates the methods being applied in the study. Section five shows results and their valuable discussion for the association between variables. Last section gives conclusions, limitations and some future directions.

3. Related Literature

In the developed countries, international arrivals of tourist affecting factors has been study extensively. However, according to the tourist arrivals report of 2010-15 shows the five-year tourist arrivals continuous increased trend. In this regard, such studies yet not carried to explore the relationship of macroeconomic indicators and revenue of tourism among ASEAN countries. More importantly, in previous studies seasonal analysis based on each year has been abandoned. Therefore, this study bring more extensive in nature to explore influencing macroeconomic factors.

Various studies argued that arrival of tourism is better explained by income because it shows the detailed earning of tourism sector (Croes & Vanegas Sr, 2005; Jang, Bai, Hong, & O’Leary, 2004; Wang, 2009; Wattanakuljarus & Coxhead, 2008). It is further added that higher income are bigger spender then lower income. According to Jang et al. (2004) who argued that in USA Japanese young educated travelers are more interested to visit comparatively to other developed countries. Algieri (2006) explains key indicators of Russian tourism, for instance gross domestic product (GDP) had found positive significant long run cointegration association. He further explained that intense demand of foreigner travelers are more concern to luxurious and good services which tends to increase in the income level of tourism. In contrary, Dritsakis (2004) used vector error correction approach to determine relationship of macroeconomic factor on Greece industry.

This study concluded that higher income in Great Brittan and Germany are leading due to attractive macroeconomic factors. In another study of Lim, Min, and McAleer (2008) who used ARIX model to express the influence of income change of New Zealand from Japanese arrivals. It is argued that origin country income level is associated from tourist arrival factors. This study is concerning to use industrial production index (IPI) due to lack of monthly data of GDP because in previous there are very few studies who mentioned the importance of industrial production index for tourism demand. In Jeju Island, Singapore, Thailand, and Philippines has correlational demand which is statistically proved through using VEC industrial production (Seo, Park, & Yu, 2009). Thereafter, another important macroeconomic factor is exchange rate. There is a rich literature of exchange rate that influence tourism demand in past studies. According to the Box and Cox (1964) and Croes and Vanegas Sr (2005) who used appropriate functional method (linear equation and log linear) to determine the influence of tourism demand through exchange rate fluctuation. They revealed from the result that exchange rate is most vital element for travelers of Venezuelan and Aruba. Similarly, Seo et al. (2009) explains through VEC model that

<table>
<thead>
<tr>
<th>Region</th>
<th>Projected Growth in Arrivals</th>
<th>Actual</th>
<th>Projections</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2010-2020</td>
<td>2013</td>
<td>2020</td>
</tr>
<tr>
<td>World</td>
<td>3.8%</td>
<td>1,087</td>
<td>1,360</td>
</tr>
<tr>
<td>Asia and Pacific</td>
<td>5.7%</td>
<td>248</td>
<td>355</td>
</tr>
<tr>
<td>Southeast Asia</td>
<td>5.8%</td>
<td>102*</td>
<td>123</td>
</tr>
</tbody>
</table>

Figure 1. Forecasting of international arrivals to ASEAN

Source: Secretariat (2015)
exchange rate is influencing factor for raising demand of tourist of Thailand, Philippines and Jeju island. They further added that tourist of South Korean are easing to visit Philippines when real exchange rate is at minimum level. However, exchange rate is noteworthy explanatory variables to influence tourist demand (Algieri, 2006; Hiemstra & Wong, 2002; Saayman & Saayman, 2008; Wang, 2009; Hussain et al., 2018). In previous studies, inflation is not much exploring to determine true determinants of tourism revenue. According to (Chen, 2007a) and (Chen, 2007b) who argued that in hotel stock return of china has association with macro and non-macro factors. Regarding stock index and crude oil has proposed to influence the tourist demand in ASEAN countries because besides higher income group there are lower- and middle-income group are also visiting tourist destination. Therefore, higher crude oil price has influence on tourist demand. According to Saayman and Saayman (2008) who used travel cost as proxy of crude oil price to determined tourist demand but this study is extend to use variation of crude oil price to determine appropriate result to generate demands of tourist by local and foreign travelers.

In addition. Some other studies have explored the relationship between macroeconomic factors and tourism industry. For instance, (Meo, Chowdhury, Shaikh, Ali, & Masood Sheikh, 2018) have examined the impact of change in oil prices, exchange rate for the demand in tourism industry of Pakistan. For this purpose, they have applied ARDL approach with the cointegration method. Findings of their study reveals the fact that there is a significant effect of CO2 emission on the value of tourism demand in Pakistan. While other factors like quality of institution have shown their long run association with the prices of oil, inflation, changes in exchange rate for tourism demand. In addition, some others like (Buckley, Gretzel, Scott, Weaver, & Becken, 2015) explored the relationship between the facility of local infrastructure in the form of transportation on the value of tourism industry. He explained that increase in the oil prices have their significant and adverse influence on the tourism demand in local market. The study of (Katircioglu, Katircioglu, & Altun, 2018) explained that changes in the oil price is associated to the economic growth and both demand and supply forces in the economy. They have explained that supply side is directed effected due to more production cost, while demand side is affected as well. It is also believed that tourism industry can also create the income inequality and can affect the Kuznets curve hypothesis (Alam & Paramati, 2016).

Becken (2011) has explained the relationship between oil and global tourism industry. It is believed that oil price is linked to world economy and in similar way to the tourism too. To analyze this objective, author has explored the economy of New Zealand under the situation of dwindling of global oil. Study was based on the four different research phases. Their finding indicates the fact that significant association between tourism industry and oil price in the world economy exists. (Blomberg, Hess, & Jackson, 2009) also consider the factor of oil price and its association with the tourism. (Gunter, 2018; Lechner et al, 2018; Habib & Mucha Sr, 2018; Madhusudhanan, 2018) examines the conditional forecasting for the export of tourism and tourism export prices in the region of EU 15-member states under the title of global vector autoregression method. Time duration of the study was 2013 to 2017. Findings through GVAR explains that global tourist income is relative associated to the price ensurity. Practical implication of the study reveals that global market share is rising in competition. The detailed investigation and critical review of present literature shows that regional economic indicators are directly or indirectly affecting the tourism industry in different economies. However, the studies from the context of south Asian and ASEAN members are very limited. Notable work can be viewed in the studies of (Hall, 1992; Hall & Page, 2012; Hitchcock, King, & Parnwell, 2018; Richter, 1989; Wong, Mistilis, & Dwyer, 2011; Moussa, 2018). The focus of these studies is based on the review of tourism sector through intergovernmental collaboration, super nationalist’s alliance, economic impacts, economic development, and under the title of pre-conditions and framework for the policy development as well. In this regard, intergovernmental coordination is found to be very much significant and persistent. To the best of authors findings, this study is very first attempt to explore the idea of tourism revenue in targeted economies through regional economic indicators.

4. Description of Variables

Table 1 provides the description of variables through their operational abbreviation, operational definition and literature source.
Table 1. Definition of Variables

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Operational Abbreviation</th>
<th>Operational Definition</th>
<th>Source of Literature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tourism Revenue</td>
<td>TOURISMSREVENUE</td>
<td>Indicates overall earnings from tourism industry in a year</td>
<td>(Archabald &amp; Naughton-Treves, 2001; Sandbrook, 2010; Vijaya, 2010)</td>
</tr>
<tr>
<td>Inflation</td>
<td>INFLATION</td>
<td>Gradual increase in the prices of goods and services in the country</td>
<td>(Fama &amp; Schwert, 1977; Gali &amp; Gertler, 1999)</td>
</tr>
<tr>
<td>Oil Price</td>
<td>OILPRICE</td>
<td>Annual price of oil in the country</td>
<td>(Perron, 1989; Sadorsky, 1999)</td>
</tr>
<tr>
<td>Exchange Rate</td>
<td>ER</td>
<td>Annual effective exchange rate per US dollar</td>
<td>(De Grauwe &amp; Grimaldi, 2018; Gabaix &amp; Maggiori, 2015)</td>
</tr>
<tr>
<td>Stock Market Index</td>
<td>SMIND</td>
<td>Covers the measurement of section of stock, measured through selected prices and weighted average.</td>
<td>(Moghaddam, Moghaddam, &amp; Esfandyari, 2016; Patel, Shah, Thakkar, &amp; Kotecha, 2015)</td>
</tr>
<tr>
<td>Industrial Growth</td>
<td>IGR</td>
<td>Annual growth rate in overall industry of a country</td>
<td>(Barnett, 2016; Oakey &amp; Rothwell, 2018)</td>
</tr>
</tbody>
</table>

5. Research Methodology

This study has used secondary data from five economies in ASEAN region. For this purpose, data is collected over last five years for macroeconomic indicators are tourism revenue in selected countries. After the collection of data, regression analysis approach is applied under separate econometric equations, covering the causal relationship between the independent and dependent variables of the study. For better understanding of applied methodology, following equations will help the reader to understand the predicted relationship between variables. Each equation presents separate regions, covering both IVs and DVs, while coefficients are abbreviated under the title of $B_0, B_1, B_2$ up to $B_n$. In addition, error terms are covered under the title of $\epsilon$. Each equation indicates separate region for the tourism receipt and its core determinants from their economy. Equation 1 is for the economy of Malaysia, equation 2 for the Indonesia, equation three for Thailand, equation four for Singapore, and equation five considers for the economy of Brunei. Relationship under these equations is tested through STATA-14 version, while adjusting the standard errors in the coefficients through robust command.

Tourism Receipt (Malaysia) = $B0 + b1(\text{Inflation}) + b2(\text{oil prices}) + b3(\text{exchange rate: ER}) + b4(\text{stock market index: SMIND}) + b5(\text{industrial growth: IGR}) + b6(\text{GDP}) + \epsilon$

Equation 1

Tourism Receipt (Indonesia) = $B0 + b1(\text{Inflation}) + b2(\text{oil prices}) + b3(\text{exchange rate: ER}) + b4(\text{stock market index: SMIND}) + b5(\text{industrial growth: IGR}) + b6(\text{GDP}) + \epsilon$

Equation 2

Tourism Receipt (Thailand) = $B0 + b1(\text{Inflation}) + b2(\text{oil prices}) + b3(\text{exchange rate: ER}) + b4(\text{stock market index: SMIND}) + b5(\text{industrial growth: IGR}) + b6(\text{GDP}) + \epsilon$

Equation 3

Tourism Receipt (Singapore) = $B0 + b1(\text{Inflation}) + b2(\text{oil prices}) + b3(\text{exchange rate: ER}) + b4(\text{stock market index: SMIND}) + b5(\text{industrial growth: IGR}) + b6(\text{GDP}) + \epsilon$

Equation 4
Tourism Receipt (Brunei) = B0 + b1(Inflation) + b2(oil prices) + b3(exchange rate: ER) + b4(stock market index: SMIND) + b5(industrial growth: IGR) + b6(GDP) + €

Equation 5

6. Results and Discussion

For the effect of macroeconomic indicators on tourism revenue in Malaysia, Table 2 provides statistical findings. For regional economic factors, inflation, price of oil, exchange rate, stock market index, industrial growth rate and gross domestic product are added in the model. Through inflation, effect on tourism revenue is Malaysia, it has significant negative influence. It means that more increase in the prices of goods and services are local level is leading towards adversely affecting the revenue from the tourism industry. This effect is significant at 1 percent level of significance. While effect of oil prices in the local market has indicates its negative but insignificant impact on tourism revenue of Malaysia. While exchange rate is found to be significant determinant of tourism revenue, showing the coefficient of -.058 and standard error of .164 respectively. Through stock market index, industrial growth both indicators have shown their insignificant association with the level of tourism revenue. But the effect through GDP is found to be positively significant with the coefficient of .227, standard error of .042 and t-value of 10.31 as well. F-test shows significant of the model while R-square indicates an explanatory power of .463 for the region of Malaysia.

Table 2. Tourism revenue and macroeconomic determinants: Malaysia

<table>
<thead>
<tr>
<th>TOURISMREVENUE</th>
<th>Coef.</th>
<th>St.Err</th>
<th>t-value</th>
<th>p-value</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>INFLATION</td>
<td>-0.393</td>
<td>0.038</td>
<td>-1034</td>
<td>0.000</td>
<td>***</td>
</tr>
<tr>
<td>OILPRICE</td>
<td>-0.070</td>
<td>0.047</td>
<td>-1.49</td>
<td>0.165</td>
<td></td>
</tr>
<tr>
<td>ER</td>
<td>-0.286</td>
<td>0.164</td>
<td>-1.75</td>
<td>0.109</td>
<td>*</td>
</tr>
<tr>
<td>SMIND</td>
<td>-0.058</td>
<td>0.164</td>
<td>-0.18</td>
<td>0.860</td>
<td></td>
</tr>
<tr>
<td>IGR</td>
<td>-0.142</td>
<td>0.122</td>
<td>-1.17</td>
<td>0.267</td>
<td></td>
</tr>
<tr>
<td>GDP</td>
<td>0.227</td>
<td>0.042</td>
<td>10.31</td>
<td>0.000</td>
<td>***</td>
</tr>
<tr>
<td>_CONS</td>
<td>-1.644</td>
<td>1.236</td>
<td>-1.33</td>
<td>0.210</td>
<td></td>
</tr>
</tbody>
</table>

Mean dependent var | 0.134 | SD dependent var | 0.288
R-squared          | 0.463 | Number of obs    | 18.000
F-test             | 4.581 | Prob > F          | 0.021
Akaike crit. (AIC) | 8.082 | Bayesian crit. (BIC) | 14.314

*** p<0.01, ** p<0.05, * p<0.1

Table 3 indicates regression findings for tourism revenue and macroeconomic determinants in the region of Indonesia. Through oil price, effect on tourism revenue is found to be significant and negative at 1 percent chance of error. It means that more oil prices in Indonesia has their adverse influence on revenue from tourism. For exchange rate, effect on tourism revenue is found to be positively significant at 1 percent chance of error. While stock market index also shows its no influence on tourism revenue. Through GDP, coefficient of .1024 explains that increasing gross domestic products have their positive influence on tourism revenue in Indonesia. The determination of tourism revenue through macroeconomic variables on tourism industry is significant as F-test has a score of 94.648, with p-value of .000. While explained variation in Dependent variable is .812 shows a good variation in tourism revenue by targeted macroeconomic indicators.

Table 4 specifies regression findings for tourism revenue and macroeconomic determinants in the Thailand. It
is observed that effect of oil price on tourism revenue is found to be significant and positive at 5 percent chance of error. It means that more oil prices in Thailand is showing their direct impact on revenue from tourism. For exchange rate, effect on tourism revenue is found to be negative but insignificant at 1, 5 and 10 percent chance of error. While stock market index also shows its positive and significant influence on tourism revenue with the coefficient of .585. Through GDP, coefficient of .029 explains that increasing gross domestic products have their positive but insignificant influence on tourism revenue in Thailand. In addition, F-test has a score of 9.233, with p-value of .000, significant at 1 percent. While explained variation in Dependent variable is .787 due to all macroeconomic regional indicators.

Table 3. Tourism revenue and macroeconomic determinants: Indonesia

<table>
<thead>
<tr>
<th>TOURISMREVENUE</th>
<th>Coef.</th>
<th>St.Err</th>
<th>t-value</th>
<th>p-value</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>INFLATION</td>
<td>0.042</td>
<td>0.040</td>
<td>1.05</td>
<td>0.319</td>
<td></td>
</tr>
<tr>
<td>OILPRICE</td>
<td>-0.040</td>
<td>0.019</td>
<td>-2.08</td>
<td>0.067</td>
<td>*</td>
</tr>
<tr>
<td>ER</td>
<td>4.510</td>
<td>0.311</td>
<td>14.51</td>
<td>0.000</td>
<td>***</td>
</tr>
<tr>
<td>SMIND</td>
<td>-0.077</td>
<td>0.044</td>
<td>-1.77</td>
<td>0.111</td>
<td></td>
</tr>
<tr>
<td>IGR</td>
<td>0.007</td>
<td>0.002</td>
<td>3.57</td>
<td>0.006</td>
<td>***</td>
</tr>
<tr>
<td>GDP</td>
<td>0.1024</td>
<td>0.0142</td>
<td>7.21</td>
<td>0.000</td>
<td>***</td>
</tr>
<tr>
<td>_cons</td>
<td>0.333</td>
<td>0.159</td>
<td>2.09</td>
<td>0.066</td>
<td>*</td>
</tr>
</tbody>
</table>

Mean dependent var 0.133
SD dependent var 0.196
R-squared 0.812
Number of obs 16.000
F-test 94.648
Prob > F 0.000
Akaike crit. (AIC) -55.139
Bayesian crit. (BIC) -50.891

*** p<0.01, ** p<0.05, * p<0.1

Table 4. Tourism revenue and macroeconomic determinants: Thailand

<table>
<thead>
<tr>
<th>TOURISMREVENUE</th>
<th>Coef.</th>
<th>St.Err</th>
<th>t-value</th>
<th>p-value</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>INFLATION</td>
<td>-0.028</td>
<td>0.023</td>
<td>-1.22</td>
<td>0.242</td>
<td></td>
</tr>
<tr>
<td>OILPRICE</td>
<td>0.060</td>
<td>0.024</td>
<td>2.53</td>
<td>0.023</td>
<td>**</td>
</tr>
<tr>
<td>ER</td>
<td>-0.027</td>
<td>0.027</td>
<td>-1.01</td>
<td>0.330</td>
<td></td>
</tr>
<tr>
<td>SMIND</td>
<td>0.585</td>
<td>0.173</td>
<td>3.38</td>
<td>0.004</td>
<td>***</td>
</tr>
<tr>
<td>IGR</td>
<td>-0.007</td>
<td>0.003</td>
<td>-2.18</td>
<td>0.045</td>
<td>**</td>
</tr>
<tr>
<td>GDP</td>
<td>0.029</td>
<td>0.018</td>
<td>1.65</td>
<td>0.120</td>
<td></td>
</tr>
<tr>
<td>_cons</td>
<td>-0.182</td>
<td>0.138</td>
<td>-1.31</td>
<td>0.208</td>
<td></td>
</tr>
</tbody>
</table>

Mean dependent var 0.062
SD dependent var 0.067
R-squared 0.787
Number of obs 18.000
F-test 9.233
Prob > F 0.000
Akaike crit. (AIC) -77.737
Bayesian crit. (BIC) -70.100

*** p<0.01, ** p<0.05, * p<0.1

Table 5 shows the effect of macroeconomic variables on tourism revenue in Singapore. It is found that inflation, oil price and exchange rates has no direct influence on the receipt from tourism. While stock market index, and industrial growth has shown their positive and significant impact with the coefficients of 1.458 and .081. It means that more receipt of tourism industry is possible with the factors like stock market index and overall industrial growth in the economy. While effect through GDP is found to be insignificant on tourism revenue in the region of Singapore.
Table 5. Tourism revenue and macroeconomic determinants: Singapore

<table>
<thead>
<tr>
<th>TOURISMREVENUE</th>
<th>Coef.</th>
<th>St.Err</th>
<th>t-value</th>
<th>p-value</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>INFLATION</td>
<td>-0.007</td>
<td>0.013</td>
<td>-0.53</td>
<td>0.603</td>
<td></td>
</tr>
<tr>
<td>OILPRICE</td>
<td>0.003</td>
<td>0.010</td>
<td>0.35</td>
<td>0.730</td>
<td></td>
</tr>
<tr>
<td>ER</td>
<td>-0.006</td>
<td>0.009</td>
<td>-0.67</td>
<td>0.512</td>
<td></td>
</tr>
<tr>
<td>SMIND</td>
<td>1.458</td>
<td>0.067</td>
<td>21.80</td>
<td>0.000</td>
<td>***</td>
</tr>
<tr>
<td>IGR</td>
<td>0.081</td>
<td>0.004</td>
<td>2.13</td>
<td>0.051</td>
<td>*</td>
</tr>
<tr>
<td>GDP</td>
<td>-0.006</td>
<td>0.011</td>
<td>-0.50</td>
<td>0.623</td>
<td></td>
</tr>
<tr>
<td>_cons</td>
<td>0.019</td>
<td>0.093</td>
<td>0.21</td>
<td>0.839</td>
<td></td>
</tr>
</tbody>
</table>

Mean dependent var 0.040 SD dependent var 0.113
R-squared 0.975 Number of obs 18.000
F-test 96.340 Prob > F 0.000
Akaike crit. (AIC) -101.266 Bayesian crit. (BIC) -93.629

*** p<0.01, ** p<0.05, * p<0.1

For tourism revenue in the region of Brunei, Table 6 reflects the effect of macroeconomic indicators. It is found that inflation and oil price found to be insignificant determinants of tourism revenue. While exchange rate has shown a negative and significant effect of -.012 in Brunei. It means that more volatility in exchange rate causing to an opposite effect on tourism income. While through stock market index effect is significantly positive with the coefficient of .154 and standard error of .018 respectively. Additionally, both industrial growth and GDP are found to be significant affecting the tourism receipt.

Table 6. Tourism revenue and macroeconomic determinants: Brunei

<table>
<thead>
<tr>
<th>TOURISMREVENUE</th>
<th>Coef.</th>
<th>St.Err</th>
<th>t-value</th>
<th>p-value</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>INFLATION</td>
<td>0.012</td>
<td>0.017</td>
<td>0.71</td>
<td>0.486</td>
<td></td>
</tr>
<tr>
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<td>0.002</td>
<td>0.55</td>
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<tr>
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<td>0.002</td>
<td>6.024</td>
<td>0.000</td>
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<tr>
<td>SMIND</td>
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<td>0.018</td>
<td>8.58</td>
<td>0.000</td>
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<tr>
<td>IGR</td>
<td>0.011</td>
<td>0.008</td>
<td>1.46</td>
<td>0.163</td>
<td></td>
</tr>
<tr>
<td>GDP</td>
<td>0.033</td>
<td>0.017</td>
<td>2.00</td>
<td>0.063</td>
<td>*</td>
</tr>
<tr>
<td>_cons</td>
<td>-0.279</td>
<td>0.147</td>
<td>-1.90</td>
<td>0.076</td>
<td>*</td>
</tr>
</tbody>
</table>

Mean dependent var -0.001 SD dependent var 0.071
R-squared 0.901 Number of obs 18.000
F-test 24.220 Prob > F 0.000
Akaike crit. (AIC) -96.564 Bayesian crit. (BIC) -88.615

*** p<0.01, ** p<0.05, * p<0.1

7. Conclusions and Future Directions

This study has examined the effect of macroeconomic factors on tourism revenue in five ASEAN countries. For this purpose, study has conducted OLS regression analysis technique for all five states. It is observed that in the region of Malaysia, regional economic indicators like Inflation, exchange rate changes, and gross domestic product have their significant impact on the income from tourism industry over last 18 years of the study. In case of Indonesia, key indicators from the macroeconomic environment for tourism revenue are found to be
oil prices, exchange rate, industrial growth and gross domestic products. Regression findings for the region of Thailand has shown that key factors to affect tourism income are oil price, stock market index, and industrial growth with good explanatory power of the model. Empirical findings for Singapore suggested that there is a significant need to focus on the factors like stock market index, and industrial growth having their direct influence for increasing value of tourism revenue in the country. While in case of Brunei, it is found that key determinants are exchange rate, industrial growth and gross domestic product along with stock market index. Bases on these findings, this study is highly recommended to the researchers, academics and policy makers at regional level who are analyzing the relationship between tourism industry and its key determinants at macrolevel. Study findings can be very much beneficial for present decision-making regarding growth in tourism industry in ASEAN region. Additionally, students in the field of economics and business management can review the causal relationship between the key variables of this study. However, this study has several limitations. At first study is just focusing on the macroeconomic factors, while ignoring micro indicators. At second, sample period is less than 20 years which assumes to be not very good for the long run analysis. At third, cross sectional and comparative analysis of selected states is missing in this study. Future work should address these limitations for better findings and more appropriate managerial implications.

References


Archabald, K., & Naughton-Treves, L. (2001). Tourism revenue-sharing around national parks in Western Uganda: early efforts to identify and reward local communities. Environmental conservation, 28(2), 135-149. Available at: https://doi.org/10.1017/s0376892901000145

ASEAN Tourism Agreement. (2015). ASEAN Tourism Agreement,. from https://asean.org/?static_post=asean-tourism-agreement


Wang, Y.-S. (2009). The impact of crisis events and macroeconomic activity on Taiwan’s international inbound tourism demand. Tourism Management, 30(1), 75-82. Available at: https://doi.org/10.1016/j.tourman.2008.04.010


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Open Access
IMPACT OF SAFETY CONCERNS ON A LIFESTYLE

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Abstract. The main purpose of this research paper is too aware the people of Malaysia that how organic foods is beneficial and healthy compare to the traditional foods. Furthermore, the reason behind the research conducted in Malaysia was to discover the overall concept of Halal Foods. Mainly, the entire research paper evolves around the benefits of organic foods and its consumption. The most pertinent element is the healthy content and after that friendly environment strategies. Data were collected using a web-based survey to recruit participants from pools of consumer panels registered with a market research company. The technique which is used in this research is sampling technique. This study was limited as it was conducted only in the Malaysian city Kuala Lumpur, with the small sample size of 350 as well as the questionnaires was only comprising of close-ended questions of which the chances of inaccuracy is maximum. However, for future research the researcher should increase the sample size which represents the overall Malaysia by collecting the data from each region of Malaysia. Furthermore, the data collection should be done with the help of open-ended questions to reduce the inefficiency and inaccuracy of the study, more variables can also be counted in for evaluate the purchase intentions of the consumers.

Keywords: organic foods; consumption; foods; Hedonic consumption


JEL Classifications: L66, D16

1. Introduction

Healthy and safe food is a basic requirement of every human being. Paul & Rana (2012) interrogated the consumer buying behavior in the framework of organic food consumption. This study reveals the fact that the consumer satisfaction and positive attitude towards the organic food is comprised of many important components. The most pertinent element is the healthy content. Primarily, quality of the food also satisfies the consumer mostly. Squires et al. (2001) investigated the organic food roles in New Zealand and Danish. The study found that the high price of the organic food is the obstacle for the Bangladeshi people in consuming organic food. Another major obstacle in approaching organic food is its unavailability. The result reveals that the food with organic label on it evokes the estimations that the food is low caloric. It also demonstrates that the label of organic foods is helpful for the retailers and manufactures that they are able to attract the customers towards organic foods because of its benefits.

Furthermore, Kareklas et al. (2014) interrogated the factors which emphasize a person to consume organic food. The study depicted that the organic foods has its own value among people. However, the nutritional content of the food and the environmental safety is the most important elements which people look after before consuming organic foods. Moreover, Gracia et al. (2014) analyzed the vigorous impact of diet and health labels on the consumer satisfaction, because the consumer is willing to purchase organic food for the sake of maximum satisfaction and maximum health safety. Results indicated that the hedonic attitude is satisfied by the
diet labels without influencing the utilitarian attitudes towards healthy foods. It emphasizes on the importance of labels in food category. Moreover, consumer loyalty and attitudes are also a very essential element which predicts the human satisfaction level (Haseeb et al. 2019). The study revealed that the concern for healthy and safe foods shapes the utilitarian attitude whereas, the ecological welfare is an influencer for hedonic attitude. It further elaborates that the consumer always pays for its health and safety which means that organic foods is worthy because of its health benefits (Lee & Goudeau, 2014; Myeni & Mvuyana, 2018; Nkiru et al, 2018; Nurulhuda et al, 2018; Faridi, M.F.; Sulphey, M. M. 2019).

Nevertheless, Auger et al. (2010) examine the corporate responsibilities of the people that people really care for it or not. The results indicate that the consumers are not well aware about the corporate behavior that either it is good or bad. If they admire the product, they are going to pay for it without paying attention to the corporate roles of the organization. Nevertheless, Harper & Makatouni (2002) investigated the consumer attitude and the productions effects on the farm animals. The final results indicate that the buying behavior of the consumers is composed of their values and perception. Consumer will pay for the products which are environmentally friendly and animal friendly and the product is not involved in violation of any ethical standards.

In the context of Malaysia, the awareness of the organic food and its benefits is at very low scale as compared to New Zealand and Danish, as it is the top producer of the organic foods in the world (Squires et al., 2001). In addition, this study is expected to aware people in Malaysia about the benefits of organic foods and its consumption. Because the people of Malaysia are more inclined towards traditional foods and are victimized of several diseases among which obesity is dominating. However, the importance of organic food is needed to be highlighted in Malaysian culture.

The main objective of this study is to aware Malaysian people about the benefits of the organic foods and how it is considered to be healthy as compared to the traditional foods. The purpose of conducting this research in the context of Malaysia is to explore the concept of Halal (legitimate) organic foods. The researches till now which investigated the organic food importance and influenced consumer behavior is done on all kinds of foods without Halal and Haram (illegitimate) concepts. But when it comes to the Malaysian contexts the only halal food consumption is allowed. Primarily, this study will be focusing the Halal organic foods consumption and its benefits. The entire study revolves around the importance of the organic foods and the attitude of the consumers. The most important factors of the study are the nutritional content, ecological welfare, natural content, sensory appeals and price and its influence on utilitarian and hedonic attitude which shapes the consumer purchase intention. Utilitarian attitude is the concern of safety and health needs whereas the hedonic attitude deals with the pleasure of consuming organic foods. Joshi & Rahman (2015) conducted the research in which the consumption of the organic food was examined and evaluated. The research was on all kinds of foods regardless they are legitimate and illegitimate.

The significance of this study is that it is focused solely towards the legitimate organic foods which are going to be very beneficial. Specifically, this study will emphasize towards healthy diet and unprocessed foods and will create awareness among the people through which they will be able to overcome on their unhealthy lives and will inclined towards healthy eating through which they will be able to secure their lives from contagious diseases which are basically the causes of unhealthy life and uses of traditional foods which are highly rich in calories and are lacking in proteins, calcium and important vitamins. This study will cover all of the nutritional aspects which will surely become a reason of better life among people. Lee & Yun (2015) interrogating the drastic gap between the attitudes and behavior and revealed that consumers compare the organic foods only with fruits and vegetables. They believe that organic food is only associated with fruits and vegetables whereas, the decision making is a complex behavior in order to purchase organic food or not. The values are associated with the decisions.
2. Literature Review

Nutritional Content:

Johansson et al. (2014) investigated the nutritional knowledge on food labels and its impact on consumer buying behavior. This study was conducted in three major retailers’ stores of United Kingdom. In addition, the nutritional awareness of the people was also examined in this study. About six product categories were studied in which 27% of those respondents were found who follow proper guidelines for daily amount. The statistical approach used in this research was regression analysis. The findings reflected that 28% of the shoppers pay attention to the nutritional knowledge mentioned on the food labels of the product. The study also revealed that the people are inclined towards healthy eating that’s why they analyze thoroughly the nutritional charts and then take decisions. However, health component is always a dominating factor among purchasing the organic foods. Because the people believe that organic products are hygienic and energetic foods. Health and nutrition’s are the most important determinant among college students while making purchase decisions (Dimitri & Dettmann, 2012; Obiunu & Rachael, 2018; Obodo, 2018; Obodo & Anigbata, 2018; Olufemi, 2018).

Similarly, Bekele et al. (2016) conducted a research to examine the importance and influence of nutritional labeling on purchase decision. However, the results indicate that females are more willing to pay attention towards nutrition label while purchasing. Furthermore, people with more available time are also considered to be health conscious and pay fully attention on it. Diet conscious and health conscious people are also found to be look for the nutritional label on the products. Meanwhile, Miller et al. (2015) conducted a research in which they analyzed the impact of food labels on beef, poultry and seafood consumptions. The study reveals that 70% of the consumers perceive food label very helpful while making purchase decision, and the remaining 30% found to be insufficient of food labels. Consequently, those people who found food labels as an important aspect are those who are more likely towards healthy and nutritious consumption and more frequent buyers of meat and other products as compare to those who found less focused on health and nutritional concerns.

H0: Nutritional content has the significant impact on the buying behavior of consumers of organic food.

Sensory Appeal:

Furthermore, Pham et al. (2019) interrogated the impact of diet and health labels on consumer taste and satiation. The study was conducted at the University of Illinois at Urbana Champaign. However, six weeks’ field experiment in the cafeteria of this university took place. The nature of the study is found to be qualitative and quantitative because the data collection was done through the experimental methods and the respondents were asked to fill in the questionnaires. Six low calorie desserts were selected and the entire study revolves around it. In addition, the collected data was analyzed with the help of statistical tools among which the P test analyzed played the most significant role in drawing the conclusions. However, the results depict that diet labels can improve the taste of less healthy foods which satisfies the hedonic attitude without influencing the utilitarian attitude towards healthy foods. The most essential factors which played versatile role in the entire study were advertising, health labels, satiation, taste etc. Likewise, Hartley et al. (2013) conducted a research with respect to the fruits and vegetables consumption by individual. The factors covered in this study are sensory appeal, familiarity and habit, social interaction, cost availability, time constraints, personal ideology, media, advertising and health. The study reveals that food is not just consume for the nutrient purpose but for excitement and pleasure. According to the research taste, texture, quality, smell and appearance are found to be influential factors. These are the factors which stimulate people to buy fruits and vegetables.

Similarly, Joshi & Rahman (2015) investigated the consumer motives, intentions and believe of consumers regarding organic food. The results reveal that sensory factor is the most important factor while making purchase decision next to price and safety. It also reveals that people who are price conscious are less inclined to buy organic food, contrary people who are willing to experience new things and innovations are considered to be the frequent buyers of organic food and are go with the sensory appeal. Moreover, taste is one of the main factor organic food while making purchase decision because consumer associate the higher price with the quality of food in terms of taste that if its expensive so it must be taste better (Joshi & Rahman, 2015).
H1: Sensory appeal has the significant impact on the buying behavior of consumers of organic food.

Ecological welfare:

Auger et al. (2010) interrogated the factors which motivates a consumer to purchase organic food or not to purchase it. Eight organic items which were mentioned for the research purpose were apple, carrot, chicken, beef, bread, pasta, eggs and yogurt. Primarily, the participants were those who purchase organic foods regularly. Nevertheless, the entire study depicts that the respondents feel the organic foods as the social and individual values among which the most pertinent factor is the major health concerns of the family. Moreover, the animals and the safety of the environment is also given prior importance by the people.

Harper & Makatouni (2002) carried out a study in which they focused upon the buying behavior of consumers in relation to the production of food and its major effects on farm animals. This study highlights that many buyers initially had a misconception between the “organic” and “free-range” food and both of them were considered to be the same due to which there was a vast effect on the buying behavior of the consumers. All in all, the results depicted that the buying behavior of the consumers had a great impact on their perceptions, beliefs and ethical issues towards the organic food. However, the purchasers were majorly concerned about the food produced through animal-friendly methods and this factor was considered to be the main reason behind the purchase of organic food. However, Pomsanam et al. (2014) examined the determinants of regular and occasional consumers while making purchase decisions. The results show that ethical considerations are the most important factor of regular consumers.

H2: ecological welfare has the significant impact on the buying behavior of consumers of organic food.

Price:

Moreover, Aschemann-Witzel & Zielke, (2017) had a research to identify the answers of two main questions that are willingness to pay influence by the same set of factors that affects purchase intention of conventional food and does willingness to pay is vary according to the category of organic food. The questionnaires were comprising of open-ended questionnaires to analyze the real in the food category. They are more willing to pay according to the quality and brand of the product. Moreover, Paul & Rana (2012) invested a consumer’s willingness to pay with respect to the food quality certification. The result depicted that people who are more conscious about quality food and health meanwhile appointed the consultants to get information about nutrition and health getting from the fruits and vegetables. Consumers are ok with the fact of paying more for green and Halal food because they perceive that green food are more expensive as compare to other conventional food (Saleki & Seyedsaleki, 2012).

Similarly, Wee et al. (2014) conducted a research on consumer’s perception, purchase intention and actual purchase behavior of organic foods products. The intention of constructing this research was to determine the interrelation between consumer’s perception, purchase intention and actual purchase behavior in terms of organic foods. The total of 288 questionnaires was filled by the respondents. The data was collected from the supermarket and the nearby district in Johor, Malaysia. The sampling technique used was convenient sampling method which generated 96% response rate. The results have depicted that consumer’s perception has tremendous influence on purchase intention with respect to health, safety, environmental factors and animal welfare of the product. In which, actual buying behavior was more affected than consumer’s perception due to factors of age, gender, income, education, residence was observed. Consequently, the findings helped marketers to develop effective marketing strategies to convince people on switching to the organic foods and to enhance the buying behaviors in Malaysia.

H3: Price has insignificant impact on the buying behavior of consumers of organic food.

Natural content:

Toong et al. (2015) investigated the factors that effect on intention to purchase towards green and Halal foods of the chicken meat industry in Malaysia. The influential factors are natural content, convenience, lack of knowledge of Halal and green foods, familiarity, price consciousness, attitudes towards purchasing and demographics.
profile. The nature of the research was qualitative research. There are 377 respondents and questionnaires made were for interviewing using simple random technique. The statistical approaches used were descriptive analysis, correlation and ANOVA. The benefits of the consumer’s lifestyle with the increasing intention towards the Halal and green foods in terms of opting the chicken meat in consumer market will be observed in this study. Consequently, the study was conducted to get the knowledge of niche market towards the chicken meat in industry in Malaysia.

Bravo et al. (2013) carried out a research on ‘eating green’ motivation behind organic food consumption in Germany. However, lack of consumption of organic foods was observed due to the difference of opinions of professionals. Data was collected from the focus groups which show there was no direct relation between the consumption of organic foods and the environmental health and safety concerns. Moreover, non-rational discourses were encouraged and disseminated through the mass media. These discourses made a prohibition of enough use of organic foods and though consumption became limited. So, many consumers of organic food had stepped back due to these reasons. The research was conducted through interviews but was recorded as quantitative because some of the questions were asked in questionnaires too. Technically, the theme of this research was to highlight the complex and conservative decision about whether to consume organic food or not.

**H4: Natural content has the significant impact on the buying behavior of consumers of organic food**

Conceptual framework is presented below (Figure 1).

![Conceptual framework](image)

**Figure 1. Conceptual framework**

### 3. Methodology

Data were collected using a web-based survey to recruit participants from pools of consumer panels registered with a market research company. The samples for this study were primary grocery shoppers in the household who had ever purchased any food product labeled “organic.” A sample of respondents who meet the specific sample criteria was invited by email to participate in the study.

The data was collected from the university students and other students that come under age bracket of questionnaire. Online questionnaires were created and targets more than 350 respondents online on social networking sites and through emails. Age bracket which was used were in the questionnaire was 18 to 30 young generation. 370 people were targeted to response on the questionnaire and after excluding outliers and missing responses 350 appropriate response were recorded, 350 showed great response to study.
Non random sampling technique is used in the research paper for this study. The findings were that students’ approval and reliability towards the study by using 5-point Likert scale shifting from (1) ‘strongly disagree’, (2) ‘disagree’, (3) ‘neutral’, (4) ‘Agree’, (5) ‘Strongly Agree’. Questionnaire was created on Google docs and was distributed on email and social sites to all the respondents. Only electronic medium is used to collect data, The research instrument which is used in this research is adapted from the previous article It contains 8 components that states the consumer behavior towards organic food and measure variables.

Table 1. Profile of respondents (N=350)

<table>
<thead>
<tr>
<th>Demographic items</th>
<th>Frequency</th>
<th>Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
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<td></td>
</tr>
<tr>
<td>18-25</td>
<td>310</td>
<td>88.3%</td>
</tr>
<tr>
<td>26-30</td>
<td>41</td>
<td>12%</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
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<td></td>
</tr>
<tr>
<td>Male</td>
<td>194</td>
<td>55.3%</td>
</tr>
<tr>
<td>Female</td>
<td>156</td>
<td>44.7%</td>
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<tr>
<td><strong>Qualification</strong></td>
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</tr>
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<td>Matric</td>
<td>8</td>
<td>2.3%</td>
</tr>
<tr>
<td>Intermediate</td>
<td>29</td>
<td>8.3%</td>
</tr>
<tr>
<td>Under Graduate</td>
<td>220</td>
<td>62.7%</td>
</tr>
<tr>
<td>Graduate</td>
<td>93</td>
<td>26.5%</td>
</tr>
</tbody>
</table>

The sample represented the responses of the students and other users of organic food from different areas and in total 350 questionnaires were filled and returned. The details of demographic profiles are presented in table 1. This table is divided in 3 parts Age, Gender and Qualification. As seen from demographic characteristics of age group shows that 88.3% respondents were falling in the age bracket of (18-25) and rest 12% respondent were falling in the age bracket of (26-30) In terms of gender, the 55.3% of respondents were male, while 44.7% were female hence equally distributed. The minority of respondent were from matric which is 2.3% then intermediate respondents were 8.3%. The majority of the respondent were undergraduate 62.7% whereas, 26.5% were graduate.

4. Analysis & Results

To make sense out of this data they have Smart PLS software version 3.1.6 is used and structure modeling equation SEM was used in this software. A sample size of 320 questionnaires was used in this study. However, PLS-SEM is specifically very effective and suitable in analyzing the complexed behavioral and structural models (Hair et al., 2011; Wang & Yang 2018; Takele, 2018; Stark & Yahaya, 2018; Habib & Mucha Sr 2018). Furthermore, table 2 depicts the results of measurement models whereas, table 3 elaborates the summary of statistics. Nevertheless, the model of measurement went through several tests for the proper composition of validity and reliability as mentioned by Hair et al. (2011). Moreover, convergent validity is created for the construct is AVE (average variance extracted) is above the threshold i.e 0.50 (Fornell and Larcker, 1981) all construct passes this test successfully as mentioned in the table 2. Moreover, all of the items of this study have loading more than 0.70 which is relevant and eligible (see table 3) along with their respective variables (see table 4). Nevertheless, scale validity is analyzed with the help of Cronbach’s α and composite reliability which is above 0.70 and indicates that it is reflecting very positive and eligible results. All of the constructs are showing the AVE about 0.5 which is in the acceptable range. Table 2 is demonstrating the variables reliability and compatibility individually as well as collectively and in both cases it indicates the level of acceptance and eligible demonstration. Which interprets that the constructs and variables composed for the study is quite authentic and reliable on which the entire study can be depended.
Table 2. Summary Statistics

<table>
<thead>
<tr>
<th></th>
<th>BI</th>
<th>ECO</th>
<th>HED</th>
<th>NAT</th>
<th>NUT</th>
<th>PR</th>
<th>SEN</th>
<th>UTI</th>
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<tbody>
<tr>
<td>BI</td>
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<td>ECO</td>
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<tr>
<td>HED</td>
<td>0.411</td>
<td>0.317</td>
<td>0.834</td>
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<td></td>
</tr>
<tr>
<td>NAT</td>
<td>0.565</td>
<td>0.566</td>
<td>0.188</td>
<td>0.823</td>
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<td></td>
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<td>NUT</td>
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<td>0.200</td>
<td>0.743</td>
<td>0.915</td>
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</tr>
<tr>
<td>PR</td>
<td>0.221</td>
<td>0.185</td>
<td>0.221</td>
<td>0.214</td>
<td>0.277</td>
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<td>0.377</td>
<td>0.542</td>
<td>0.692</td>
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</tr>
<tr>
<td>UTI</td>
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<td>0.186</td>
<td>0.673</td>
<td>0.755</td>
<td>0.231</td>
<td>0.599</td>
<td>0.899</td>
</tr>
</tbody>
</table>

The bold values show the significance of each constructs which highly indicates that the value is above 0.5. Furthermore, each bold value of the variables highlights that the diagonal elements is the square root of AVE. However, the bold values criteria are that it should be above then the rest of the mentioned values and the highlighted values above is greater than the rest of the values which shows the eligibility of the constructs.

Table 3. Loadings and Cross Loadings

<table>
<thead>
<tr>
<th></th>
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<th>ECO</th>
<th>HED</th>
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<th>NUT</th>
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<th>SEN</th>
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<td>Eco_1</td>
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<td>0.744</td>
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<td>0.471</td>
<td>0.142</td>
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<td>0.437</td>
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<td>0.453</td>
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<td>0.319</td>
</tr>
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<td>0.413</td>
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<td>0.176</td>
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<td>0.223</td>
<td>0.900</td>
<td>0.291</td>
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<td>Sen_1</td>
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<td>0.409</td>
<td>0.171</td>
<td>0.391</td>
<td>0.547</td>
<td>0.226</td>
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<td>0.531</td>
<td>0.279</td>
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<td>0.318</td>
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<td>0.312</td>
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<td>0.522</td>
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<td>0.763</td>
<td>0.179</td>
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<td>0.437</td>
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<td>0.932</td>
<td>0.269</td>
<td>0.642</td>
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<td>0.539</td>
<td>0.179</td>
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<td>0.501</td>
<td>0.166</td>
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<td>0.868</td>
<td>0.190</td>
<td>0.591</td>
<td>0.614</td>
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<tr>
<td>pr_2</td>
<td>0.243</td>
<td>0.165</td>
<td>0.226</td>
<td>0.229</td>
<td>0.283</td>
<td>0.949</td>
<td>0.334</td>
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</tr>
<tr>
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<td>0.485</td>
<td>0.149</td>
<td>0.562</td>
<td>0.666</td>
<td>0.222</td>
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<td>0.524</td>
<td>0.431</td>
<td>0.145</td>
<td>0.628</td>
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<td>uti_4</td>
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<td>0.622</td>
<td>0.691</td>
<td>0.177</td>
<td>0.577</td>
<td>0.912</td>
</tr>
</tbody>
</table>

The loadings of each construct are ought to be very significant. Primarily, as per the recommended threshold point which is 0.55 each and every construct of this study is showing the above level indication which mean that the reliable composition and significance is quite relevant and in the premises of acceptance. However, the
loading of the constructs is done for examining the level of significance of the study variables which will lead the variables to the final conclusion. This test is the most essential one which is examining the threshold points of the variable that either it is going to be effective throughout the study or not.

Table 4. Heterotrait-Monotrait Ratio (HTMT) Results

<table>
<thead>
<tr>
<th>BI</th>
<th>ECO</th>
<th>HED</th>
<th>NAT</th>
<th>NUT</th>
<th>PR</th>
<th>SEN</th>
<th>UTI</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI</td>
<td>0.615</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>ECO</td>
<td></td>
<td>0.588</td>
<td>0.464</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>HED</td>
<td>0.671</td>
<td>0.733</td>
<td>0.289</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>NAT</td>
<td>0.700</td>
<td>0.681</td>
<td>0.258</td>
<td>0.846</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NUT</td>
<td>0.239</td>
<td>0.233</td>
<td>0.287</td>
<td>0.262</td>
<td>0.307</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PR</td>
<td>0.744</td>
<td>0.674</td>
<td>0.482</td>
<td>0.631</td>
<td>0.763</td>
<td>0.392</td>
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</tr>
<tr>
<td>SEN</td>
<td>0.682</td>
<td>0.649</td>
<td>0.243</td>
<td>0.784</td>
<td>0.830</td>
<td>0.264</td>
<td>0.678</td>
</tr>
<tr>
<td>UTI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Heterotrait Monotrait ratio (HTMT) is indicating that none a single value is above 0.83. As the threshold suggested by Hair et al. (2011) is that the assessed variance inflation factors should be below 0.90 and the above mention table 4 elucidates that each if the constructed variable is lying between 0.2 till 0.8. This is indicating the acceptance level of the test. Nutritional Content factor is again dominating with the highest ranked score i.e. 0.84. The test is meant to acquire and analyze the most significant variables and to check its reliability and compatibility.

Table 5.

<table>
<thead>
<tr>
<th>Regression Path</th>
<th>Effect Type</th>
<th>SRW</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECO -&gt; HED</td>
<td>Direct</td>
<td>0.21</td>
<td>Supported</td>
</tr>
<tr>
<td>ECO -&gt; UTI</td>
<td>Direct</td>
<td>0.073</td>
<td>Supported</td>
</tr>
<tr>
<td>HED -&gt; BI</td>
<td>Direct</td>
<td>0.304</td>
<td>Supported</td>
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<td>NAT -&gt; HED</td>
<td>Direct</td>
<td>-0.006</td>
<td>Not Supported</td>
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<tr>
<td>NAT -&gt; UTI</td>
<td>Direct</td>
<td>0.221</td>
<td>Supported</td>
</tr>
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<td>NUT -&gt; HED</td>
<td>Direct</td>
<td>-0.195</td>
<td>Not Supported</td>
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<td>NUT -&gt; UTI</td>
<td>Direct</td>
<td>0.0464</td>
<td>Supported</td>
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<tr>
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<td>Direct</td>
<td>0.117</td>
<td>Supported</td>
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<td>PR -&gt; UTI</td>
<td>Direct</td>
<td>0.001</td>
<td>Supported</td>
</tr>
<tr>
<td>SEN -&gt; HED</td>
<td>Direct</td>
<td>0.36</td>
<td>Supported</td>
</tr>
<tr>
<td>SEN -&gt; UTI</td>
<td>Direct</td>
<td>0.119</td>
<td>Supported</td>
</tr>
<tr>
<td>UTI -&gt; BI</td>
<td>Direct</td>
<td>0.558</td>
<td>Supported</td>
</tr>
</tbody>
</table>

The table 5 exhibits the regression model which is basically developing the hypothesis of each variable and as per the standardized regression weight of each factor the results are mostly favorable and few unfavorable. SRW test is the eligibility criterion test which highlights whether the factor is going to play supportive role in entire study or not. It highly measures the significance of the variable. Hypothesis 1 is showing the relationship between the ecological welfare and the hedonic attitude and the results depicts that both of these variables are having positive relationship among them which means that both of the constructs moves in the same direction and are supportive which means that the expected results of these constructs quite significant which elaborates that when the ecological welfare emphasizes the hedonic attitude of the consumers. It reflects the idea that people re concern with the ethical standards and environmental safety. The two variables shape the hedonic attitude of the consumers. However, the H2 is the relationship between ecological and utilitarian attitude which shows the direct correlation and supportive results. Here it means that the satisfaction level of the consumer is highly associated with the environmental safety products. Nevertheless, H3 is reflecting the relationship between hedonic attitude and behavioral intention which depicts the positive and supportive relationship. It means
that the behavior of consumer is shaped when his or her hedonic attitude is satisfied and then he or she try to consumer organic food. Moreover, H4 is comprised of natural content and hedonic attitude which shows the negative relationship between them and the significance level is so minimal that it is categorized in not supported range. Which conceptually means that the product made up of purely natural and healthy content is unable to satisfy the hedonic attitude which actually means that people are unable to enjoy pleasure in the organic food consumption? H5 is based on natural content and utilitarian attitude whereas, H6 is comprised of nutritional content and hedonic attitude both are showing positive relationship and are having significant impact. This means consumer utilitarian need is satisfied when he enjoys the natural content in organic food and the hedonic need is also satisfied when there is the nutritional content availability in the organic food. H7 depicts that the nutritional content is supported with the utilitarian attitude. Which means both constructs have a significant impact and moves in the same direction. H8 and H9 are comprised of relationships between price and hedonic attitude and price with utilitarian behavior respectively. It interprets that H7 hypothesis is supportive in its nature and has positive impact among each other whereas, H9 depicts the fact that price and utilitarian attitude is having unsupportive impact which shows the level of insignificance. It means that increment in price will show increment in utilitarian attitude with minimal significance i.e. change. Whereas, H10, H11 and H12 shows the supportive relationship with positive correlation bonding. Here it emphasizes that sensory appeal has the significant impact on the hedonic attitude same is the case with sensory appeal and utilitarian behavior. However, utilitarian attitude and behavioral intention also depicts the significant impacts and positive correlation.

5. Conclusion

The primary motive of the study is to identify the consumer buying behavior of organic food with respect to health and safety concern in the framework of Malaysia. The entire study covers the six main variables that is the nutritional content, ecological welfare, natural content, sensory appeals and price which all together influence the hedonic and utilitarian attitude then shape the purchase intension of the consumer. Moreover, the 36 research questions were adopted from the article to collect the data from random population to analyze their purchase intension of organic food. The sample size of the study was 370 from which 350 appropriate responses were collected and the whole data collection process was done through social media by online questionnaires. After the collection of data, the various test has been applied to test the reliability and eligibility of the variables as well as the study. Firstly, the test which has been run is Cronbach’s alpha to analyze the reliability of instruments and collected data which shows the positive result. Secondly, the correlation test has been applied to check the connectivity of each factor to identify the purchase intention of the consumers. Thirdly, loading and cross loading test has been run to identify the significance level of each variable. After that the Haterotrait Monotrait ratio and regression model applied to verify the reliability of most significant variable and the most supportive variable of the entire study. However, from the above analysis the researcher concluded that nutritional content is dominating in each analysis which has an influence on utilitarian attitude that clearly indicates people consume organic food for the sake of satisfaction and good health. Furthermore, price is another factor which has the strong impact on utilitarian attitude. Whereas, the insight of ecological and sensory appeal has the direct impact on the hedonic attitude.

Form the findings, it should be recommended to the grower as well as the provider to keep organic foods free from any sort of pesticides and chemicals which convert natural, hygienic and healthy food into artificial and unhealthy which will never entertain those people whose first priority of food consumption is nutrition, health and fitness. Whereas, the prices of organic food should be kept affordable for the consumers because it is another variable of the study which plays a versatile role in emerging the purchase intension of the people that is why the sellers should compromise on prices for retaining and maintaining the long-term relationships with the customers.
References


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Abstract. The prime objective of the current study is to explore the nexus between job involvement, turnover, and organizational commitment. Meanwhile, the study has examined the mediating role of organizational commitment in the relationship between job involvement and turnover. The study broached an argument that in the era of globalization, it has been regarded to be a key issue to deal with employee turnover for any business organization. To date, agreement on how to practice this concept has not yet been resolved. Employing the survey-based methodology, the SEM-PLS technique is used to test the hypothesized relationships. So, the current study has used SEM-PLS as a statistical tool to answer the research questions raised in this study and research objectives envisaged in the current study. The data is collected from the managers of the manufacturing firms in Indonesia. The findings of the study have provided support to the theoretical foundation and the proposed hypothesis of the current study. The current study will be helpful for policymakers and practitioners in understanding the issues related to job involvement, turnover, and organizational commitment. In author knowledge, this is among very few pioneering studies on this issue.

Keywords: job involvement; turnover; organizational commitment; Indonesia


JEL Classifications: J28, J63

1. Introduction

Organizations have shifted focus from tangible to intangible sources to built and sustain competitive advantage so they can survive in the current era of a competitive market. The intellectual capital of the organization is reflected through competencies, capabilities and knowledge-based resources. These factors are defining the knowledge-based economy on an increasing basis. Thus, the main focus of organizations now a day is building the human capital, information system resources, knowledge management and intellectuals. It is important to realize their main role as the critical force, which makes the organization successful and help in sustaining their competitive advantage (Dahiyat, 2015).

In the current era of globalization, employee turnover is the basic issue of the number of organizations. Researchers reported that employee turnover is a serious issue for firms. Organizations are burdened by providing
good pay along with other benefits, and good working environment, which is important to fulfill the needs of the employee (Yin-Fah, Foon, Chee-Leong, & Osman, 2010; Bernardi, 2019; Lorincová et al., 2019).

It is the desire of every business firm that turnover of an employee is reduced, and its productivity is increased. As a result, profitability is increased as well. Reducing the turnover of the employees is the obligation of the organization. When organization have to hire the new employee, they have to bear the direct cost including recruitment, selection, orientation, workshop and training of the newly hired employee. There are indirect costs associated like the collapse of social capital stress among the workers, reduction in self-confidence of employees and spending on the newly hired employee. Additionally, it becomes very difficult for an organization to achieve its goals in the presence of employee turnover. In fact, employee turnover is the major concern for the organizations, and they are looking to adopt the strategies by which they can retain the employees (Al Mamun & Hasan, 2017).

It is the permanent challenge for the organizations to retain the professionals for a longer period of time. An employee leaves the organization for a number of reasons. Two of the major reasons to leave the organizations are “job involvement” and “organizational commitment” (Alshammari, Qaied, Al-Mawali, & Matalqa, 2016; Bonds, 2017; Wynen, Van Dooren, Mattijs, & Deschamps, 2019; Yücel, 2012). Therefore, in the current study, we are discussing these two factors in order to know that two of these factors might be emphasized. It is critical for organizations and management to understand different strategies required to persuade their employees, so they continue to work for the organization. The main concern of the employers should be to produce committed employees so they can reduce absenteeism and turnover, which in turn will increase the performance and revenue of the firm (Ahmed & Nawaz, 2015).

One of the major factors that helped organizations to improve their productivity in the recent past is the organizational commitment of employees. Every employee is part of the organization working in that organization. The commitment of every employee varies who work in the organization. One of the major factors of employee commitment is the way employee see the organization and the differences among them and other employees that make them separate from others. The committed employee is very important for the organization. The organization use a number of resources to find the correct person for the job. At this stage, it becomes very important for the firm to retain that employee for a longer period of time. In this process, commitment comes into play, which is an emotional response which can be measured by the behavior, attitude and beliefs of the people, which varies from high to low (Anttila, 2015: Mahmood et al., 2016; Hussain, Abidin, Ali, & Kamarudin, 2018).

For this reason, Employers try to develop the workforce which is committed through the adoption of strategies that are best for retention of employees. The positive attitude of the organization is the one example which gives organization ability to create satisfaction and job involvement among the employees. Additionally, when the workforce is committed, involved and motivated in their work, it is called the special asset for the organization and plays a critical role in the success of the firm and reducing the rate of turnover as well (Abdallah, Obeidat, Aqqad, Al Janini, & Dahiyat, 2017; Orji et al, 2018; Perera et al, 2018; Pratama & Meutia, 2018).

Researchers have defined job involvement as the importance of working between the people and values of goodness. Job involvement is the subjective condition which makes employees devoted toward their job. As a result of job involvement and job, commitment, employees spend energy to achieve personal and organizational goal. When there are commitment and involvement of employees towards their job, workers enjoy the work and tasks assigned to them. Job involvement reduces the desire to leave the job and increase the participation, voluntary actions, emotional attachments, organizational citizenship behavior, organizational commitment and job satisfaction among the employees of the organization (Rahati, Sotudeh-Arani, Adib-Hajbaghery, & Rostami, 2015).

Job involvement of employee results in the presence of employee timely at work, employees feeling of triumph, sense of attainment and optimism regarding the organization. On the other hand, organizational and personal goals are aligned. External and internal motivation of employees is enhanced by some job and involvement of employees towards them (Akinbobola, 2011 & Zandi & Haseeb, 2019).
Researchers mentioned that job involvement provides power to individuals to make decisions to strengthen the foundation of the organization. Level of employee’s job involvement, commitment and motivation can be checked by the data of employees’ retention. It is less likely that employees with a high level of job involvement, commitment and motivation will not leave the organization (Blau, 1985; Razzaq, 2014).

In the past, the top management did not give attention to the issues related to the turnover of the employees. Managers did not understand the way the productivity of the organization is impacted by the turnover of the employees. So, it is very significant to conduct research on turnover of employees because it will help in identifying the problems causing employees to switch their job (Al Mamun & Hasan, 2017). The current study adds significant literature to the body of knowledge regarding these important variables of human resource. Study signifies that organizational commitment mediates the relationship between employee turnover and his job involvement.

The main purpose of the study is to look at the different causes creating the turnover among the employees of the organization. This study explores that strategies that enhance job involvement of employees must be implemented by the organizations, hence, to improve the organizational commitment of employees towards the particular organization. Thus, the employees will not voluntarily leave the organization, which will influence the overall organizational productivity.

2. Literature Review

Turnover

Turnover is attributed to outflow and inflow of the employee of an organization. Researchers consider this as one of the most important phenomena because managers are obligated by this to manage, comprehend, and capitalize on the consequences. Researchers defined turnover of employees working in an organization as opposite to retention. It is a relationship between the termination and admission related to the average amount of employees, independent of the reason and in a certain time period that causes flow (Ramalho Luz, Luiz de Paula, & de Oliveira, 2018; Orji et al, 2018; Rahman, 2017; Riaz & Riaz, 2018).

Employee turnover is the situation in which people working in the organization departs from their due to a number of reasons. Therefore, it negatively impacts the organization in terms of abilities and expenditure so that the minimum required services are distributed. When an employee leaves the job, it impacts the workforce and organization both. As the impact of turnover is very depressing, so scholars consider this topic of great importance (Yankeelov, Barbee, Sullivan, & Antle, 2009).

One of the important impacts of turnover is an increment in the cost of training and recruitment of fresh employees. Businesses have to bear the cost to hire and interview the new candidate. Additionally, hiring a new employee who is skilled as well is very time taking and costly process because organizations must spend money to hire new employees, train them and make them productive for the organization. On the other hand, the concentration of experienced employees is diverted because they are responsible for training the new employee. All these activities will negatively impact the productivity, revenue and profitability of the organization. Additionally, the combined impact of all these effects leads to a decrease in the profit of the organization. Any business activity which leads to reduce the productivity or increase the cost impact the profitability of the organization.

The profit margin of business decrease as a result of an increase in turn over, which is evident from the example of Harvard business school. Most of the times, it takes business months to achieve the same amount of profitability. It is because un expected cost is increased for the business as a result of high turnover (Ton & Huckman, 2008).

Therefore, it is critical for the business to develop and maintain a strategic advantage. This business can do be
retaining the skilled, talented and hard-working employees. Therefore, it is important that business understand the importance of employee who is valuable. They must also identify an employee who does not contribute to the growth of the organization. This can be done by the organization by adopting various strategies in which a number of employees are involved in every function of the organization. By this way, commitment and motivation of employees are increased (Mak & Sockel, 2001).

Organizational Commitment

Organizations are very much involved in the concept of organizational commitment since long. But still, it is a very important concept because of the changing dynamics of the industry. The demand for the skilled employee is rising due to the intense competition, so the skilled employee is invited in many organizations to join for the job. Whereas, it is very difficult for an organization to find skilled and qualified employees as the replacement in the organization. Therefore, organizational commitment is considered as one of the most important concepts. A number of different definitions are presented by a number of researchers to explain and define the concepts (Jain, Giga, & Cooper, 2009; Mahmood et al., 2016).

Researchers considered organizational commitment as the psychological commitment or attachment of employee with the organization. Researchers mentioned that it shows the amount of which adopts or internalize the characteristics of an organization. Its also been defined as the force which binds the employee to certain actions required to achieve certain goals and objectives of the organization (Ruokolainen, 2011). Organizational commitment is defined by the scholars as having three characteristics including (1) strong desire in the organizational employee to maintain its membership (2) willingness of employee to put effort for the goals and objectives of organization (Enache, M. Sallán, Simo, & Fernandez, 2013). On the other hand, according to the theory of Allen Meyer (1990), there are three different forms of commitment in the employee namely normative commitment, continuance commitment and affective commitment (García-Cabrera & García-Soto, 2012).

The emotional involvement, identification and attachment of employee with the organization are known as affective commitment. The employees having strong affective commitment wants to stay in the organization because they want to stay (Allen & Meyer, 1990). The commitment based on the amount of cost, which will be bearded by the employee if the employee leaves the organization. So, they want to stay in the organization because they do not have any other choice. In the end, under normative commitment, the employee is obligated to stay in the organization. In other words, the employee ought to stay in the organization, so he/she stay in the organization (Norizan, 2012; Rosli & Siong, 2018; Saad et al, 2018; Myambo & Munyanyi, 2017).

Job involvement

Researchers have defined job involvement as the degree to which an employee wants to be committed or to be identified by the job assigned. The employees who are involved highly with their job wants to perform well and get good results. These people care a lot about their job, and they are also concerned about their tasks (Chughtai, 2008).

Despite that, the construct of organizational commitment and identification are the same, but these constructs differ as well. These constructs look the same because they are related to the identification of employee with the experience of work. Job involvement is basically the involvement of employee with its immediate activity of task. Therefore, there are a number of cases in which the employee is not committed to the organization but involved in the job (Singh & Gupta, 2015).

Personal characteristics are involved in job involvement, including values, level of control, need strength, tenure, sex, education and age. Job characteristics are also involved like supervisory behavior, feedback, skill variety, task identity, task significance, and task autonomy. Researchers reported that personal and situational factors predict job involvement (Carmeli, 2005).
Most of the researchers agree that employees who are involved in their job highly placed their job in the center of their all interests. On the other hand, the concentration of low level of involved employees is on the other things than their jobs. The employees who have a high level of job involvement are more self-confident and independent. Moreover, they perform their work according to the need of the organization (Chen & Chiu, 2009).

Job involvement of employees is also highly affected by the work environment in which job is being performed. Its is because employee perceives ones work to be meaningful, can give feedback, maintain a clear set of norms, can control how to complete the task, can provide supportive relation to coworker and supervisor (Brown & Leigh, 1996).

Organizational Commitment and turnover

An employee who is committed is motivated truly so it can meaningfully contribute to the success of the organization. Commitment is positively related to performance and work effort. Whereas, it is negatively related to turnover, workplace stress, intention to leave and absenteeism (Alexandrov, Babakus, & Yavas, 2007; Nasr, 2012; Paré & Tremblay, 2007; Ugboro, 2006; Vandenberghe, Bentein, & Stigglishamber, 2004). Past studies upon the development and learning of organization found the link of organizational commitment with turnover as well. Its been reported that there exists a significant negative relationship between turnover and organizational commitment of employee (Joo & Park, 2010).

Job involvement and Organizational Commitment

There exists a significant impact of job involvement on a number of organizational outcomes. It’s been reported by a number of researchers that there exists positive significant impact of job involvement of professional and organizational commitment. As a result, the turnover, productivity sales, profit, stress, turnover intention and satisfaction are also impacted as well. (Kappagoda, 2013; Singh & Gupta, 2015; Uygur, 2009).

It is because past studies have conceptualized job involvement as the active participation of one employee in his/ her job. It is also conceptualized as a degree of involvement of employee in its job, so that the intrinsic needs can be fulfilled. As these needs are fulfilled, satisfaction is achieved by the employee, as the result of the job, involvement employee can make a decision regarding his. Her job, which also strengthens job involvement (Zopiatis, Constanti, & Theocharous, 2014). As a result, high job involvement brings a commitment to the employee towards its organization. So, the employee put a lot of effort to achieve organizational goals and objectives (Rotenberry & Moberg, 2007).

Researchers pointed out that there exists a strong relationship between normative commitment and effective commitment and job involvement with lead to the continuance commitment (Kuruüzüm, Ipekçi Çetin, & İrmak, 2009). According to scholars, normative and affective commitment has a strong relationship with the involvement of the job of the employee (Ketchand & Strawser, 2001; Tayyeb & Riaz, 2004).

Job involvement and Turnover

It’s been observed by a number of researchers that attitudinal variables like job satisfaction, job involvement and organizational outcomes are the outcomes of HR practices of the HR department of the organization. The HR practices of the organization decide that an individual will stay or leave the organization, causing the turnover (Biswas, 2008).

Researchers have found that all three approaches of organizational commitment, namely institutional, normative and affective have a negative impact on the turnover of the employee. It is because the possibility of turnover is decreased due to commitment. The main reason is that such an employee is motivated and committed to working for the organization (Ramalho Luz et al., 2018).
Studies find that job involvement had a negative and significant effect on employee’s outgoing intent and job involvement is able to fabricate good teamwork among employees. The preceding statement is in line with other studies, which finds that high employee involvement proved effective to increase job satisfaction and able to discourage employee turnover intention (Alshammari et al., 2016). Job involvement in practice relates to absenteeism, the degree of application to stop working and wishes to participate in a team or working group. Moreover, unnoticed job involvement level would result in employees’ absence and high turnover intention (Hairiah & Faslah, 2017).

Research Framework is presented below (Figure 1).

![Research framework](image)

The preceding framework has led to hypothesize the following research hypotheses:

H1: the job involvement is in a significant relationship with the turnover.
H2: The job involvement is in a significant relationship with organizational commitment.
H3: The organizational commitment is in a significant relationship with the turnover.
H4: Organizational commitment mediates the relationship between job involvement and turnover.

3. Research Methodology

The original questionnaire was worded in English, but since the targeted study respondents ‘mother tongue, it was translated into language following the recommendations by (Brislin, 1970). The translation was carried out through back translation procedure, where the questionnaire was translated into English in order to confirm both validity and reliability of the wording. The two English versions of the questionnaire were then compared after which minor changes were made accordingly. Back translation guarantees the near equivalence of the two English versions of the questionnaire. Data analysis in this study was conducted with the help of the software package, Smart PLS, Version 2.0 M3, as suggested by (Ringle, Wende, & Will, 2005). Smart PLS is extensively utilized in the field of marketing and management science (Reinartz, Haenlein, & Henseler, 2009).

According to researchers, a PLS model is generally analyzed and interpreted in two phases; first measuring the outer model for validity and reliability and second, analyzing the structure model by R square, effect size, predictive model relevance, and goodness of fit (GOF) (Hair, Ringle, & Sarstedt, 2011). In the first phase, properties of multi-item constructs are measured with the inclusion of convergent validity and discriminant validity. Following the second phase, the study hypotheses testing is conducted through the bootstrapping method. The initial study model comprised reflective measurement items that are manifest variables or indicators, four latent variables including two independent, one dependent variable and one mediating variable constituting 16 relationships between them on the basis of the proposed study.

4. Results

Many contemporary studies have viewed SEM not only as a statistical procedure but also as a process which involves few stages: (1) conceptualizing the model (2) parameter identification (3) model specification (4) estimation of model (5) modification of model and (6) evaluation of parameters (Hameed, Basheer, Iqbal, Anwar, & Ahmad, 2018; Hancock & Mueller, 2007). These steps are necessary when carrying out SEM analysis (Hameed et al., 2018). They are hereby explained in succession. The first stage of any SEM analysis should be for the researcher to conceptualize the model, this entails pointing out which relationships are hypothesized to exist among observed and latent variables (Figure 2).
The theoretical model is based on the underlying theory that gave rise to the variables being investigated and should be focused on literature and knowledge on the subject matter. Ideally, in SEM applications, the operationalized theories assume the form of the measured variable path analysis model, that is hypothesized structural or causal relationships among variables that are directly measured (Hancock & Mueller, 2004). Before testing of hypotheses, the partial Least Square-Structural Equation Modeling is employed to analyze the outer model (Table 1). A method was followed to assess the model as by (Basheer, Siam, Awn, & Hassan, 2019).

Table 1. Outer Loading

<table>
<thead>
<tr>
<th></th>
<th>JI</th>
<th>OC</th>
<th>TO</th>
</tr>
</thead>
<tbody>
<tr>
<td>JI1</td>
<td>0.887</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JI2</td>
<td>0.889</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JI3</td>
<td>0.892</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JI4</td>
<td>0.878</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JI5</td>
<td>0.916</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JI6</td>
<td>0.877</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JI7</td>
<td>0.879</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OC1</td>
<td>0.868</td>
<td>0.879</td>
<td></td>
</tr>
<tr>
<td>OC10</td>
<td>0.863</td>
<td>0.837</td>
<td></td>
</tr>
<tr>
<td>OC11</td>
<td>0.837</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OC2</td>
<td>0.811</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OC3</td>
<td>0.861</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OC4</td>
<td>0.837</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OC6</td>
<td>0.913</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OC7</td>
<td>0.902</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OC8</td>
<td>0.922</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TO1</td>
<td>0.809</td>
<td>0.886</td>
<td></td>
</tr>
<tr>
<td>TO2</td>
<td>0.886</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
According to Hair et al. (2010), convergent validity is the extent to which a set of variables intersect to estimate a particular concept. Analyzing the convergent validity requires the simultaneous testing of three criteria, i.e. composite reliability, factor loading, and the average variance extracted. Firstly, the assessment of loadings for all items indicated that all factor loadings are above 0.5, with a significance level of 0.01 percent, showing an acceptable level according to the literature. Secondly, the composite reliability is tested, which refers to the extent to which a group of items invariably explains the latent variables. The table 2 contains the values for composite reliability and Cronbach Alpha. The range of Cronbach alpha came out to be 0.890-0.964, and range of composite reliability was 0.759-0.971, which was higher than the recommended range (Fornell & Larcker, 1981), i.e. 0.7. The results proclaimed and confirmed the convergent validity. Furthermore, the A VE is also obtained for the outer model in order to assess the convergent validity. It explains the average variance extracted for a set of items in comparison with the shared variance, involving measurement errors. In addition, it determines the variance that the indicators cover in comparison with the variance which is assigned with the measurement errors. Thus, according to several studies if the value of the average value extracted reaches the level of 0.5, then it indicates the adequate convergence of this group of items to determine the required construct. The range of AVE for the present study came out as 0.510-0.919, exhibiting a good validity of the measures.

| TO3 | 0.852 |
| TO4 | 0.876 |
| TO5 | 0.837 |
| TO7 | 0.782 |
| TO8 | 0.790 |
| TO9 | 0.776 |

Developing a discriminant validity is essential to declare the construct validity for the outer model. Therefore, testing of discriminant validity is crucial before the hypotheses testing. A discriminant validity measures the level to which the items of the model differentiate from their constructs. Similarly, the discriminant validity indicated that a number of items had employed different constructs that exhibited no overlapping. Moreover, according to the research, the shared variance of the measures that exist among each construct must be higher than the shared variance between the different constructs (Compeau, Higgins, & Huff, 1999). The square root of the average variance extracted was then replaced for all the constructs with diagonal elements of the correlation matrix, as mentioned in the table. The diagonal elements of the matrix turned out to be greater than the elements of rows and columns, thus, verifying the discriminant validity (Table 3).

<table>
<thead>
<tr>
<th>Table 2. Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>IAS</td>
</tr>
<tr>
<td>PI</td>
</tr>
<tr>
<td>SA</td>
</tr>
</tbody>
</table>

In light of the measurement of construct validity for the outer model, therefore it is assumed that the results of hypotheses testing must be valid and highly reliable. After the goodness of fit test for the outer model, the hypotheses were tested to assess the nature of the association between the variables. The hypotheses testing for the present study is made through PLS Algorithm, employing smart PLS technique (Table 4).

<table>
<thead>
<tr>
<th>Table 3. Discriminant Validity</th>
</tr>
</thead>
<tbody>
<tr>
<td>JO</td>
</tr>
<tr>
<td>JI</td>
</tr>
<tr>
<td>OC</td>
</tr>
<tr>
<td>TO</td>
</tr>
</tbody>
</table>
Table 4. Direct relations

|                  | Original Sample (O) | Sample Mean (M) | Standard Deviation (STDEV) | T Statistics (|O/STDEV|) | P Values |
|------------------|---------------------|-----------------|---------------------------|------------------------|----------|
| JI -> TO         | 0.038               | 0.028           | 0.017                     | 3.918                  | 0.000    |
| JI -> OC         | 0.032               | 0.032           | 0.026                     | 4.527                  | 0.000    |
| OC -> TO         | 0.045               | 0.045           | 0.010                     | 4.294                  | 0.000    |

The mediation effect is shown in table 5.

Table 5. Indirect results

|                  | Original Sample (O) | Sample Mean (M) | Standard Deviation (STDEV) | T Statistics (|O/STDEV|) | P Values |
|------------------|---------------------|-----------------|---------------------------|------------------------|----------|
| JI -> OC -> TO   | 0.028               | 0.028           | 0.007                     | 3.918                  | 0.000    |

Under multivariate analysis, the coefficient of determination shows that the predictor variables explain the endogenous variable. Thus, the magnitude of R² explains the predictive power of explaining the endogenous variable in the model.

Table 6. R-Square

<table>
<thead>
<tr>
<th></th>
<th>R Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>OC</td>
<td>0.501</td>
</tr>
<tr>
<td>TO</td>
<td>0.918</td>
</tr>
</tbody>
</table>

Furthermore, following (Geisser, 1975), the sample was reapplied in order to declare the models’ predictive validity. Partial Least Square technique is used as it is an appropriate and very well software for reusing the sampling technique (Table 6).

5. Conclusion

Meanwhile, the study has examined the mediating role of organizational commitment in the relationship between job involvement and turnover. The study broached an argument that in the era of globalization, it has been regarded to be a key issue to deal with employee turnover for any business organization. To date, agreement on how to practice this concept has not yet been resolved. Employing the survey-based methodology, the SEM-PLS technique is used to test the hypothesized relationships. So, the current study has used SEM-PLS as a statistical tool to answer the research questions raised in this study and research objectives envisaged in the current study. The data is collected from the managers of the manufacturing firms in Indonesia. The findings of the study have provided support to the theoretical foundation and the proposed hypothesis of the current study. The current study will be helpful for policymakers and practitioners in understanding the issues related to job involvement, turnover, and organizational commitment. In author knowledge, this is among very few pioneering studies on this issue. The combined effect of the negatives can result from high turnover, leading a firm to generate less profit. Anything that leads to increase costs or reduce productivity, income will tend to reduce profit. Studies find that job involvement had a negative and significant effect on employee’s outgoing intent and job involvement is able to fabricate good teamwork among employees. The findings are in line with (Alshammari et al., 2016), who finds that high employee involvement proved effective to increase job satisfaction and able to discourage employee turnover intention. Job involvement in practice relates to absenteeism, the degree of application to stop working and wishes to participate in a team or working group. Moreover, unnoticed job involvement level would result in employees’ absence and high turnover intention. Evidence for this is provided by the Harvard Business School; when businesses experience higher turnover, they will get lower profit margins. It often takes months or years for a new business to achieve profitability due to the increase of unexpected costs as high turnover and needs to start a new venture to make a profit.
References


Fornell, C., & Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement error: Algebra and statistics. SAGE Publications Sage CA: Los Angeles, CA.


Yücel, İ. (2012). Examining the relationships among job satisfaction, organizational commitment, and turnover intention: An empirical study. *International journal of business and management, 7*(20), 44. Available at: https://doi.org/10.5539/ijbm.v7n20p44


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SYSTEMATIC RISK AND DETERMINANTS OF COST OF CAPITAL:
AN EMPIRICAL ANALYSIS OF SELECTED CASE STUDIES

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Abstract. The objective of this study is to examine the effect of business size, market value of equity, required rate of return, systematic risk, debt ratio and total debt along with inflation on cost of capital for selected firms in five states of ASEAN region. Secondary data is collected during the time of 2000-2017 for ten firms in each country. Findings through regression analysis indicates the fact that significant determinant for fixed payment ratio is required rate of return, size, market to book ratio, systematic risk, and inflation are significant determinant. For interest covered ratio, key determinants are required return, total debt, and market to book ratio, size, and inflation. For dividend payment, size, debt ratio, inflation, and market value of equity. For interest payment, systematic risk, inflation, log market value of equity, size and market to book ratio are found to be significant determinant. These findings are providing a new insight in the literature of finance and financial management. Both theoretical and practical significance of the study can be viewed through provision of literature discussion and empirical findings. Policy makers, financial analysts, and other industry experts can utilize these findings as a meaningful source for strategic decision. However, future studies can be reconsidered remaining countries in ASEAN region and better sample size of the firms.

Keywords: cost of capital; required rate of return; inflation; market value of equity; ASEAN


JEL Classifications: F21, E31, G1

1. Introduction and Background

From the perspective of corporate finance, concept of risk for the payment of fixed cost like interest and dividend are under significant attention by the reserachers. Growing body of literature is presented, covering the title of risk in the form of fixed payment obligations and overall business growth is provided in both developed and emerging economies. Meanwhile business performance is highly associated to its cost of capital like interest payment and dividend payments. Both performance and cost of debt and cost of equity indicates the fact that firms can get strategic benefits while creating reasonable tradeoff between the both (Botosan, 1997; Gitman, Juchau, & Flanagan, 2015; Khan & Jain, 1992; Linsley, Shrives, & Crumpton, 2006; Artha & Mulyana, 2018; Schwarz, 2018; Mokhova et al., 2018).

For deciding an appropriate financial structure, cost of capital is assumed to be a critical factor as described by earlier reserachers (Bontis, 2001; De Jong, Kabir, & Nguyen, 2008; Gertler, 1988; Rajan & Zingales, 1995; Arregbeyen & Fasanyan, 2017, Masood et al., 2019). Meanwhile, lot of studies have explained the factors asso-
ciated to the capital structure of the business. Among several debt ratio is found to be most important, reflected through total debt over total assets (Bevan & Danbolt, 2002; Van der Wijst & Thurik, 1993; Ali & Harvie, 2015). To summarize overall cost of capital, the idea of weighted average cost of capital covers the interest bearing and liabilities being captured by the business (Arditti & Levy, 1977; Baciodore, Boquist, Milbourn, & Thakor, 1997; Baker & Wurgler, 2015; Miles & Ezzell, 1980; Abdulrasheed, 2017). Investors from the market place provides the portion of equity capital to finance the capital investment of the business. Such financing is in the form of common stock and preferred stock. However, preferred stock is found to has lower portion in the balance sheet, comparatively to common stock equity (Flannery, 2016; Akhir et al. 2018; Hussain, Grabara, Razimi, & Sharif, 2019). The cost of equity portion is reflected in the form of dividend payment to the shareholders over regular intervals.

In addition, for debt portion in the balance, fixed cost is observed in the form of interest payments through operating profit (Foster & Kalev, 2016; Gitman et al., 2015; Aldulaimi & Abdeldayem, 2018). The purpose of this study is to examine the effect size, debt ratio, inflation, size, and systematic risk, required rate of return and market value of equity on various factors considered as capital cost in ASEAN region. The rest of the study is as follows. Section two shows literature review. Section three defines variables. Section four and five indicates the samples, methods and findings of the study. Last section covers conclusion of the study.

2. Literature Review

Various studies have explored the key factors affecting the capital cost in different regions. For instance, (Herianingrum et al., 2019, Boutayeba, 2017) have examined the various determinants of cost of capital for emerging industries of Egypt and middle east region. An empirical analysis have been performed based on the sample firms of 119 companies. Both book and market-based measures to equity and overall cost of capital is calculated. It is found that overall cost of capital is 12 percent while cost of equity is 12.5 percent. To get significant findings, stepwise multiple regression technique is applied. The factors like growth and size are found to be significant indicator of cost of capital. Meanwhile for trading companies, financial and business risk factors are key determinants of cost of capital. In real estate, cost of capital is higher. Meanwhile, the factor of liquidity can not be ignored to analyze its effect of cost of capital (Haseeb et al, 2019; Mira et al., 2019).

Rand, 2007; Brown & Ibeke, 2018 examines the cost of capital and credit constraints and key factors which restrict the manufacturing firms for getting loan facilities from financial market of Vietnam. While using the information through enterprise survey, his study indicates the fact that debt holing of the business can increase between 40 to 115 percent if various constraints for the burrowing the loan. Meanwhile, it is found that business enterprise have not enough time to get rid from administrative difficulties. Besides, larger interest rates are linked to those loans which are under the title of collateral and securities. Liu and Wysocki (2017) focus on the cross-sectional determinants of cost of capital measures. For this purpose, they have examined the empirical association between accrual quality and cost of capital. At first, they have found that accrual quality and operating variation of the business are key determinants. Their findings are found to be empirical addition in the literature work, involving the factors like accrual quality, operating variation of the business and cost of capital.

Drobetz, El Ghoul, Guedhami, and Janzen (2018) examine the factor of investment, policy uncertainty and cost of capital. For this purpose, economic policy is observed as key indicator between investment and cost of capital. They have found that negative relationship exists between cost of capital and investment. However, it is observed that increasing the uncertainty in economic policy lowers the investment sensitivity for those firms which are working as government subsidizes. It is concluded that economic policy and uncertainty can significantly disturb the relationship between cost of capital and investment.

Belkhir, Saad, and Samet (2018) examine the extreme liquidity of the stock and cost of capital. For this purpose, a sample of 45 countries is examined through robust analysis. It is observed that those business firms having extreme value of liquidity are facing higher cost of capital. Meanwhile, it is observed that one standard
deviation increases in the value of liquidity causing a shift of 30 basis points in the value of cost of capital. Meanwhile, this association between high liquidity and cost of capital is observed higher at the time when there is downturn in the market and presence of more volatility. Some other studies have also explored the factor of cost of capital through various determinants. For example, (Huizinga, Voget, & Wagner, 2012; Abosedra & Sita, 2018) explores the capital gains, taxation and cost of capital, (Kwabi, Boateng, & Adegbite, 2018) for trading laws & cost of capital, (Gupta, Krishnamurti, & Tourani-Rad, 2018) for corporate governance, financial development and cost of capital. In addition, (Boubakri, Guedhami, Mishra, & Saffar, 2012; Adegbite, 2017) indicates the relationship between political connection for the cost of capital in the form of equity. Some other empirical work is not neglectable to explore the idea of cost of capital Notables are (Anderson, Mansi, & Reeb, 2003, 2004; Sengupta, 1998) for the cost of debt capital, (Antoniou, Doukas, & Subrahmanyan, 2015; Berger, Chen, & Li, 2018; Botosan, 1997; Botosan & Plumlee, 2002; Cao, Myers, Tsang, & Yang, 2017; Dhaliwal, Judd, Serfling, & Shaikh, 2016; Dhaliwal, Li, Tsang, & Yang, 2011; Hail & Leuz, 2006; Mazzi, André, Di- nysiou, & Tsalavoutas, 2017; Miller & Modigliani, 1958; Richardson & Welker, 2001). To the best of author’s findings this study is a very first contribution, examining the effect of size, systematic risk, inflation, debt portion, market value of equity for the various firms in ASEAN region. Earlier studies have ignored the ASEAN region for the cost of capital and its key determinants through empirical analysis.

3. Measurement of Variables

Definition and measurement of variables are presented in Table 1.

<table>
<thead>
<tr>
<th>Name of Variable</th>
<th>Abbreviations</th>
<th>Definition</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Payment Covered Ratio</td>
<td>FPCR</td>
<td>Indicates the firm’s ability to pay both type of fixed payments eight debt or equity through its operating profit</td>
<td>EBIT/interest expense +preferred stock dividend</td>
</tr>
<tr>
<td>Interest Covered Ratio</td>
<td>ICR</td>
<td>Indicate the firm’s ability to pay its interest payment through operating profit</td>
<td>EBIT/ interest payment</td>
</tr>
<tr>
<td>Dividend Payout Ratio</td>
<td>DIVIDENDPR</td>
<td>It indicates the dividend payment capacity through net income of the business</td>
<td>Dividend paid/net income</td>
</tr>
<tr>
<td>Interest payment</td>
<td>INTERESTP</td>
<td>Reflects overall interest payment by the business in a year</td>
<td>Annual interest payment</td>
</tr>
<tr>
<td>Size</td>
<td>SIZE</td>
<td>Shows the growth of the business through its assets</td>
<td>Total assets of the business</td>
</tr>
<tr>
<td>Market to Book Ratio</td>
<td>M2BRATIO</td>
<td>Measures the risk and return of the business through comparing market value of share to its book value</td>
<td>Market value per share/book value per share</td>
</tr>
<tr>
<td>Required Rate of Return</td>
<td>RROR</td>
<td>Indicates the overall return required by the investor</td>
<td>Measure through risk free return + market risk premium</td>
</tr>
<tr>
<td>Beta</td>
<td>BETA</td>
<td>Measures the systematic risk in the investment</td>
<td>Change in asset return/change in market return</td>
</tr>
<tr>
<td>Inflation</td>
<td>INF</td>
<td>Gradual increase in the prices of goods and services</td>
<td>Annual consumer price index</td>
</tr>
<tr>
<td>Debt Ratio</td>
<td>DEBTRATIO</td>
<td>Measures the portion of debt in total assets</td>
<td>Total Debt/Total assets</td>
</tr>
<tr>
<td>Total Debt</td>
<td>TDEBT</td>
<td>Overall debt portion in the balance sheet</td>
<td>Annual Total debt in balance sheet</td>
</tr>
<tr>
<td>Total Equity</td>
<td>LOGMV ALUEO~Y</td>
<td>Reflects the equity portion for the business</td>
<td>Log value of market value of equity</td>
</tr>
</tbody>
</table>

4. Sample and Methods

This study has considered secondary data technique during the time of 2010 to 2017. Five states from ASEAN region including Brunei, Malaysia, Indonesia, Thailand and Singapore are selected. 10 business firms from each region is selected under sample period of interest, while data is collected through web sources of the company, data stream and annual reports. After the data collection, both descriptive and separate regression analysis have been conducted for each region, which provides better understanding of data trends and causal association between the variables.
5. Results and Discussion

Descriptive findings for the business firms working in the region of Brunei are presented under Table 2. Mean score for fixed payment covered ratio as first dimension of cost of both capital; debt and equity is 1.208. Minimum ratio for FPC is .326 and maximum is 6.71. For interest covered ratio as 2nd dimension of cost of capital is 6.002 with the deviation of .477 for dividend payout ratio as cost of equity capital is 1.86 for overall interest payment, an average amount for the firm’s working in Brunei is 3590 BND. As per the size of the firm, average amount of 10600 in BND is observed. For market to book ratio an average score is 7.20 with the deviation from the mean is 1.05 for required rate of return mean score is 4.428 with the deviation of 1.22. As per the findings for systematic risk (Beta), overall trend for selected firms in Brunei is .646. For inflation an average trend of .389 is observed. While debt ratio has a deviation from the mean is .901. In addition, log of market value of equity is 4.32. For total debt it is 8.97 percent as per natural log.

Table 2. Descriptive Statistics Manufacturing Firms in Brunei

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs</th>
<th>Mean</th>
<th>Std.Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>FPCR</td>
<td>67</td>
<td>1.675</td>
<td>1.208</td>
<td>.326</td>
<td>6.711</td>
</tr>
<tr>
<td>ICR</td>
<td>67</td>
<td>6.002</td>
<td>.477</td>
<td>5.445</td>
<td>7.048</td>
</tr>
<tr>
<td>DIVIDENDPDR</td>
<td>60</td>
<td>1.865</td>
<td>.868</td>
<td>.5</td>
<td>4</td>
</tr>
<tr>
<td>INTERESTP</td>
<td>68</td>
<td>3590</td>
<td>4.41</td>
<td>1621</td>
<td>16668</td>
</tr>
<tr>
<td>SIZE</td>
<td>68</td>
<td>10600</td>
<td>15.20</td>
<td>7230</td>
<td>13170</td>
</tr>
<tr>
<td>M2BRATIO</td>
<td>68</td>
<td>7.20</td>
<td>1.05</td>
<td>2.187</td>
<td>9.652</td>
</tr>
<tr>
<td>RORR</td>
<td>68</td>
<td>4.428</td>
<td>1.229</td>
<td>2.05</td>
<td>12.34</td>
</tr>
<tr>
<td>BETA</td>
<td>67</td>
<td>.646</td>
<td>.796</td>
<td>-.48</td>
<td>.74</td>
</tr>
<tr>
<td>INF</td>
<td>65</td>
<td>.52</td>
<td>.901</td>
<td>-.74</td>
<td>.58</td>
</tr>
<tr>
<td>DEBTRATIO</td>
<td>62</td>
<td>4.32</td>
<td>1.253</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>LOGMV ALUEO-Y</td>
<td>63</td>
<td>8.97</td>
<td>1.50</td>
<td>1.202</td>
<td>5.85</td>
</tr>
</tbody>
</table>

Table 3 reflects the findings for first four regression models for the factor like fixed payment covered ratio, interest covered ratio, dividend payout ratio, and finally overall interest payment. It is observed that required rate of return for the firms in Brunei is significantly and negatively affecting the interest covered ratio, and dividend payout ratio with the coefficient of -.008 and -.003 at 5 percent and 1 percent respectively. Meanwhile, through higher debt ratio, significant and positive influence on dividend payout ratio is observed with the coefficient of .252 and standard error of .0169. Market value of equity through its log conversion indicates a significant but negative influence on DPR. For total debt, effect on interest covered ratio or ICR is 1.27, significant at 1 percent. For model three of DPR, highest explanatory variation is observed; 94.5. This value implies that overall high robust variation in DPR is explained by all the regressors of the model.

Table 3. Regression Findings for Manufacturing Firms In Brunei

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIZE</td>
<td>-6.11e-08</td>
<td>-1.95e-08</td>
<td>2.40e-08</td>
<td>-0.0188</td>
</tr>
<tr>
<td></td>
<td>(1.24e-07)</td>
<td>(2.97e-08)</td>
<td>(3.12e-08)</td>
<td>(0.0354)</td>
</tr>
<tr>
<td>M2BRATIO</td>
<td>-2.85e-08</td>
<td>-1.31e-09</td>
<td>-1.13e-08</td>
<td>0.00409</td>
</tr>
<tr>
<td></td>
<td>(7.16e-08)</td>
<td>(1.12e-08)</td>
<td>(9.67e-09)</td>
<td>(0.0331)</td>
</tr>
<tr>
<td>RROR</td>
<td>-0.0118*</td>
<td>-0.00884**</td>
<td>-0.00300***</td>
<td>-247.5</td>
</tr>
<tr>
<td></td>
<td>(0.00603)</td>
<td>(0.00392)</td>
<td>(0.00109)</td>
<td>(700.0)</td>
</tr>
<tr>
<td>BETA</td>
<td>4.312</td>
<td>-1.495</td>
<td>1.520</td>
<td>56,061</td>
</tr>
<tr>
<td></td>
<td>(9.483)</td>
<td>(5.028)</td>
<td>(1.895)</td>
<td>(1.937e+06)</td>
</tr>
</tbody>
</table>
Table 4 presents the descriptive findings for Indonesian firms under sample period of interest. For FPCR mean score is 1.48 with the deviation of 1.19 for ICR, average value is 6.187 and for dividend payout ratio is 1.789. For the payment of overall interest as cost of debt capital, average amount is 2256 INDR. For the size of firms, overall value is 46800 INDR.

Table 4. Descriptive Statistics For Indonesian Firms

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs</th>
<th>Mean</th>
<th>Std.Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>FPCR</td>
<td>70</td>
<td>1.498</td>
<td>1.199</td>
<td>.089</td>
<td>4.892</td>
</tr>
<tr>
<td>ICR</td>
<td>69</td>
<td>6.187</td>
<td>.652</td>
<td>5.066</td>
<td>7.646</td>
</tr>
<tr>
<td>DIVIDENDPR</td>
<td>69</td>
<td>1.786</td>
<td>.795</td>
<td>.635</td>
<td>4.36</td>
</tr>
<tr>
<td>INTEREST</td>
<td>70</td>
<td>2256</td>
<td>5.01</td>
<td>3366</td>
<td>1.07e+07</td>
</tr>
<tr>
<td>SIZE</td>
<td>63</td>
<td>46800</td>
<td>1.03</td>
<td>10728</td>
<td>59720</td>
</tr>
<tr>
<td>M2BRATIO</td>
<td>65</td>
<td>2.85</td>
<td>5.62</td>
<td>1.9857</td>
<td>1.880</td>
</tr>
<tr>
<td>RROR</td>
<td>68</td>
<td>8.57</td>
<td>4.648</td>
<td>1.05</td>
<td>11.66</td>
</tr>
<tr>
<td>BETA</td>
<td>68</td>
<td>.619</td>
<td>.179</td>
<td>.36</td>
<td>.98</td>
</tr>
<tr>
<td>INF</td>
<td>69</td>
<td>6.784</td>
<td>.891</td>
<td>5.44</td>
<td>8.32</td>
</tr>
<tr>
<td>DEBTRATIO</td>
<td>70</td>
<td>7.06</td>
<td>2.773</td>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td>LOGMVALUEO~Y</td>
<td>68</td>
<td>4.16</td>
<td>1.017</td>
<td>3</td>
<td>6</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

For the business firms working in the region of Indonesia, regression findings are presented under Table 5. It is found that size has its significant and positive impact on the value of fixed payment covered ratio. While market to book ratio indicates a significantly positive influence on both FPCR and interest covered ratio. It is implied that more fixed and interest covered ratio for both sources of capital is observed through market to book ratio of ordinary shares. For systematic risk in terms of beta, significant and negative influence of 1.740 is observed. Meanwhile level of inflation is also causing a significant and increasing impact on value of interest payment. It means higher the inflation in the economy of Indonesia, more payment of interest over debt. Through market value of equity, significant and positive influence is observed over interest payment. While explanatory power under model 3 for Indonesia business firm is 96.3 and for model 4 it is 98.2 reflecting higher change in dividend payout ratio and interest payment (Table 5).
### Table 5. Regression findings for Indonesian Firms

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FPCR:INDONESIA</td>
<td>ICR:INDONESIA</td>
<td>DPR:INDONESIA</td>
<td>INTP:INDONESIA</td>
</tr>
<tr>
<td>SIZE</td>
<td>4.92e-08*</td>
<td>1.48e-08</td>
<td>4.85e-09</td>
<td>0.0460</td>
</tr>
<tr>
<td></td>
<td>(2.76e-08)</td>
<td>(1.09e-08)</td>
<td>(9.03e-09)</td>
<td>(0.0323)</td>
</tr>
<tr>
<td>M2BRATIO</td>
<td>1.59e-07***</td>
<td>8.30e-08***</td>
<td>1.07e-08</td>
<td>0.0679</td>
</tr>
<tr>
<td></td>
<td>(5.77e-08)</td>
<td>(2.58e-08)</td>
<td>(1.03e-08)</td>
<td>(0.0432)</td>
</tr>
<tr>
<td>RROR</td>
<td>0.00154</td>
<td>0.000428</td>
<td>-0.00206</td>
<td>-777.3</td>
</tr>
<tr>
<td></td>
<td>(0.00113)</td>
<td>(0.000475)</td>
<td>(0.000265)</td>
<td>(972.0)</td>
</tr>
<tr>
<td>BETA</td>
<td>-7.835</td>
<td>-0.585</td>
<td>1.335</td>
<td>-1.740e+07***</td>
</tr>
<tr>
<td></td>
<td>(9.477)</td>
<td>(3.827)</td>
<td>(2.637)</td>
<td>(5.452e+06)</td>
</tr>
<tr>
<td>INF</td>
<td>0.624</td>
<td>0.510</td>
<td>0.226</td>
<td>1.919**</td>
</tr>
<tr>
<td></td>
<td>(1.160)</td>
<td>(0.477)</td>
<td>(0.306)</td>
<td>(0.092)</td>
</tr>
<tr>
<td>DEBTRATIO</td>
<td>0.0140</td>
<td>-0.0193</td>
<td>0.244***</td>
<td>-7.450</td>
</tr>
<tr>
<td></td>
<td>(0.0730)</td>
<td>(0.0298)</td>
<td>(0.0140)</td>
<td>(2.930)</td>
</tr>
<tr>
<td>LOGMVALUEOFQUITY</td>
<td>1.116</td>
<td>0.000941</td>
<td>-0.583</td>
<td>2.752***</td>
</tr>
<tr>
<td></td>
<td>(1.414)</td>
<td>(0.576)</td>
<td>(0.403)</td>
<td>(0.801)</td>
</tr>
<tr>
<td>TDEBT</td>
<td>-4.85e-09</td>
<td>-5.57e-09</td>
<td>-0</td>
<td>0.0229</td>
</tr>
<tr>
<td></td>
<td>(1.55e-08)</td>
<td>(8.85e-09)</td>
<td>(4.21e-09)</td>
<td>(0.0149)</td>
</tr>
<tr>
<td>Constant</td>
<td>2.413</td>
<td>4.066</td>
<td>0.171</td>
<td>1.221e+07***</td>
</tr>
<tr>
<td></td>
<td>(7.761)</td>
<td>(3.094)</td>
<td>(2.011)</td>
<td>(4.148e+06)</td>
</tr>
<tr>
<td>Observations</td>
<td>68</td>
<td>69</td>
<td>62</td>
<td>67</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.336</td>
<td>0.632</td>
<td>0.963</td>
<td>0.982</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

For descriptive findings of Malaysian firms, Table 6 reflects the mean score, deviation from the mean, minimum and maximum values. Regression findings are presented under table 7. It is found that for dividend payout ratio, debt ratio has its significant and positive influence with the coefficient of .234 and standard error of .0127 respectively. Through market value of equity, DPR has a significant but negative influence of -.797 with error of .259. the rest of the indicators for cost of capital for Malaysian firm is insignificant. As per explained variation, market value of equity is creating 94.7 percent variation in DPR and 82.9 percent is observed for interest payment through SIZE.

### Table 6. Descriptive Statistics for Malaysian Firms

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs</th>
<th>Mean</th>
<th>Std.Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>FPCR</td>
<td>62</td>
<td>1.4</td>
<td>1.226</td>
<td>.038</td>
<td>4.847</td>
</tr>
<tr>
<td>ICR</td>
<td>68</td>
<td>6.666</td>
<td>.289</td>
<td>6.165</td>
<td>7.157</td>
</tr>
<tr>
<td>DIVIDENDPR</td>
<td>62</td>
<td>2.033</td>
<td>1.096</td>
<td>.5</td>
<td>4.33</td>
</tr>
<tr>
<td>INTERESTP</td>
<td>63</td>
<td>6854</td>
<td>17.012</td>
<td>3572</td>
<td>8920</td>
</tr>
<tr>
<td>SIZE</td>
<td>62</td>
<td>8530000</td>
<td>1.60e+07</td>
<td>16778</td>
<td>6.46e+07</td>
</tr>
<tr>
<td>M2BRATIO</td>
<td>61</td>
<td>1.53</td>
<td>2.43</td>
<td>.631</td>
<td>3.650</td>
</tr>
<tr>
<td>RROR</td>
<td>65</td>
<td>.861</td>
<td>.479</td>
<td>.12</td>
<td>2.86</td>
</tr>
<tr>
<td>BETA</td>
<td>65</td>
<td>.658</td>
<td>.218</td>
<td>.36</td>
<td>1.1</td>
</tr>
<tr>
<td>INF</td>
<td>62</td>
<td>6.892</td>
<td>.829</td>
<td>5.43</td>
<td>8.34</td>
</tr>
<tr>
<td>DEBTRATIO</td>
<td>63</td>
<td>8.25</td>
<td>3.582</td>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td>LOGMVALUEOFY</td>
<td>65</td>
<td>4.438</td>
<td>1.236</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>TDEBT</td>
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<td>1.56e+07</td>
<td>2.52e+07</td>
<td>1740000</td>
<td>1.03e+08</td>
</tr>
</tbody>
</table>
Table 7. Regression Findings for Manufacturing Firms in Malaysia

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>FPCR:MALAYSIA</th>
<th>ICR:MALAYSIA</th>
<th>DPR:MALAYSIA</th>
<th>INTP:MALAYSIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>M2BRATIO</td>
<td>-3.14e-08</td>
<td>7.24e-09</td>
<td>4.10e-09</td>
<td>-0.00256</td>
</tr>
<tr>
<td></td>
<td>(3.76e-08)</td>
<td>(7.75e-09)</td>
<td>(1.36e-08)</td>
<td>(0.0310)</td>
</tr>
<tr>
<td>RROR</td>
<td>-0.245</td>
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<td>0.108</td>
<td>-166,723</td>
</tr>
<tr>
<td></td>
<td>(0.446)</td>
<td>(0.0936)</td>
<td>(0.137)</td>
<td>(238,185)</td>
</tr>
<tr>
<td>BETA</td>
<td>-0.961</td>
<td>0.685</td>
<td>2.300</td>
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</tr>
<tr>
<td></td>
<td>(3.687)</td>
<td>(1.352)</td>
<td>(1.691)</td>
<td>(4.273e+06)</td>
</tr>
<tr>
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<td>0.729</td>
<td>-0.0975</td>
<td>0.304</td>
<td>-583,921</td>
</tr>
<tr>
<td></td>
<td>(0.528)</td>
<td>(0.191)</td>
<td>(0.225)</td>
<td>(694,643)</td>
</tr>
<tr>
<td>DEBTRATIO</td>
<td>0.0268</td>
<td>-0.0198</td>
<td>0.234***</td>
<td>3.024</td>
</tr>
<tr>
<td></td>
<td>(0.0636)</td>
<td>(0.0132)</td>
<td>(0.0127)</td>
<td>(40,075)</td>
</tr>
<tr>
<td>LOGVALUEOFEQUITY</td>
<td>0.312</td>
<td>-0.0635</td>
<td>-0.797***</td>
<td>597,417</td>
</tr>
<tr>
<td></td>
<td>(0.609)</td>
<td>(0.200)</td>
<td>(0.259)</td>
<td>(726,886)</td>
</tr>
<tr>
<td>SIZE</td>
<td>4.36e-08</td>
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<td>-7.98e-09</td>
<td>0.0526*</td>
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<tr>
<td></td>
<td>(3.33e-08)</td>
<td>(7.02e-09)</td>
<td>(1.28e-08)</td>
<td>(0.272)</td>
</tr>
<tr>
<td>TDEBT</td>
<td>-5.78e-08</td>
<td>7.53e-09</td>
<td>-4.13e-10</td>
<td>0.0199</td>
</tr>
<tr>
<td></td>
<td>(5.85e-08)</td>
<td>(1.32e-08)</td>
<td>(1.80e-08)</td>
<td>(0.0794)</td>
</tr>
<tr>
<td>Constant</td>
<td>-3.867</td>
<td>7.190***</td>
<td>-0.0135</td>
<td>3.785e+06</td>
</tr>
<tr>
<td></td>
<td>(3.193)</td>
<td>(1.334)</td>
<td>(1.477)</td>
<td>(3.941e+06)</td>
</tr>
</tbody>
</table>

Observations       68  62  68  3
R-squared          0.394  0.334  0.947  0.829

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8 indicates the effect of selected explanatory variables on various items of cost of both debt and equity capital in the region of Malaysia. It is observed that effect of log for market value of equity has its significant and negative influence on dividend payout ratio with the coefficient of -.797 and standard error of .259 while through debt ratio effect on DPR is .234 and standard error of -.0127. In addition, effect of size on interest payment is .0526, indicating significantly positive influence on it. The rest of the variables are found to be insignificant for all factors of cost of capital in Malaysian firms.

Table 8. Descriptive Statistics for Manufacturing Firms in Thailand

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs</th>
<th>Mean</th>
<th>Std.Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>FPCR</td>
<td>68</td>
<td>1.748</td>
<td>1.568</td>
<td>.068</td>
<td>6.79</td>
</tr>
<tr>
<td>ICR</td>
<td>70</td>
<td>6.009</td>
<td>.543</td>
<td>5.282</td>
<td>7.599</td>
</tr>
<tr>
<td>DIVIDENDPR</td>
<td>69</td>
<td>1.88</td>
<td>.587</td>
<td>.5</td>
<td>4.33</td>
</tr>
<tr>
<td>INTERESTP</td>
<td>68</td>
<td>10700</td>
<td>9.354</td>
<td>2778</td>
<td>15324</td>
</tr>
<tr>
<td>SIZE</td>
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<td>6.3687</td>
<td>10440</td>
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</tr>
<tr>
<td>M2BRATIO</td>
<td>59</td>
<td>1.38e+07</td>
<td>3.28e+07</td>
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<td>1.67e+08</td>
</tr>
<tr>
<td>RROR</td>
<td>62</td>
<td>12.479</td>
<td>24.344</td>
<td>.02</td>
<td>139.47</td>
</tr>
<tr>
<td>BETA</td>
<td>69</td>
<td>.672</td>
<td>.192</td>
<td>.36</td>
<td>1.16</td>
</tr>
<tr>
<td>INF</td>
<td>69</td>
<td>6.974</td>
<td>.989</td>
<td>5.19</td>
<td>8.54</td>
</tr>
<tr>
<td>DEBTRATIO</td>
<td>68</td>
<td>8.122</td>
<td>3.066</td>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td>LOGVALUEOEQ</td>
<td>67</td>
<td>4.592</td>
<td>1.117</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>TDEBT</td>
<td>63</td>
<td>1.44e+08</td>
<td>2.76e+08</td>
<td>2432</td>
<td>1.10e+09</td>
</tr>
</tbody>
</table>
For the business firms working in the region of Thailand, effect of size on interest covered ratio and overall interest payment is significant and positive with the coefficient of 4.55 and 0.242 respectively, while, market to book ratio indicates an effect of 0.0809 on interest payment. It is observed that required rate of return RROR is highly and significantly affecting interest payment in Thailand. It means increasing required return indicates its direct influence on interest payments in Thailand. Through systematic risk or Beta, fixed payment covered ratio has a positive effect of 15.50 with standard error of 6.870. While more inflation in the economy is leading towards more dividend payout ratio. Through debt ratio, DPR has a significant and positive influence with the coefficient of 0.229 (Table 9, Table 10).

Table 9. Regression Findings for Manufacturing Firms in Thailand

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>FPCR:THAILAND</th>
<th>ICR:THAILAND</th>
<th>DPR:THAILAND</th>
<th>INT:THAILAND</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIZE</td>
<td>3.52e-09</td>
<td>4.54e-08***</td>
<td>-2.17e-09</td>
<td>0.242***</td>
</tr>
<tr>
<td></td>
<td>(4.38e-08)</td>
<td>(9.93e-09)</td>
<td>(7.34e-09)</td>
<td>(0.0456)</td>
</tr>
<tr>
<td>M2BRATIO</td>
<td>3.21e-08**</td>
<td>4.80e-09</td>
<td>3.42e-09</td>
<td>0.0809***</td>
</tr>
<tr>
<td></td>
<td>(1.34e-08)</td>
<td>(3.04e-09)</td>
<td>(2.25e-09)</td>
<td>(0.0140)</td>
</tr>
<tr>
<td>RROR</td>
<td>-0.00620</td>
<td>-0.000384</td>
<td>-0.00113</td>
<td>15.436***</td>
</tr>
<tr>
<td></td>
<td>(0.00839)</td>
<td>(0.00190)</td>
<td>(0.00141)</td>
<td>(4.747)</td>
</tr>
<tr>
<td>BETA</td>
<td>15.50**</td>
<td>-0.343</td>
<td>-1.671</td>
<td>3.408e+06</td>
</tr>
<tr>
<td></td>
<td>(6.870)</td>
<td>(1.558)</td>
<td>(1.152)</td>
<td>(7.159e+06)</td>
</tr>
<tr>
<td>INF</td>
<td>0.549</td>
<td>-0.228</td>
<td>0.252*</td>
<td>-446,085</td>
</tr>
<tr>
<td></td>
<td>(0.860)</td>
<td>(0.195)</td>
<td>(0.144)</td>
<td>(896,653)</td>
</tr>
<tr>
<td>DEBTRATIO</td>
<td>0.0355</td>
<td>-0.00288</td>
<td>0.229***</td>
<td>45,357</td>
</tr>
<tr>
<td></td>
<td>(0.0613)</td>
<td>(0.0139)</td>
<td>(0.0103)</td>
<td>(63,887)</td>
</tr>
<tr>
<td>LOGMVVALUEOFEQUITY</td>
<td>-2.066*</td>
<td>0.0555</td>
<td>-0.190</td>
<td>-700,750</td>
</tr>
<tr>
<td></td>
<td>(1.046)</td>
<td>(0.237)</td>
<td>(0.175)</td>
<td>(1.090e+06)</td>
</tr>
<tr>
<td>TA</td>
<td>-6.61e-09</td>
<td>3.83e-09</td>
<td>-1.03e-09</td>
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<tr>
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<td>(9.36e-09)</td>
<td>(2.12e-09)</td>
<td>(1.57e-09)</td>
<td>(0.00975)</td>
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<tr>
<td>TDEBT</td>
<td>2.95e-09</td>
<td>-4.65e-10</td>
<td>5.11e-10</td>
<td>-0.622</td>
</tr>
<tr>
<td></td>
<td>(2.60e-09)</td>
<td>(5.91e-10)</td>
<td>(4.37e-10)</td>
<td>(0.971)</td>
</tr>
<tr>
<td>Constant</td>
<td>-3.760</td>
<td>7.207***</td>
<td>3.732***</td>
<td>2.642e+06</td>
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<tr>
<td></td>
<td>(5.826)</td>
<td>(1.321)</td>
<td>(0.977)</td>
<td>(6.070e+06)</td>
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<tr>
<td>Observations</td>
<td>49</td>
<td>49</td>
<td>49</td>
<td>49</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.524</td>
<td>0.796</td>
<td>0.955</td>
<td>0.907</td>
</tr>
</tbody>
</table>

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 10. Descriptive Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs</th>
<th>Mean</th>
<th>Std.Dev.</th>
<th>Min</th>
<th>Max</th>
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<td>ICR</td>
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<td>5.998</td>
<td>1.02</td>
<td>4.48</td>
<td>7.528</td>
</tr>
<tr>
<td>DIVIDENDPR</td>
<td>69</td>
<td>1.861</td>
<td>1.014</td>
<td>.5</td>
<td>4.33</td>
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<td>INTERESTP</td>
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<td>M2BRATIO</td>
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<td>1.65e+07</td>
<td>4.02e+07</td>
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<td>1.56e+08</td>
</tr>
<tr>
<td>RROR</td>
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<td>6.436</td>
<td>13.288</td>
<td>.17</td>
<td>72.24</td>
</tr>
<tr>
<td>BETA</td>
<td>63</td>
<td>.678</td>
<td>.196</td>
<td>.36</td>
<td>1.12</td>
</tr>
<tr>
<td>INF</td>
<td>68</td>
<td>6.543</td>
<td>.91</td>
<td>4.97</td>
<td>8.33</td>
</tr>
<tr>
<td>DEBTRATIO</td>
<td>65</td>
<td>7.531</td>
<td>3.373</td>
<td>3</td>
<td>13</td>
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</tbody>
</table>
For the business firms (Table 11), working in Singapore, effect through size on interest covered ratio and dividend payout ratio is significantly negative and significantly positive.

Table 11. Regression Findings for Manufacturing Firms in Singapore

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>FPCR:SINGAPORE</th>
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<th>DPR:SINGAPORE</th>
<th>INTP:SINGAPORE</th>
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</thead>
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<td>2.15e-08**</td>
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</tr>
<tr>
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<td>(4.51e-08)</td>
<td>(1.35e-08)</td>
<td>(1.06e-08)</td>
<td>(0.0669)</td>
</tr>
<tr>
<td>M2BRATIO</td>
<td>7.87e-08</td>
<td>3.33e-09</td>
<td>3.35e-08**</td>
<td>0.100</td>
</tr>
<tr>
<td></td>
<td>(9.58e-08)</td>
<td>(1.76e-08)</td>
<td>(1.38e-08)</td>
<td>(0.0869)</td>
</tr>
<tr>
<td>RROR</td>
<td>-0.0112</td>
<td>0.0584**</td>
<td>-0.00955</td>
<td>-16,997</td>
</tr>
<tr>
<td></td>
<td>(0.0404)</td>
<td>(0.0223)</td>
<td>(0.00277)</td>
<td>(17,476)</td>
</tr>
<tr>
<td>BETA</td>
<td>7.345</td>
<td>1.446</td>
<td>-1.917</td>
<td>4.524e+06</td>
</tr>
<tr>
<td></td>
<td>(5.231)</td>
<td>(2.638)</td>
<td>(1.997)</td>
<td>(1.262e+07)</td>
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<tr>
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</tr>
<tr>
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<td>(0.933)</td>
<td>(0.372)</td>
<td>(0.268)</td>
<td>(1.694e+06)</td>
</tr>
<tr>
<td>DEBTRATIO</td>
<td>0.0290</td>
<td>-0.00467</td>
<td>0.242***</td>
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</tr>
<tr>
<td></td>
<td>(0.0298)</td>
<td>(0.0148)</td>
<td>(0.0112)</td>
<td>(70,586)</td>
</tr>
<tr>
<td>LOGMVALUEOFSEQUITY</td>
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<td>-0.119</td>
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</tr>
<tr>
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<td>(0.944)</td>
<td>(0.425)</td>
<td>(0.318)</td>
<td>(2.010e+06)</td>
</tr>
<tr>
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<td>-3.66e-08</td>
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<td>-3.72e-09</td>
<td>0.0320</td>
</tr>
<tr>
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<td>(3.02e-08)</td>
<td>(.8009)</td>
<td>(4.55e-09)</td>
<td>(0.0287)</td>
</tr>
<tr>
<td>Constant</td>
<td>-7.789</td>
<td>-2.115</td>
<td>3.003*</td>
<td>6.402e+06</td>
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<td>(5.170)</td>
<td>(2.316)</td>
<td>(1.703)</td>
<td>(1.076e+07)</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

While ROR has significantly positive influence on interest covered ratio. In addition, effect through inflation on fixed payment covered ratio and interest covered is significantly positive. Debt ratio indicates a coefficient of .242 and standard error of -.0112, significant at 1 percent. The rest of the factors have their insignificant impact on related factors of cost of capital.

6. Conclusion

This study has empirically examined the impact of size factor, required rate of return, market to book ratio, market value of equity, systematic risk, and total debt on cost of capital. For cost of capital, factors like fixed payment covered ratio, interest covered ratio, and overall interest payment, and dividend payout ratio are added in regression models. Overall five regions from ASEAN members have been selected while taking a sample of 10 firms, over last seven years. For business firms working in Brunei, effect of required return on interest covered ratio and dividend payout ratio is significantly negative. Debt ratio has its significantly positive influence on dividend payout. Log value of equity indicates a negative influence. Total debt has a significant but positive influence on ICR. For the firms working in Indonesia, significant determinant for fixed payment is size, and for both fixed payment and interest covered is market to book ratio. Effect of beta on interest payment is significantly
negative. For the firms working in the region of Malaysia, debt ratio and market value of equity has its significant and positive (negative) effect on dividend payout ratio. Besides, size is found to be significantly determinant of interest payment as debt cost. For the firms, working in Thailand, size is found to be significant determinant of interest covered through EBIT and overall interest payment. Required rate of return found to be a significant determinant of interest payment. While debt ratio has its significant influence for DPR. For the firms, working in Singapore, effect on ICR and DPR is found to be significant through size factor. While market to book ratio is directly affecting the dividend payout. Besides inflation and debt ratio are significantly related to interest covered and dividend payout for the firms working in Singapore. These findings are providing a new insight in the literature of finance and financial management. Both theoretical and practical significance of the study can be viewed through provision of literature discussion and empirical findings. Policy makers, financial analysts, and other industry experts can utilize these findings as a meaningful source for strategic decision. However, future studies can be reconsidered remaining countries in ASEAN region and better sample size of the firms.

References


Flannery, M. J. (2016). Stabilizing large financial institutions with contingent capital certificates. Quarterly Journal of Finance, 6(02), 1650006. Available at: https://doi.org/10.1142/s2010139216500063


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TOWARDS CRISES PREVENTION: FACTORS AFFECTING LENDING BEHAVIOUR

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Abstract. The purpose of this study is to examine the behavior of bank lending in ASEAN economies. For this purpose, macroeconomic and bank related factors are identified from existing literature, defining the lending behavior. Data is collected from official sources like web pages, company’s annual report and online databases. A sample of five banking firm from four ASEAN economies is collected over 2011-2017 with annual observations. Regression analysis indicates the fact that both macroeconomic factors (GDP growth, inflation) are playing their significant role in defining the lending behavior of bank as measured through net loans and unused commitments. From bank related variables, liquidity ratio, risk, return on assets and equity are found to be significant determinant for bank lending. it is highly suggested that credit managers in banking firms, and related departments should use these findings as documentary evidence for the future decision making. Additionally, these findings are also useful facts for country administration, dealing with the macroeconomic factors and their direct influence on bank lending. However, various limitations are also observed which can be addressed in upcoming research studies. Sample size is limited to five banking firms from each state with seven years of time period. At second, specific macroeconomic and bank related measures are used which can be expanded in coming studies.

Keywords: lending behaviour; GDP growth; inflation; return on assets; return on equity; risk


JEL Classifications: F30, F43, P24

1. Introduction and Background

For the economic growth and financial well-being, role of banking sector is very much significant. Transmission of monetary polices are directed linked to the banks because of their crucial role. Overall effect of various policies defined by the government are directly or indirectly defined by the lending behavior (Barajas, Chami, Ebeke, & Oeking, 2018; Ciccarelli, Maddaloni, & Peydró, 2015; Eze, 2018; Fengyang, 2018). Recent economic and financial crisis in the world economy defines the situation that banking sector can lead the major financial markets into financial uneven situations (Sornette, 2017; Tvaronavičienė et al., 2018; Hussain, Grabara, Razimi, & Sharif, 2019). For promoting the economic growth, it is observed that major banking firms in the world economy has injected significant amount of loans and commercial funds (Webb & Martin, 2017; Zhang, Cai, Dickinson, & Kutan, 2016; Hsiao et al, 2017; Iyede et al, 2018). In this regard, role of bank lending behavior plays a major role. For banking sector regulators, sustaining financial stability in banking sector is very much imperative. Basel committee on banking supervision or BCBS has defined various policies and technical proce-
dures to cover the banking firms from financial uneven shocks. Banking regulations like Basel accord I, II, and III indicates the fact that there should be sufficient amount of capital which can secure the banks from future abnormal situation. Meanwhile, lending behavior of the banks indicates the way banking firms are reacting in the economy through set of variables. Bank lending indicates the ability of the banks to provide credit facility to various creditors in the market. In this regard, credit growth provides a comprehensive view for the firm’s capacity to provide loan in the market place. This study has empirically examined the lending behavior of banking firms in ASEAN economies through both bank specific variables and regional economic indicators. Overall format this research is as follows: section two describe literature context. Section three covers description of the variables. Section four explains sample and methods. Section five discusses results and key findings. Last section indicates conclusion and future recommendations.

2. Literature Review

Numerous studies have explored the lending behavior of banking firms, both in emerged and developing economies. For instance, (Kim & Sohn, 2017) have used the data for the commercial banks working in the region of United States to examine whether the capital of the bank affect the lending behavior with the level of liquidity. They have found the fact that increase in credit growth is observed through banking capital amount. Meanwhile, there exists a positive association between the liquidity position of the banks and lending attitude. Their findings suggested the fact that capital of the bank put a significant and positive impact on lending when large banking firms keep higher liquid assets. Vo (2018) sheds the light on the lending behavior of banking firms, working in Vietnam which is known an emerging market. It is observed that most of the emerging economies are getting more economic growth through lending facilities from the banks. Considering a sample of banking firms in Vietnam, he has found that bank related factors are significantly associated to the lending behavior. Meanwhile it is expressed that market structure has also a significant impact on bank lending. Author also explains that targeted economy in his study is facing higher amount of nonperforming loans.

Alper, Binici, Demiralp, Kara, and ÖZLÜ (2018) indicates that reserve requirements in emerging economies provide them smooth credit facilities, however, concept of transmission is yet to be examined. For this purpose, they have used the bank level data to study the behavior of bank lending with the interaction of reserves. They have identified a new insight for the decline in liquidity and more loan facility due to excessive reserves in banks. Besides, authors have indicated the idea of “quantitative tightening” with the help of reserve requirements which can affect the liquidity position of banks. Therefore, liquidity position of the banks have their direct influence on lending behavior. Xie, Zhang, and Song (2019) used the branch level data for the national bank of China to explore the relationship between bank lending and competition among the banking firms. It is observed that inter banking competition is directly associated with the amount of large loans and their maturity. Their findings suggest that to get the competitive advantage in the banking industry, employees increase the volume of loan through creating longer behavior with the borrowers.

Louhichi and Boujelbene (2017) compare the financing/lending behavior in both Islamic and conventional banking firms. They have found that during the time of financial crisis, capital reserve through Tier 1 plays its role as buffer against loss of bank. While both conventional and Islamic banking firms explains different financing behavior. It is suggested that Islamic banking firms needs regulatory framework due to some special structure of funding. Hyun and Uddin (2016) explains that due to significant growth of loans, the idea of loan growth is bigger in size, comparatively to loan contraction as substantial loan redistribution present in financial market of Bangladesh. Additionally, heterogeneity in lending of the bank exists, based on the type of ownership. Fatouh, Markose, and Giansante (2019) consider the idea of quantitative easing as core measure of bank lending in UK banking industry. They have applied agent based computational economics model indicating that there exists significant association between quantitative easing and level of lending in UK. In addition authors like (Behr, Norden, & Noth, 2013; Ge, et al, 2018; George & Georgios, 2017; Guirguis, 2018; Włodarczyk et al., 2019) explore the financial constraints for private business firms and behavior of bank lending. Some other
authors also show their significant interest towards the bank lending & country factors (Barrell & Nahhas, 2019), local and global bank lending (Vause & von Peter, 2011), learning through lending by banks (Botsch & Vanasco, 2019; Cohen, 1983; Darmouni & Sutherland, 2018; Jones, 2007; Koford & Tschoegl, 1999; Malekpirbazari & Aksakalli, 2015; Modarres, Ibrahim, Louie, & Paisley, 2018), quality of capital, bank lending and financial crisis (Cowling, Marlow, & Liu, 2019; Illes, Lombardi, & Mizen, 2015; Košak, Li, Lončarski, & Marinč, 2015; Puddu & Waelchli, 2015), crowding out, political interference and bank lending (Kumar, 2019; Gyebi et al, 2013; Handa, 2018; Chang’auch, 2018).

In the literature context, the relationship between bank lending behavior and financial crisis is also explored in range of studies. For instance, (Košak et al., 2015; Abdullah et al., 2019) have indicates that bank lending activity during the time of global financial crisis is highly related to the quality of the bank capital. Whereas, bank capital under the title of Tier 1 was very crucial towards the bank lending during the time of financial crisis. However, in case of developing countries there is a positive influence of bank capital under Tier 1 has a positive link with bank lending during crisis period. Meanwhile some other studies have also explored this relationship (Bernanke, 1983; Charumilind, Kali, & Wiwattanakantang, 2006; Ivashina & Scharfstein, 2010; Kapan & Minoiu, 2013). To the best of author’s study, this research is providing its contribution among initial works to study the lending behavior under bank specific and regional economic indicators (Table 1). The above-mentioned studies have targeted developed and emerging economies, but little attention towards ASEAN members.

Table 1. Description of Variables

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Definition</th>
<th>Official measurement</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Loans and Unused commitments (Growth)</td>
<td>Indicates the growth of overall loans in the banking sector, along with those loan commitments which are not used by banks</td>
<td>Annual growth rate of net loans+ unused commitments</td>
<td>(Kim &amp; Sohn, 2017)</td>
</tr>
<tr>
<td>Growth of Net Loans</td>
<td>Indicates the growth of overall loans in the banking sector,</td>
<td>Annual growth rate of net loans</td>
<td>(Cucinelli, 2015)</td>
</tr>
<tr>
<td>GDPG</td>
<td>Indicates growth rate of annual gross domestic product</td>
<td>Annual GDP (% of growth)</td>
<td>(Chudik, Mohaddes, Pesaran, &amp; Raissi, 2018)</td>
</tr>
<tr>
<td>INF.</td>
<td>Indicates gradual increase in prices of goods and services</td>
<td>Annual consumer price index</td>
<td>(Nyoni, 2019)</td>
</tr>
<tr>
<td>BANKSIZE</td>
<td>Shows overall assets of the bank in a time</td>
<td>Measured through log of total assets</td>
<td>(Laevens, Ratnovski, &amp; Tong, 2016)</td>
</tr>
<tr>
<td>LIQUIDITRATIO</td>
<td>Defines the firm’s ability to meet its short-term liabilities through current assets</td>
<td>Measured through current assets/current liabilities</td>
<td>(Alper et al., 2018)</td>
</tr>
<tr>
<td>RISK</td>
<td>Level of uncertainty in the business</td>
<td>Measured through level of provision for credit risk</td>
<td>(Vo, 2018)</td>
</tr>
<tr>
<td>ROA</td>
<td>Indicates the firm’s ability to generate revenue through its assets</td>
<td>Net income after tax/total assets</td>
<td>(Gitman, Juchau, &amp; Flanagan, 2015; Kamran et al., 2016)</td>
</tr>
<tr>
<td>ROE</td>
<td>Shows the firm’s capacity to generate revenue through its common stock equity</td>
<td>Net income after tax/total common stock equity</td>
<td>(Abraham, Harris, &amp; Auerbach, 2017)</td>
</tr>
</tbody>
</table>

3. Sample and Research Methodology

Present study is based on quantitative research. For this purpose, sample of selected banking firms is collected from four ASEAN economies; Brunei Malaysia, Indonesia and Thailand. Five banking firms from each region are selected over a period of 2011 to 2017 with annual observation of maximum 35. After finalizing the sample firms, data is collected from official sources of the banks, web portals, and annual reports for bank specific indicators. Data for regional economic factors like GDP and Inflation is collected from World Bank database known as world development indicator. To analyze the lending behavior of banks, robust regression method is applied, considering net loans and unused commitments and net loans as lending dimensions.
4. Results and Discussion

Table 2 reflects the effect of both economic indicators and bank-based factors, affecting the lending behavior in Brunei. Model 1 considers both bank-based and macroeconomic indicator under the title of gross domestic product as percentage of growth, and inflation in the economy through consumer price index to check the lending behavior. It is observed that gross domestic product has its significantly positive impact on banking lending in Brunei, explaining the fact that more growth of domestic product is leading towards more bank lending through growth of net loans plus unused commitments is observed. This effect is significant at 1 percent. While effect of inflation as measured through CPI indicates a negatively significant influence on growth of net loans & unused commitments in Brunei. It means that higher inflation is leading towards lowering the bank lending because of discoursing through the more cost of interest for borrowings. The factor of bank size as measured through total assets shows a positive influence on lending through coefficient of 6.64 and standard error of .914. It explains that increasing in the size for the banking sector in Brunei has its significant and positive influence. Through liquid ratio, effect of bank lending is negative but insignificant, showing the fact that liquidity position for the banks in Brunei has no influence on growth of net loans with unused commitments. The factor of risk indicates a negative and significant influence on bank lending with the coefficient of -.224, significant at 1 percent chance of error. It means that more risk in banking industry is negatively affecting the lending for the banks.

Model two considers the growth of net loans & unused commitments only for the macroeconomic indicators; GDP and inflation. It is observed that both factors have their significant influence on loan increasing GDP has its significant and positive influence with the coefficient of 8.626 while inflation has a significant but negative influence on growth of loans. From bank related factors, only the effect of risk and ROE is found to be significant for the firms working in Brunei. The effect of higher risk indicates lower growth of the loans and unused commitments, but ROE indicates increasing trend and direct influence on loans growth. Model four considers the effect of growth of net loans and their growth. It is found that inflation has a significant and negative impact of -.130 on loan amount. The rest of the indicators are found to be insignificant for the growth of net loans. Under model five, both macroeconomic indicators are observed for the examining the behavior of bank lending. Effect of inflation is -.152 with the standard error of .0515, significant at 5 percent. Through bank size under model six of growth of net loans, significant and positive impact of 9.15 is observed. It means that more growth of the bank in size leading to an increasing trend in bank lending. Factor of risk also indicates its significant and negative influence on net growth of loans for the banking firms of Brunei.

Table 3 shows the behavior of bank lending for Malaysian firms. Effect of macro factor like GDP growth has shown coefficient of .402, significant at 5 percent. It means that more growth to GDP in Malaysian economy pushing a direct impact on bank lending with the increase in economic and financial activities. Through Inflation, effect for the growth of loans with unused commitment is significantly negative. It means that more inflation in Malaysian economy can adversely affect the bank lending facility due to more cost of borrowing. Besides, effect of return on equity is 7.781, indicating more profitable business operations by the banks and return on common stock is leading towards more growth of loans and unused commitments. Model two under table 2 considers only macroeconomic determinant of credit facility. Both factors have shown their significantly positive (negative) impact on bank loan. The factor of risk under model 3 indicates highly significant and negative influence on bank lending. Growth of only net loans as outcome factor is observed under model 4-6. Model four reflects that only the effect of liquid ratio and risk is significant for the growth of net loans for the banking firms of Malaysia. Under model five, effect of GDPG is significantly positive for bank lending. Under model six, effect of risk is significantly positive, means that more risk in bank is leading towards more growth of net loans in Malaysia. Lending behavior of banking firms in Malaysia is presented in Table 3.
### Table 2. Lending behavior of banking firms in Brunei

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>GDPG</td>
<td>8.037***</td>
<td>-8.626**</td>
<td>-0.0426</td>
<td>-0.0343</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.611)</td>
<td>(3.861)</td>
<td>(0.0246)</td>
<td>(0.0217)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INF</td>
<td>-1.122**</td>
<td>4.419***</td>
<td>-0.130*</td>
<td>-0.152**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(.514)</td>
<td>(1.158)</td>
<td>(0.0626)</td>
<td>(0.0515)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BANKSIZE</td>
<td>4.64***</td>
<td>0.000136</td>
<td>-1.26e-07</td>
<td>9.15**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(.914)</td>
<td>(0.000122)</td>
<td>(7.03e-07)</td>
<td>(4.507)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LIQUIDRATIO</td>
<td>-0.454</td>
<td>-0.406</td>
<td>-0.00644</td>
<td>0.00153</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.499)</td>
<td>(1.402)</td>
<td>(0.00798)</td>
<td>(0.00860)</td>
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<td></td>
</tr>
<tr>
<td>RISK</td>
<td>-0.224***</td>
<td>-1.024**</td>
<td>-2.113</td>
<td>-2.480***</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>(.6442)</td>
<td>(1.6624)</td>
<td>(1.472)</td>
<td>(.581)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROA</td>
<td>-2.312</td>
<td>-1.005</td>
<td>-0.0244</td>
<td>-0.0333</td>
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</tr>
<tr>
<td></td>
<td>(3.408)</td>
<td>(3.207)</td>
<td>(0.0182)</td>
<td>(0.0197)</td>
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<td></td>
</tr>
<tr>
<td>ROE</td>
<td>-9.163</td>
<td>8.985**</td>
<td>-0.0520</td>
<td>-0.0707</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(8.058)</td>
<td>(4.250)</td>
<td>(0.0429)</td>
<td>(0.0506)</td>
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</tr>
<tr>
<td>Constant</td>
<td>66.56</td>
<td>28.24**</td>
<td>30.44</td>
<td>0.817**</td>
<td>0.406**</td>
<td>0.761**</td>
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<tr>
<td></td>
<td>(49.52)</td>
<td>(9.827)</td>
<td>(46.05)</td>
<td>(0.0553)</td>
<td>(0.283)</td>
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<tr>
<td>Observations</td>
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<td>35</td>
<td>32</td>
<td>35</td>
<td>32</td>
<td>35</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.484</td>
<td>0.270</td>
<td>0.308</td>
<td>0.645</td>
<td>0.439</td>
<td>0.368</td>
</tr>
</tbody>
</table>

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

### Table 3. Lending behavior of banking firms in Malaysia

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>GDPG</td>
<td>0.402***</td>
<td>0.847***</td>
<td>-0.0687</td>
<td>0.0587*</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>(0.114)</td>
<td>(0.0832)</td>
<td>(0.0492)</td>
<td>(0.0317)</td>
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</tr>
<tr>
<td>INF</td>
<td>-3.075**</td>
<td>-0.990***</td>
<td>-0.0706</td>
<td>0.0460</td>
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<td></td>
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<tr>
<td></td>
<td>(1.960)</td>
<td>(.120)</td>
<td>(0.0922)</td>
<td>(0.0657)</td>
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</tr>
<tr>
<td>BANKSIZE</td>
<td>-1.43e-05</td>
<td>-7.37e-06</td>
<td>4.72e-07</td>
<td>1.42e-08</td>
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<tr>
<td></td>
<td>(3.37e-05)</td>
<td>(2.66e-05)</td>
<td>(7.84e-07)</td>
<td>(6.73e-07)</td>
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</tr>
<tr>
<td>LIQUIDRATIO</td>
<td>-1.105</td>
<td>-1.170</td>
<td>-0.194***</td>
<td>-0.0426</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2.130)</td>
<td>(1.861)</td>
<td>(0.0496)</td>
<td>(0.0472)</td>
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<td></td>
</tr>
<tr>
<td>RISK</td>
<td>-52.25</td>
<td>-43.60***</td>
<td>0.345***</td>
<td>0.533***</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>(31.87)</td>
<td>(15.01)</td>
<td>(0.0422)</td>
<td>(0.059)</td>
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</tr>
<tr>
<td>ROA</td>
<td>-0.0772</td>
<td>-0.380</td>
<td>-0.00840</td>
<td>-0.0188</td>
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<tr>
<td></td>
<td>(1.365)</td>
<td>(1.144)</td>
<td>(0.0318)</td>
<td>(0.0290)</td>
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<tr>
<td>ROE</td>
<td>7.781**</td>
<td>-7.321**</td>
<td>-0.0672</td>
<td>-0.0193</td>
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<td></td>
<td>(3.387)</td>
<td>(2.765)</td>
<td>(0.0788)</td>
<td>(0.0701)</td>
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<tr>
<td>Constant</td>
<td>57.36**</td>
<td>8.012</td>
<td>47.92***</td>
<td>0.859*</td>
<td>0.734***</td>
<td>0.701**</td>
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<tr>
<td></td>
<td>(19.84)</td>
<td>(11.90)</td>
<td>(11.03)</td>
<td>(0.462)</td>
<td>(0.206)</td>
<td>(0.280)</td>
</tr>
<tr>
<td>Observations</td>
<td>30</td>
<td>32</td>
<td>35</td>
<td>32</td>
<td>33</td>
<td>32</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.538</td>
<td>0.434</td>
<td>0.518</td>
<td>0.316</td>
<td>0.202</td>
<td>0.154</td>
</tr>
</tbody>
</table>

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
For banking firms of Indonesia, findings are presented under table 4. Both GDP growth and inflation are found to significant determinant of bank lending in Indonesia with coefficient of 17.03 and -16.78 respectively. While bank size is found to be positive determinant of credit growth and unused commitments. Meanwhile liquidity ratio has also presented its significant and negative influence of 8.57 on growth of net loans and unused commitment. Meanwhile effect of risk is -5.24, indicating the fact that more lending is adversely affected by the factor of risk in banking firms of Indonesia. Model two presents significantly positive (negative). Under model 3, effect of bank size is significantly positive with the coefficient of .00078. It means that more increase in bank size leading to more growth of bank loans along unused commitments. Effect on growth of net loans through selected explanatory variable is presented under model 4-6. It is found that effect of inflation and ROA is significantly positive with the coefficients of .0469 and .00472 respectively. Model five indicates that both macroeconomic factors have their significant impact of bank lending. Model six indicates only bank related factors of credit growth. Effect of bank size and liquid ratio is significantly positive and negative.

**Table 4. Lending behavior of banking firms in Indonesia**

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDPG</td>
<td>17.03**</td>
<td>7.468**</td>
<td>-0.118</td>
<td>0.137*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(8.85)</td>
<td>(3.02)</td>
<td>(0.0974)</td>
<td>(0.0728)</td>
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</tr>
<tr>
<td>INF</td>
<td>-16.78***</td>
<td>-4.140***</td>
<td>-0.0469**</td>
<td>-0.0326*</td>
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<tr>
<td></td>
<td>(2.670)</td>
<td>(0.472)</td>
<td>(0.0188)</td>
<td>(0.0177)</td>
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</tr>
<tr>
<td>BANKSIZE</td>
<td>0.00124***</td>
<td>0.000788**</td>
<td>1.17e-06</td>
<td>2.59e-06**</td>
<td></td>
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<tr>
<td></td>
<td>(0.000157)</td>
<td>(0.000286)</td>
<td>(1.10e-06)</td>
<td>(1.14e-06)</td>
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</tr>
<tr>
<td>LIQUIDRATIO</td>
<td>-8.57***</td>
<td>-13.38</td>
<td>-0.0679</td>
<td>-0.138*</td>
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</tr>
<tr>
<td></td>
<td>(2.018)</td>
<td>(15.70)</td>
<td>(0.0634)</td>
<td>(0.0628)</td>
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<tr>
<td>RISK</td>
<td>-5.24**</td>
<td>-43.73</td>
<td>0.390</td>
<td>0.285</td>
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<tr>
<td></td>
<td>(2.28)</td>
<td>(65.96)</td>
<td>(0.234)</td>
<td>(0.264)</td>
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<tr>
<td>ROA</td>
<td>-0.0106</td>
<td>0.393</td>
<td>0.00472*</td>
<td>0.00305</td>
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<tr>
<td></td>
<td>(0.361)</td>
<td>(0.712)</td>
<td>(0.00254)</td>
<td>(0.00285)</td>
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<tr>
<td>ROE</td>
<td>7.155*</td>
<td>-2.311</td>
<td>-0.000256</td>
<td>0.0276</td>
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<td></td>
<td>(3.326)</td>
<td>(6.199)</td>
<td>(0.0234)</td>
<td>(0.0248)</td>
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<tr>
<td>Constant</td>
<td>39.24</td>
<td>111.4</td>
<td>23.70</td>
<td>0.604</td>
<td>0.950**</td>
<td>0.298**</td>
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<tr>
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<td>(68.26)</td>
<td>(140.6)</td>
<td>(30.26)</td>
<td>(0.480)</td>
<td>(0.411)</td>
<td>(0.121)</td>
</tr>
<tr>
<td>Observations</td>
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<td>32</td>
<td>35</td>
<td>32</td>
<td>35</td>
<td>32</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.931</td>
<td>0.382</td>
<td>0.628</td>
<td>0.724</td>
<td>0.336</td>
<td>0.518</td>
</tr>
</tbody>
</table>

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Effect of bank related and macroeconomic factors on bank lending for banking firms of Thailand is presented under table 5. Model 1 shows that effect of economic growth on bank lending through growth of net loans and unused commitment is found to be positively significant with the coefficient of .959 and standard error of .026. While model two shows that both GDP and inflation in Thailand has their significant influence in defining bank lending. GDPG has positive impact while inflation has negative impact. Model observes that from the bank-specific factors, effect of liquid ratio and risk is significantly positive and negative. For the bank lending measure through growth of net loans, model four indicates that GPDG has a direct impact on bank lending in Thailand. While coefficient of risk is 1.364, explaining the fact that more loan growth is observed with increasing amount of risk in Thai banking industry. Model five under table 4 shows the effect of GPD and inflation for the net loan’s growth, which is significant at 1 percent. Model six demonstrates that from both bank related fac-
tors and macroeconomic indicators, bank size has its significant and positive influence on loan growth. While return on equity is also found to be significant determinant with the coefficient of .114 and standard error of .0251 respectively.

Table 5. Lending behavior of banking firms in Thailand

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1) GDPG</th>
<th>(2)-INF</th>
<th>(3) BANKSIZE</th>
<th>(4) LIQUIDRATIO</th>
<th>(5) RISK</th>
<th>(6) ROA</th>
<th>(7) ROE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1: Growth of Net loans &amp; UU Commit</td>
<td>0.959***</td>
<td>0.819*</td>
<td>1.26e-05</td>
<td>0.956</td>
<td>1.186</td>
<td>0.503</td>
<td></td>
</tr>
<tr>
<td>Model 2: Growth of Net loans &amp; UU Commit</td>
<td>0.819*</td>
<td>4.857</td>
<td>1.42e-05</td>
<td>0.512</td>
<td>8.46e-06</td>
<td>-2.885***</td>
<td></td>
</tr>
<tr>
<td>Model 3: Growth of Net loans &amp; UU Commit</td>
<td>0.0632*</td>
<td>1.42e-05</td>
<td>-3.65e-08</td>
<td>0.147</td>
<td>1.69</td>
<td>0.645</td>
<td></td>
</tr>
<tr>
<td>Model 4: Growth of Net loans &amp; UU Commit</td>
<td>0.3481***</td>
<td>0.0773</td>
<td>2.61e-08**</td>
<td>0.116</td>
<td>1.161</td>
<td>0.00981</td>
<td></td>
</tr>
<tr>
<td>Model 5: Growth of Net loans</td>
<td>315</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model 6: Growth of Net loans</td>
<td>2.61e-08**</td>
<td>0.147</td>
<td>0.000453</td>
<td>0.116</td>
<td>0.161</td>
<td>0.00981</td>
<td></td>
</tr>
</tbody>
</table>

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

To examine the lending behavior in overall ASEAN regions, pooled regression findings are presented under table 6.

Table 6. Lending behavior of banking firms overall

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1) GDPG</th>
<th>(2)-INF</th>
<th>(3) BANKSIZE</th>
<th>(4) LIQUIDRATIO</th>
<th>(5) RISK</th>
<th>(6) ROA</th>
<th>(7) ROE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1: Growth of Net loans &amp; UU Commit</td>
<td>0.644**</td>
<td>1.668***</td>
<td>0.843***</td>
<td>0.466</td>
<td>1.186</td>
<td>0.503</td>
<td></td>
</tr>
<tr>
<td>Model 2: Growth of Net loans &amp; UU Commit</td>
<td>1.668***</td>
<td>8.46e-06</td>
<td>1.59e-08</td>
<td>0.512</td>
<td>8.46e-06</td>
<td>-2.228**</td>
<td></td>
</tr>
<tr>
<td>Model 3: Growth of Net loans &amp; UU Commit</td>
<td>0.843***</td>
<td>1.59e-08</td>
<td>-2.161***</td>
<td>0.145</td>
<td>0.102</td>
<td>0.503</td>
<td></td>
</tr>
<tr>
<td>Model 4: Growth of Net loans</td>
<td>-2.777**</td>
<td>0.102</td>
<td>0.102</td>
<td>0.0133</td>
<td>0.102</td>
<td>0.00184</td>
<td></td>
</tr>
<tr>
<td>Model 5: Growth of Net loans</td>
<td>315</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Model 6: Growth of Net loans</td>
<td>0.00184</td>
<td>0.102</td>
<td>0.102</td>
<td>0.0133</td>
<td>0.102</td>
<td>0.00184</td>
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</tbody>
</table>
Model 1 to model 3 indicates growth of net loans and unused commitments, while model 4-6 indicates growth of net loans as main dependent variables of the study. Through GDP coefficient is .644 indicates that increasing growth of GDP in overall ASEAN region is positively affecting the bank lending. While impact of inflation is -2.885, significant at 1 percent, meaning the fact that higher inflationary environment has its significant and adverse impact on lending behavior of banks. From bank specific factors, risk is found to be significant determinant of bank lending. Model two shows that both macroeconomic factors are significantly affecting the net loans and unused commitments. Model three indicates that in ASEAN region, risk is found to be significant determinant when the effect of bank related factors (only) will be examined for the growth of net loans and unused commitments. In addition, for the net loan’s growth, inflation and GDP are significant determinants with coefficients of -.161 and .843 respectively. While model five shows that only inflation has its significant influence on growth of net loans. Model six reflect positive influence of return on assets on bank lending, significant at 1 percent.

5. Conclusions and Recommendations

This study has examined the behavior of bank lending in the region of ASEAN. For this purpose, banking firms from four states (Brunei, Malaysia, Indonesia, and Thailand) have been selected for the secondary data analysis. From macroeconomic factors like GDPG and inflation are selected to determine the growth of credit in banking industry. From bank-specific factors, effect of bank size, liquidity ratio, risk, return on assets and return on equity are observed. Findings through regression analysis indicates that when the effect of all variables are observed for the growth of net loans and unused commitments, GDP, inflation, bank size and risk are significant determinants in Brunei. This assumption is true when only the effect of macro factors is observed for bank loans and unused commitments. When individual effect of bank related factors are observed, significant determinants are risk and ROE. While growth of net loans are found to be significantly affected by inflation only. From bank specific factors, effect of bank size, and risk is significant for the banking firms in Thailand. For banking firms in Malaysia, GDP and inflation are found to be significant indicator of bank lending measured as net loans and unused commitments. From bank related factors alone, effect of risk and ROE is significantly negative. For combine effect of bank related and macroeconomic factors on net loans growth, liquidity ratio and risk are significant determinant. While GDP is found to be positive indicator of bank lending. However, again the individual effect of bank related factors, risk has its significant influence on net loans in Thailand. From the context of Indonesia, GDP, inflation, bank size, liquidity ratio, risk and return on equity are significant determinant of bank lending (net loans and unused commitments). For the banking firms in Thailand, significant determinant is GDP growth when combing effect is examined. While separate effect of GDP and inflation is found to be significantly positive. Separate effect of bank related factors on net loans and unused commitments, effect of liquidity ratio and risk is significant.

With aggregated analysis of bank lending behavior, it is observed that for net loans and unused commitments in ASEAN region, GDP inflation, and risk have their significant impact. While GDP and inflation have their significant impact, when they are examining except with bank related factors. Meanwhile effect of risk from bank related factors for net loans and unused commitments is significant. For growth of net loans, effect of GDP, inflation risk and ROA is found to be significant at 5 percent in overall ASEAN region. Based on these
findings, it is highly suggested that credit managers in banking firms, and related departments should use these findings as documentary evidence for the future decision making. Additionally, these findings are also useful facts for country administration, dealing with the macroeconomic factors and their direct influence on bank lending. However, various limitations are also observed which can be addressed in upcoming research studies. Sample size is limited to five banking firms from each state with seven years of time period. At second, specific macroeconomic and bank related measures are used which can be expanded in coming studies.

References


Darmouni, O., & Sutherland, A. (2018). Learning about Competitors: Evidence from SME Lending. Available at SSRN.


Kapan, M. T., & Minoa, C. (2013). Balance sheet strength and bank lending during the global financial crisis: International Monetary Fund. https://pdfs.semanticscholar.org/368c/e59241b90438e0264bc1c08a7591e68c9e.pdf


intermediation/articles-in-press


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Abstract. The purpose of this study is to examine the impact of women empowerment through board diversity along with governance variables on capital structure and leverage dimensions. To achieve this objective, sample of 35 business firms over 2012-2016 is collected in the region of Thailand. Secondary data approach is implemented with descriptive and regression analysis. It is found that board diversity (presence of female members) is significantly associated to capital structure and leverage pattern. With the presence of firm age, fixed payments and risk factor, this effect is found to be true for total loan and leverage factors but insignificant for the debt to equity ratio. Effect of board size on capital structure and leverage dimensions is also found to be significant. Meanwhile, effect of age on debt ratio and total loan is positively significant but negatively significant for total leverage. Practical significance of the study covers managerial implication in the field of corporate governance and risk-taking behavior through capital structure and leverage.

Keywords: women empowerment, capital structure, corporate governance, leverage


JEL Classifications: D24, G3

1. Introduction and Background

For business firms and economy, reasonable consensus is available for the significance of corporate governance (CG) as it attains much attention in the literature. Recent studies in this field indicates the fact that success factors of business organization is closely associated to CG. The key focus of vast body of literature is on governance mechanism and its impact on the firm performance (Conyon & He, 2008; La Rocca, Montalto, La Rocca, & StaglianÃ, 2017; Zulkifli, Shukor, & Rahman, 2018; Muma, 2018; Mungwari, 2018; Muniisvaran & Vijayalakshmi, 2018; Muñoz, 2017; Myambo & Munyanyi, 2017; Sbaouelgi, 2018; Obiekwe, 2018; Arora & Sharma, 2016; Azeez, 2015; Francis, Hasan, & Wu, 2015; Hasanudin et al., 2019; Esenyel & Emeagwali, 2019).

Business firms working with the weak governance structure have more intensity to face the agency issue, where managers place their personal interest ahead of corporate interest (Bosse & Phillips, 2016). Under the title of agency theory, it is explained that managers are not very much careful about the funds of stakeholders, comparatively to their own (Letza, Sun, & Kirkbride, 2004). Another theory indicates the strong association between the organizational success and satisfaction of shareholders is stewardship theory. Various dimensions
are presented in the literature to cover the basic idea of corporate governance. In this regard, total members in the board expresses the size. It is believing that larger board size can significantly manage the business strategic affairs, comparatively to smaller board size. However, the factor of women empowerment is under observation since last couple years due to its worth in the board through gender diversification. Diversity in the board through gender specifies its impact on the performance (Bear, Rahman, & Post, 2010; Bernardi, Bean, & Weippert, 2002; Boulouta, 2013; Erhardt, Werbel, & Shrader, 2003), but the literature contribution for the women empowerment through board diversification and its linkage to capital structure and leverage is very limited. Women empowerment indicates the actions and raising of status for the female through education, literacy, and job opportunities in the society (Mosedale, 2005; Malimi, 2017; Mohiuddin, 2018; Mokgari & Pwaka, 2018).

In addition, capital structure reflects the financing decision of the business to finance its capital investment projects through debt and equity. Higher portion of debt refers to more usage of external loans with increasing amount of fixed obligations over business. While equity financing indicates the patterns of financing where more funds are availed through issuance of common and preferred shares in the market. One of fundamental point of discussion for the capital structure is leverage which defines the utilization of fixed payment obligations in a way that both risk and return in the business can magnify. Leverage specifies the relationship between sales and operating profit (operating leverage), and between operating profit and earnings per share (financial leverage). Overall leverage adds both the operating and financial leverage. The purpose of this study is to examine the effect of women empowerment through board diversity and governance dimensions on capital structure and leverage of selected firms in Thailand. Besides, effect of firm age, fixed payment ratios, and risk is also evaluated with the governance variables on capital structure and leverage. The rest of the paper is as follows. Next section covers the literature work on the topic. Section three examples the variables and their operational measurement. Section four explains the methods and econometric equations. Section five provides empirical findings and discussion. Last section indicates the conclusory part.

2. Literature Review

The dynamics of capital structure choice and its association with the corporate governance has provided limited empirical evidence. Research study conducted by (Morellec, Nikolov, & Schürhoff, 2012) have empirically developed a dynamic model to explore the association between the conflict of shareholders & manager, based on the choice of capital structure. Research study conducted by (Liao, Mukherjee, & Wang, 2015) have indicated the fact that higher level of financial leverage in the business with the more adjustment through shareholder’s desire is highly associated to better quality of CG. Quality of CG is highly linked to the independent of CEO and greater presence of outside directors in the business. However, it is also found that effect of CG on level of leverage is more pronounced with the initial level of leverage.

As per the findings of trade-off theory, value of the firm is maximum in the form of shareholders wealth when the capital structure of the business reach to the optimal level. This benefit is associated to the tax benefits against the financial distress and cost of debt. Besides, deviation from the level of leverage which is known as optimal can create significant benefit to the business. Some studies have found misbalancing or incomplete leverage rebalancing, based on refinancing cost (Lemmon, Roberts, & Zender, 2008). Research work by (Francis et al., 2015) examines the impact of directors from the academic background and performance of the firm. It is expressed that those directors who entitled as professor can play their significant role in governance structure. Meanwhile higher stock price, lower compensation for the CEO and higher CEO turnover is highly associated to each other. During the period of last decade, (Wen, Rwegasira, & Bilderbeek, 2002) examine the effect of corporate governance indicators and level of capital structure for listed firms in China. It is observed that if business manager tends to pursue lower value of financial leverage, when they have stronger background from board members. This relationship is only acceptable when there is a presence of board composition and tenure of CEO. However, defined association is insignificant with the presence of board size and fixed compensation for CEO.

Kang, Cheng, and Gray (2007) considers the corporate governance, board diversity and factor of independence from the context of Australian companies. Authors explains that most of the studies in stated context covers
US region, hence cannot be generalized. (Chow, Muhammad, Bany-Ariffin, & Cheng, 2018) examine the moderating effect of corporate governance for the relationship between capital structure of the firm and regional economic uncertainty. For this purpose, they have applied two step generalized method of moment regression approach for a sample of 907 listed firms during 2004-2014. Findings of their study reflects the fact that significant & negative effect of regional economic indicator on capital structure with the presence of CG as moderator. Their findings suggest that CG is playing its role as an active mechanism during the time of higher uncertainty. Practical implication of the study reveals that policy makers can formulate the policies to mitigate the adverse effect of regional uncertainties (Zandi & Haseeb, 2019).

Hussainey and Aljifri (2012) examine the impact of CG on financial decision of the business firms in United Arab Emirates (UAE). Specifically, their study explores the internal structure of CG and how external structure of CG can influence on capital structure. Through multiple regression models for 71 listed firms it is found that institutional investors are significantly and negatively affecting the debt to equity ratio for selected firms. However, their findings are not supporting the active monitoring assumption. Empirical analysis also indicates practical implication for the financial firms working in the region of UAE. As per the best knowledge of authors, it is found that no study is yet to be conducted for the association between CG and capital structure in UAE. La Rocca (2007) explores the relationship between corporate governance and capital structure for the value of selected firms through synthetic review of present literature and conceptual discussion. Dimitropoulos (2014) conducts their survey for CG, capital structure from European context. While some other studies have also examined the similar relationship in both developed and developing economies (Sheikh & Wang, 2012; Boateng, Cai, Borgia, Gang Bi, & Ngwu, 2017; Li, Pike, & Haniffa, 2008; Majumdar & Chhibber, 1999; Reddy & Locke, 2014; Suto, 2003; Hussain, Abidin, Ali, & Kamarudin, 2018; Tran et al., 2019). To the best of author’s findings, existing literature is lacking with the empirical contribution from the context of women empowerment through board diversity, CG indicators, capital structure and leverage dimensions in Thailand. This study is trying to fill this gap through empirical assessment of stated variables.

3. Definition of Variables

Details of all variables are as follows:

**Capital structure (CS)**
- Capital structure is main dependent variable, referring the mixture of debt and equity in the balance sheet. To reflect the concept of capital structure, two dimensions under the title of debt ratio and log of total loans in the business are added in econometric models. Debt ratio measures the portion of long terms funds, being used to finance the capital assets. Total loans reflects overall value major loans availed by the business from available sources, where it has to pay interest over regular intervals.

**Leverage (LEV)**
- Leverage refers to the utilization of fixed cost in the business to increase risk and return. Higher leverage means more risk in the business and ultimately more return over equity. Two major components of leverage are presented in existing literature; operating and financial. Operating leverage measures the relationship between sales and earnings before interest and tax. While financial leverage explains the association between EBIT and EPS.

**Corporate Governance (CG)**
- Corporate governance explains overall rules and regulations to govern and run the business firm. It considers the board structure through size of board or number of members in the board, diversity of the board through gender categories, number of outside directors, and non-executive directors. All these measures are considered in the study, specifically board diversity through both male and female members. This factor of diversity indicates the women empowerment and overall corporate culture to strength the women in business firms for a positive image.
Firm Age (FAGE)
- Firm age refers to the time period business is working through its operational activity in the marketplace. It is a common notion that business firms with older age have more experience comparatively to those which are new in the market. Age factor is measured with total number of years from date of incorporation to present.

Fixed payment Ratios
- With the presence of debt and equity financing in the business, fixed payments becomes integral obligations to satisfy on time. For debt, the most common type of fixed payment ratio is interest coverage ratio, reflecting the business ability to satisfy its interest payments through EBIT. At second, fixed payment covered ratio combines the fixed cost like interest, dividend, lease and principal repayment of the loan over time. In addition, dividend payout ratio measures the firm capacity to pay dividend per share to its shareholders while taking the EPS as base.

Risk
- The factor of risk reflects the chance of uncertainty for the firm. Various measures are presented in the literature to cover the title of risk. Present study considers the liquidity measure which explains the ability of the firm to meet its short-term financial obligation at the time when they becomes due. More liquid firms are supposed to stable in financial dimensions.

4. Data, Methods and Equations

Data for the empirical analysis is collected from annual reports of 35 companies, along with other online sources, covering the dimensions of governance structure, capital structure, leverage and fixed payment ratios. Selected firms are from the manufacturing sector in Thailand. Only those firms are selected which have no missing observation over simple period. Due to secondary in nature and quantitative, present study has applied descriptive and regression analysis, for the following econometric equations:

\[ y(\text{capital structure: DEBT\_RATIO}) = \delta + \beta_1(\text{board size: BSIZE}) + \beta_2(\text{board diversity: BDIVERSITY}) + \beta_3(\text{non-executive directors: NED}) + \beta_4(\text{CEO Duality: CEODUALITY}) + \beta_5(\text{outside director: OUTSIDE\_DIRECDTORS}) + \epsilon \]
Equation 1

\[ y(\text{capital structure: LOG\_LTLOAN}) = \delta + \beta_1(\text{board size: BSIZE}) + \beta_2(\text{board diversity: BDIVERSITY}) + \beta_3(\text{non-executive directors: NED}) + \beta_4(\text{CEO Duality: CEODUALITY}) + \beta_5(\text{outside director: OUTSIDE\_DIRECDTORS}) \]
Equation 2

\[ y(\text{LEVERAGE: TOT\_LETV}) = \delta + \beta_1(\text{board size: BSIZE}) + \beta_2(\text{board diversity: BDIVERSITY}) + \beta_3(\text{non-executive directors: NED}) + \beta_4(\text{CEO Duality: CEODUALITY}) + \beta_5(\text{outside director: OUTSIDE\_DIRECDTORS}) \]
Equation 3
\( y(\text{LEVERAGE:FINANCIALLEV}) = \\
\delta + \beta_1(\text{board size:BSIZE}) + \beta_2(\text{board diversity:BDIVERSITY}) \\
+ \beta_3(\text{non-executive directors:NED}) + \beta_4(\text{CEO Duality:CEODUALITY}) + \\
\beta_5(\text{outside director:OUTSIDE_DIRECDTORS}) \\
\) 

Equation 4

\( y(\text{LEVERAGE:OPERATINGLEV}) = \\
\delta + \beta_1(\text{board size:BSIZE}) + \beta_2(\text{board diversity:BDIVERSITY}) \\
+ \beta_3(\text{non-executive directors:NED}) + \beta_4(\text{CEO Duality:CEODUALITY}) + \\
\beta_5(\text{outside director:OUTSIDE_DIRECDTORS}) \\
\) 

Equation 5

\( y(\text{capital structure:DEBT_RATIO}) = \\
\delta + \beta_1(\text{firm age:FAGE}) + \beta_2(\text{interest payment ratio:INTEREST_P_RATIO}) + \\
\beta_3(\text{dividend payout ratio:DPR}) + \beta_4(\text{fixed payment covered ratio:FPCR}) + \beta_5(\text{risk}) + \\
\beta_6(\text{board diversity:BDIVERSITY}) \\
+ \beta_7(\text{board size:BSIZE}) + \beta_8(\text{non-executive directors:NED}) + \\
\beta_9(\text{CEO Duality:CEODUALITY}) + \beta_{10}(\text{outside director:OUTSIDE_DIRECDTORS}) + \epsilon \\
\) 

Equation 6

\( y(\text{capital structure:LOG_LTLOAN}) = \\
\delta + \beta_1(\text{firm age:FAGE}) + \beta_2(\text{interest payment ratio:INTEREST_P_RATIO}) + \\
\beta_3(\text{dividend payout ratio:DPR}) + \beta_4(\text{fixed payment covered ratio:FPCR}) + \beta_5(\text{risk}) + \\
\beta_6(\text{board diversity:BDIVERSITY}) \\
+ \beta_7(\text{board size:BSIZE}) + \beta_8(\text{non-executive directors:NED}) + \\
\beta_9(\text{CEO Duality:CEODUALITY}) + \beta_{10}(\text{outside director:OUTSIDE_DIRECDTORS}) + \epsilon \\
\) 

Equation 7

\( y(\text{LEVERAGE:TOTALLEV}) = \\
\delta + \beta_1(\text{firm age:FAGE}) + \beta_2(\text{interest payment ratio:INTEREST_P_RATIO}) + \\
\beta_3(\text{dividend payout ratio:DPR}) + \beta_4(\text{fixed payment covered ratio:FPCR}) + \beta_5(\text{risk}) + \\
\beta_6(\text{board diversity:BDIVERSITY}) \\
+ \beta_7(\text{board size:BSIZE}) + \beta_8(\text{non-executive directors:NED}) + \\
\beta_9(\text{CEO Duality:CEODUALITY}) + \beta_{10}(\text{outside director:OUTSIDE_DIRECDTORS}) + \epsilon \\
\) 

Equation 8

\( y(\text{LEVERAGE:FINANCAILLEV}) = \\
\delta + \beta_1(\text{firm age:FAGE}) + \beta_2(\text{interest payment ratio:INTEREST_P_RATIO}) + \\
\beta_3(\text{dividend payout ratio:DPR}) + \beta_4(\text{fixed payment covered ratio:FPCR}) + \beta_5(\text{risk}) + \\
\beta_6(\text{board diversity:BDIVERSITY}) \\
+ \beta_7(\text{board size:BSIZE}) + \beta_8(\text{non-executive directors:NED}) + \\
\beta_9(\text{CEO Duality:CEODUALITY}) + \beta_{10}(\text{outside director:OUTSIDE_DIRECDTORS}) + \epsilon \\
\) 

Equation 9
Equation 10

\[ y(\text{LEVERAGE: OPERATING LLEV}) = \delta + \beta_1(\text{firm age: FAGE}) + \beta_2(\text{interest payment ratio: INTEREST P RATIO}) + \beta_3(\text{dividend payout ratio: DPR}) + \beta_4(\text{fixed payment covered ratio: FPCR}) + \beta_5(\text{risk}) +\]
\[+ \beta_6(\text{board diversity: BDIVERSITY}) \]
\[+ \beta_7(\text{board size: BSIZE}) + \beta_8(\text{non-executive directors: NED}) + \beta_9(\text{CEO Duality: CEODUALITY}) + \beta_{10}(\text{outside director: OUTSIDE DIRECCTORS}) + \epsilon \]

Equation 10

5. Results and Discussion

Table 1 expresses descriptive findings through mean score, deviation in the average value, and range of data. Table 2 presents variables. Overall observations for the variables are 210, reflecting no missing observation during time period of interest. For Debt Ratio, average value is 44.891, indicating the fact that most of the firm relies on the 45 percent portion of debt in their total asset’s investment. Deviation in mean score of debt ratio is 2.55 with minimum of 36 and maximum of 56. For log of loan, overall value of long-term debt in the balance sheet of selected firms is observed. Average value is 4.26 while taking the natural log of the data, with the deviation of .620 and maximum value of 6.984. In capital structure decision, factor of leverage plays its significant role as it is associated to the fixed cost payments and magnification of risk retun. Average score of total leverage is 4.058 with the deviation of 1.88. While financial leverage deals with the EBIT and earnings per share. Average value for financial leverage is 6.20 with the standard deviation of .915. For operating leverage, relationship between sales and EBIT is observed over time period of interest. Firm age indicates the time period since business is operating in the market place. Higher the firm experience means more expertise and better competitive advantages over rivals under regular course of action. Average score for the firm age is 15.652 with the deviation of .515. In addition, interest payment ratio (INTEREST P-O), average intensity of the firm to pay interest cost is 6.578 through its operating profit or EBIT. Higher this ratio means more payment for the fixed cost like Interest. For dividend payout ratio (DPR), fixed expense on equity share is observed. Average score for DPR is 4.321 with the deviation of .89. In addition, the factor of fixed payment covered ratio represents all payments which are fixed in nature and firm’s intensity to pay them all. An average value of FPCR is 4.774 with the highest deviation, comparatively to all other variables. The factor of risk has an average score of 3.049 reflecting the relative value of uncertainty for all the selected firms. For corporate governance, variables like board size (BSIZE), board diversity (BDIVERSITY), non-executive directors (NED), duality of CEO (CEODUALITY), and outside directors (OUTSIDE_DIRECCTORS). Board diversity reflects the factor that how much female members are added in the board by the business for better strategic decision through gender variety. Maximum four female members are found in the board size with the deviation from the mean is .839. Non-executive directors or NED reflects number of outside directors in the board.

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<th>Table 1. Descriptive Statistics</th>
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<td>Variable</td>
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<td>LTLOAN</td>
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<td>TOTALLEV</td>
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<tr>
<td>FINANCIALLEV</td>
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<tr>
<td>OPERATINGLEV</td>
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<tr>
<td>FAGE</td>
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<tr>
<td>INTEREST_P-O</td>
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</table>
Correlation between firm age (FAGE) and INTEREST_P_RATIO is .151, significant at 5 percent. Significant and weak association is experienced between DPR and FAGE, between BSIZE and FAGE, between BDIVERSITY and FAGE. While negative and weak association is significant at 1 percent between BDIVERSITY and BSIZE under full sample. For OUTSIDE_DIRECTORS and BSIZE correlation is .149, significant at 5 percent level of significance. Overall problem of high correlation is analyzed through VIF as presented under table 3. For all the explanatory variables, VIF is between the range of 1-2 and maximum VIF is 1.137. While average VIF is observed at 1.067. Meanwhile, tolerance value for each of the variable is below .10, indicating no problem for high correlation, hence all factors can be considered for the further analysis.

**Table 2. Variables**

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<th>VARIABLES</th>
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<td>1.000</td>
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<td>0.093*</td>
<td>0.864</td>
<td>0.812</td>
<td>0.890</td>
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<tr>
<td>(6) BSIZE</td>
<td>-0.171**</td>
<td>-0.067</td>
<td>0.019</td>
<td>0.006</td>
<td>-0.076</td>
<td>1.000</td>
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<tr>
<td></td>
<td>0.013</td>
<td>0.337</td>
<td>0.785</td>
<td>0.932</td>
<td>0.271</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>(7) BDIVERSITY</td>
<td>0.135*</td>
<td>0.037</td>
<td>0.008</td>
<td>-0.122</td>
<td>-0.033</td>
<td>-0.276***</td>
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<tr>
<td></td>
<td>0.051</td>
<td>0.590</td>
<td>0.912</td>
<td>0.077</td>
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<td>0.000</td>
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<tr>
<td>(8) NED</td>
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<td>0.004</td>
<td>-0.020</td>
<td>-0.021</td>
<td>-0.098</td>
<td>0.029</td>
<td>0.050</td>
<td>1.000</td>
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<td></td>
<td>0.753</td>
<td>0.954</td>
<td>0.773</td>
<td>0.757</td>
<td>0.158</td>
<td>0.675</td>
<td>0.471</td>
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<tr>
<td>(9) CEODUALITY</td>
<td>0.018</td>
<td>0.061</td>
<td>-0.116</td>
<td>0.047</td>
<td>0.091</td>
<td>-0.000</td>
<td>-0.021</td>
<td>-0.087</td>
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<tr>
<td></td>
<td>0.795</td>
<td>0.379</td>
<td>0.092</td>
<td>0.496</td>
<td>0.189</td>
<td>0.998</td>
<td>0.757</td>
<td>0.211</td>
<td></td>
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</tr>
<tr>
<td>(10) OUTSIDE_ DIRECTORS</td>
<td>-0.025</td>
<td>-0.096</td>
<td>0.079</td>
<td>0.015</td>
<td>-0.075</td>
<td>0.149**</td>
<td>-0.039</td>
<td>0.099</td>
<td>-0.084</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>0.717</td>
<td>0.164</td>
<td>0.254</td>
<td>0.830</td>
<td>0.279</td>
<td>0.031</td>
<td>0.578</td>
<td>0.152</td>
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**Table 3. Variance Inflation Factor**

<table>
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<tr>
<th>VARIABLES</th>
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<th>1/VIF</th>
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<tr>
<td>BSIZE</td>
<td>1.137</td>
<td>.88</td>
</tr>
<tr>
<td>FAGE</td>
<td>1.122</td>
<td>.891</td>
</tr>
<tr>
<td>BDIVERSITY</td>
<td>1.118</td>
<td>.894</td>
</tr>
<tr>
<td>DPR</td>
<td>1.067</td>
<td>.937</td>
</tr>
<tr>
<td>OUTSIDE DIRECTORS</td>
<td>1.054</td>
<td>.949</td>
</tr>
</tbody>
</table>
Table 3 explains the effect of corporate governance indicators on capital structure indicators, along with women empowerment through board diversity. For capital structure, factors like DEBT_RATIO, LOG_LTLOAN, TOTALLEV, FINANCIALLEV, and OPERATINGLEV as observed as main dependent variables of the study. Model 1 for DEBT_RATIO indicates a significant effect of BSIZE with the coefficient of -.182. It means that more increasing board size is negatively and significantly affecting the debt portion of the firm over time. It reflects the adverse association between the governance factor through number of members in the board and loan proportion in total assets. For LOG_LTLOAN BSIZE is again negatively and significantly associated with the coefficient of -.127 and standard error of .0528. For the factor of total leverage, BISZE reflects a positive association through robust coefficient of .0557 and standard error of .0333. It means that better board size is leading to more value of total leverage, hence increasing the risk return and their magnification too. For financial and operating leverage, coefficients are .0557 and .0942 respectively. These values are also predicting the fact that increasing financial and operating leverage is observed through BSIZE. For women empowerment in the board members, board diversity is observed through addition of female members. It is found that all the proxies of capital structure except operating leverage are significantly and positively associated to BDIVERSITY. It means that board diversity through female members increasing the leverage capacity and capital structure format at the same time. For Non-executive directors NED, significant and negative influence is observed for the FINANCIALLEV with the coefficient of -.0216 and standard error of .0137. It reflects more NED in the board can lowers the value of financial leverage and vice versa. While the factor of CEO duality indicates no significant association between any of the capital structure and leverage factors. For outside directors, it is observed that negative and significant impact on TOTALLEV through coefficient of -.141 and standard error of .0566 as well. as per stated findings, Model 3 for TOTALLEV indicates highest robust & explained variation of .359. Table 5 shows the effect of firm age, interest payment ratio, dividend payout ratio, fixed payment covered ratio, risk and corporate governance indicators on all the proxies of capital structure and leverage. It is found that firm age has a significant and positive impact on DEBT_RATIO, and LOG_LTLOAN with the coefficients of .0422 and .00553 respectively. While its effect on TOTALLEV is -.00362, indicating significant negative influence under full sample of 35 business firms. However, for financial and operating leverage, age has no significant association. The factor of interest_P_RATIO has a positive impact on LOG_LTLOAN through beta coefficient of .00977. For TOTALLEV, coefficient is .00203 reflects that more value of total leverage is significantly depending upon INTEREST_P_RATIO. For dividend payout ratio DPR, negative influence on total loan and positive influence on total leverage is found. These findings explains that value of loan lowers with the increasing ratio of dividend payments in the business. However, for fixed payment covered ratio, none of the capital structure and leverage factor is significantly associated.

For the factor of risk, significant and negative association is found for LOG_LTLOAN with the coefficient of -.00527. With the presence of firm age, interest covered, dividend payments, fixed payments and risk factors, BDIVERISTY has a significantly negative influence on LOG_LTLOAN, and positively significance relationship with TOTALLEV. For financial & operating leverage, board diversity has a significant with the coefficient of .0558 and .0981 respectively.
Table 4. Effect of corporate governance on capital structure indicators

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DEBT_RATIO</td>
<td>LOG_LTLOAN</td>
<td>TOTALLEV</td>
<td>FINANCIALLEV</td>
<td>OPERATINGLEV</td>
</tr>
<tr>
<td><strong>BSIZE</strong></td>
<td>-0.182**</td>
<td>-0.127**</td>
<td>0.215***</td>
<td>0.0557*</td>
<td>0.0942*</td>
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<tr>
<td></td>
<td>(0.0836)</td>
<td>(0.0528)</td>
<td>(0.0229)</td>
<td>(0.0333)</td>
<td>(0.0495)</td>
</tr>
<tr>
<td><strong>BDIVERSITY</strong></td>
<td>0.296***</td>
<td>0.149***</td>
<td>0.140***</td>
<td>0.0389**</td>
<td>0.126</td>
</tr>
<tr>
<td></td>
<td>(0.017)</td>
<td>(0.010)</td>
<td>(0.0512)</td>
<td>(0.0058)</td>
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<tr>
<td><strong>NED</strong></td>
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<td>-0.0261*</td>
<td>-0.0301</td>
</tr>
<tr>
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<td>(0.128)</td>
<td>(0.0762)</td>
<td>(0.0330)</td>
<td>(0.0137)</td>
<td>(0.0874)</td>
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<tr>
<td><strong>CEODUALITY</strong></td>
<td>0.0988</td>
<td>0.0164</td>
<td>-0.0199</td>
<td>-0.164</td>
<td>-0.195</td>
</tr>
<tr>
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<td>(0.351)</td>
<td>(0.205)</td>
<td>(0.0904)</td>
<td>(0.129)</td>
<td>(0.198)</td>
</tr>
<tr>
<td><strong>OUTSIDE_DIRECTORS</strong></td>
<td>0.0135</td>
<td>0.0308</td>
<td>-0.141**</td>
<td>-0.00458</td>
<td>-0.103</td>
</tr>
<tr>
<td></td>
<td>(0.222)</td>
<td>(0.117)</td>
<td>(0.0566)</td>
<td>(0.0241)</td>
<td>(0.123)</td>
</tr>
<tr>
<td><strong>Constant</strong></td>
<td>6.386***</td>
<td>15.18***</td>
<td>2.698***</td>
<td>-0.310</td>
<td>0.0471</td>
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<tr>
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<td>(0.982)</td>
<td>(0.555)</td>
<td>(0.255)</td>
<td>(0.280)</td>
<td>(0.395)</td>
</tr>
<tr>
<td><strong>Observations</strong></td>
<td>210</td>
<td>184</td>
<td>210</td>
<td>210</td>
<td>210</td>
</tr>
<tr>
<td><strong>R-squared</strong></td>
<td>0.039</td>
<td>0.037</td>
<td>0.359</td>
<td>0.025</td>
<td>0.023</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5. Effect of corporate governance on capital structure indicators

<table>
<thead>
<tr>
<th>VARIABLES</th>
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<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
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<tbody>
<tr>
<td></td>
<td>DEBT_RATIO</td>
<td>LOG_LTLOAN</td>
<td>TOTALLEV</td>
<td>FINANCIALLEV</td>
<td>OPERATINGLEV</td>
</tr>
<tr>
<td><strong>FAGE</strong></td>
<td>0.0422***</td>
<td>0.00553***</td>
<td>-0.00362***</td>
<td>-0.000101</td>
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<td></td>
<td>(7.38e-05)</td>
<td>(0.00174)</td>
<td>(0.000776)</td>
<td>(0.000505)</td>
<td>(0.000800)</td>
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<tr>
<td><strong>INTEREST_P_RATIO</strong></td>
<td>-5.75e-05</td>
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<td>0.00203**</td>
<td>-0.000347</td>
<td>-0.00125</td>
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<tr>
<td></td>
<td>(3.77e-05)</td>
<td>(0.00183)</td>
<td>(0.000907)</td>
<td>(0.000639)</td>
<td>(0.00148)</td>
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<td><strong>DPR</strong></td>
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<td>0.0655**</td>
<td>0.0131</td>
<td>0.119</td>
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<tr>
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<td>(0.000737)</td>
<td>(0.0517)</td>
<td>(0.0253)</td>
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<td><strong>FPCR</strong></td>
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<tr>
<td><strong>RISK</strong></td>
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<td>-0.000968</td>
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<td>(6.59e-05)</td>
<td>(0.00167)</td>
<td>(0.000937)</td>
<td>(0.000478)</td>
<td>(0.000680)</td>
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<tr>
<td><strong>BDIVERSITY</strong></td>
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<td>-0.103*</td>
<td>0.200***</td>
<td>0.055*</td>
<td>0.0981*</td>
</tr>
<tr>
<td></td>
<td>(0.000513)</td>
<td>(0.0533)</td>
<td>(0.0224)</td>
<td>(0.0336)</td>
<td>(0.0501)</td>
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<tr>
<td><strong>BSIZE</strong></td>
<td>0.00233</td>
<td>-0.184</td>
<td>-0.117*</td>
<td>0.9053</td>
<td>0.150</td>
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<tr>
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<td>(0.00151)</td>
<td>(0.118)</td>
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<td>(0.0642)</td>
<td>(0.0939)</td>
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<tr>
<td><strong>NED</strong></td>
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<td>(0.0881)</td>
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<td><strong>OUTSIDE_DIRECTORS</strong></td>
<td>0.00115</td>
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<td>-0.00681</td>
<td>-0.120</td>
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<td>(0.00387)</td>
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<td><strong>CONSTANT</strong></td>
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<td>210</td>
<td>184</td>
<td>210</td>
<td>210</td>
<td>210</td>
</tr>
<tr>
<td><strong>R-squared</strong></td>
<td>0.2800</td>
<td>0.176</td>
<td>0.430</td>
<td>0.271</td>
<td>0.0451</td>
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Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
However, factor of board size has its significant and negative impact on total leverage. For NED, and CEO-DU-ALITY no significant association is found for capital structure and leverage dimensions. In addition, outside directors has a significant and negative influence on total leverage with the coefficient of -.141. Overall explanatory power is maximum for Model 8, followed by model 6 and Model 7 respectively (Table 4). In Table 5 effect of corporate governance on capital structure indicators is presented.

6. Conclusion and Recommendations

This study has analyzed the effect of corporate governance variables along with women empowerment on capital structure and leverage factors. For this purpose, a sample of 35 business firms working in the region of Thailand are selected over 2012 to 2016. Besides, effect of firm age, fixed payment ratios like interest and dividend with risk in the business is evaluated over similar time while adding the corporate governance indicators for capital structure and leverage. Pooled regression findings indicates that women empowerment in the board through board diversity indicates its significant and positive influence on debt rations, total leverage and financial leverage. But the effect on operating leverage is found to be insignificant under full sample of the study. while board size is negatively affecting the debt ratio and total debt in the business, but positive influence on total leverage, financial leverage and operating leverage. The value of financial leverage is negatively influenced by non-executive directors in the business. Through CEO duality, only effect on total leverage is significant & negative. With the presence of firm age, risk and fixed payment ratios, significant effect is observed through female members in the board on capital structure and leverage, except for debt ratio. It is observed that more outside directors in the board negatively and significantly affecting the total leverage, hence lowering the magnification of risk and return.

These findings have provided a solid justification for theoretical and empirical contribution in the literature from the context of Thailand. More precisely, empirical literature on women empowerment and capital structure is very limited and enough gap is still available to cover. It is found that capital structure and risk-taking decision of the business are closely link to the situation when there will be female members in the BODs. The influence of female members is not negligible due to gender diversity. Meanwhile, presented findings have their considerable implication in the field of financing decision and developing a corporate culture through mixture of board members. Business regulators and corporate strategic decision makers can review the impact of female members on leverage decision and mixture of debt and equity in the business. However, this study is based on several research limitations, providing a pathway for future research. At first sample size is limited to 35 firms only within specific region of Thailand with restricted implications outside the country. At second, advance panel models like GMM, fixed effect and random effect are also missing in the analysis part which can be reconsidered for upcoming studies.

References

Arora, A., & Sharma, C. (2016). Corporate governance and firm performance in developing countries: evidence from India. Corporate Governance, 16(2), 420-436. Available at: https://doi.org/10.1108/cg-01-2016-0018


Wen, Y., Rwegasira, K., & Bilderbeek, J. (2002). Corporate governance and capital structure decisions of the Chinese listed firms. Corporate Governance: An International Review, 10(2), 75-83. Available at: https://doi.org/10.1111/1467-8683.00271


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KNOWLEDGE SHARING AND TRANSFORMATIONAL LEADERSHIP

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Abstract. The principal objective of the current study is to explore the link between knowledge sharing transformational leadership style, team performance, and mutual trust. In addition to that moderating role of mutual trust is also examined. The study has broached the argument that knowledge sharing and transformational leadership style improves team performance. Findings of the current study suggest creativity is a process that starts in the team through the sharing of knowledge. The current study is also of the view that the process of creativity starts in the situation when the team members share knowledge through coordination and it is also argued that the much of the knowledge is shared when team members meet to share knowledge in a given area, much of which is tacit. Sharing such tacit knowledge creates a flow of novel ideas that contribute to successful outcomes, such as new products, processes and patents. The findings of the study have shown agreement with the proposed or hypothesize results. The study has used PLS-SEM to analyses the data. The study will be helpful for policy makers in the researcher in understanding the issues related to supply chain, its integration, flexibility, and internal performance.

Keywords: knowledge sharing, transformational, leadership


JEL Classifications: D8

1. Background

In the current era of globalization, there exists immense competition due to local and international competitors. For this reason, organizations are forced to adopt activities that are performance oriented and plays a central role in organizational development. A number of support mechanisms are adopted by organizations to improve the human resource available to them. These mechanisms were developed at organizational and employee level in which teams and employees of the organization were given learning opportunities, leadership support and empowerment as well (Yoon, Song, Lim, & Joo, 2010; Mughal et al., 2019).

There is an increase in the demand for highly skilled labors among the organizations due to increased globalization and competition. There is an increase in problem solving at the level of the team since the last few years. Organizations are trying to find different methods by which they can encourage the employees to work in a team and cooperate with other team members. For the performance, every employee is the basic asset for an organization. To improve organizational performance, team-based activities should be given importance by the organization. The team plays a critical role in bridging the relationship between organizational performance and individual performance (Edmondson, 2002; Setiyawati et al, 2018; Stübing et al, 2017; Tyagi & Siddiqui, 2017; Giedraitis et al., 2017; Černevičiūtė, Strazdas, 2018; Slávik et al., 2019).
So, the performance of the team is an important indicator of the success of the organization in considering factors related to the organizational environment and individual environment. The core of a team lies with its members who play a critical role in organizational performance as these players collaborate with each other and are also competitors as well. There exist different criteria related to the team formation and working, so effectivity of the team may vary in different organization. Therefore, general criteria’s and construct related to the team development and performance are discussed by a number of researchers (Sheikh, Soomro, Magsi, & Siddiqi).

Teams can be formed based on a large or small number of people. The number of people within the group depends upon the task to be achieved. When a group is formed, there is a mutual performance objective of the group, who all are committed to achieve a set goal and work together worth mutual responsibility. Therefore, the size of the team should be manageable, and there should be a commitment among all the employees of the group to achieve the mutual objective of the team. On the other hand, all of the team members should be equally accountable for their actions. It is because the overall performance of the team will be impacted by their individual acts (Tabassi, Ramli, Roufechaei, & Tabasi, 2014).

This is the era of knowledge intensive services provided by professionals. The resource provided by the knowledge provides a competitive advantage to the firm. The mechanism of knowledge sharing within the firm plays a significant role in the performance of the team because of one-to-one interaction among team players. Knowledge provides intellectual direction to the individuals regarding knowing how and knowing what. The factor of knowledge sharing has played a critical role in attracting a lot of interest because the organization as recognized knowledge as an important source to improve the performance of teams. Working in the teams is the core issue being faced by the organization now a days. Moreover, teams are the core structure of the organizations. So it is very important that team players share their experiences and information (Endres & Rhoad, 2016).

Organizations have to put a lot of effort to develop and form the team within the organization that is high functioning. They have to go through a lot of pains and struggles to form such a team. There are different stages of team formation which need proper guidance to the leaders to form a team. The stages of formation of team development are faced by all organization. The difference occurs is in the time of transition of team stages, which vary in different organizations and teams within the same organization as well. Leadership is the major factor of the success or failure of the team. The collective success of the team is achieved by the contribution of every team member. So, there can be a number of reasons for the failure of tea, including the inability of team members to perform, coordination resulting in collective failure and synchronization among team members (Zaccaro, Rittman, & Marks, 2001; Unaam et al, 2018; Widhiastuti et al, 2018; Wonyra, 2018). This shows that a lack of proper guidance and leadership can be a major cause of team failure.

When the teams are being formed, there exists a link among the team members in terms of motivation, proficiencies and personalities. It is expected that the team will perform several complex goals in a short period of time. It is expected that there will be proper leadership within the team who will communicate and define the established goals. Moreover, the leader will also outline the goals to be achieved by the team. There are a number of styles of leadership adopted by organizations to achieve a common goal. Transformational leadership is one of the most common and discussed styles of leadership. The transformational leaders are the role model of all the followers and team members who share knowledge and creative ideas so the team can work efficiently and cooperatively (Choi, Kim, Ullah, & Kang, 2016; Dappa et al., 2019).

The purpose of this paper is to have an empirical examination to evaluate the impact of Knowledge Sharing and Transformational Leadership on team performance in order to determine that if these most vital human resource variables have significant influence for development and performance of teams. Also, the study has investigated that mutual trust among the team members moderates the relationships of knowledge sharing and team performance; as well as the association of transformational leadership and team performance.
2. Literature Review

Team Performance

The scholars have found that association among the performance of the team and the factors influencing team performance are multifaceted. Therefore, they need a rigorous evidence-based investigation to strengthen team performance. The most important factor discussed in past literature regarding team performance is the information sharing among the team members. Researchers pointed out that the base of the group is in the members of the group and the way they interact with each other. This is basically social interaction among two or more people (Shin, Kim, Choi, & Lee, 2016).

Team performance is defined the extent to which the predictable goals are achieved by the team and completion of task in terms of quality. There are a number of factors revealed in the past studies regarding the team performance including (1) unity among the members of team to achieve a goal (2) the goal of the team to be homogeneous (3) information sharing and mechanism of communication (2) cohesiveness of the team and (2) commitment and role identity. Therefore, there is always a chance to improve performance. Generally, the performance of the team is based on the effectiveness of the team work which supports the notion that information sharing among the member of the team increase the productivity and performance through interaction (Mesmer-Magnus & DeChurch, 2009).

Emotional intelligence of the team members is another factor that influences the team performance, and also it is discussed on a number of occasions by the researchers on the past. Its been reported by a number of researchers that employee who has pleasant and consistent emotional intelligence will be very crucial for the performance and cohesion of team (Rapisarda, 2002; Yazici, 2018; Zhang et al, 2017; Obiunu & Rachael, 2018).

There are several characteristics of effective team performance. First of all, the actions of the team members should be integrated to achieve a goal. Secondly, members of the team are required to perform in dynamic and complex environments. The third characteristic is the leadership of the team. These leaders are the critical members of the team who define the goals and objectives of the team. They also assign tasks to the team members to achieve these goals (Zaccaro & Klimoski, 2002).

Knowledge Sharing

There is a major difference between knowledge sharing and other terms, like knowledge exchange and knowledge transfer. There is an acquisition of knowledge source with sharing of knowledge source in the knowledge transfer. Whereas, knowledge sharing is related to communication but its not the communication. in the strict sense, it is not possible to share the information, like the good, information or knowledge cannot be shared freely. Sharing of knowledge is a cognitive subject. Rebuilding the behavior of employees is indispensable to get knowledge from others. The knowledge used by it is to be acquired, thus sharing the knowledge. The relation among at least two parties is the sharing knowledge because one of the two parties have the knowledge and other side acquire the knowledge (Zheng, 2017).

Researchers have defined knowledge sharing as the exchange of knowledge or behavior of the employee, which helps the other through knowledge (Ipe, 2003). Researchers observed that sharing of knowledge between individuals is the process that individual with private knowledge understand, absorb and use by other, knowledge sharing at the individual level has the significant positive outcome on the performance of the organization including improved capability of the organization, creativity in the work environment, cohesion in the performance of team, integration of knowledge and decision satisfaction. This shows that knowledge sharing is the behavior of the individual in which source of the knowledge does not want to give the ownership of knowledge (Güver & Motchnig, 2017).
Additionally, researchers asserted that sharing of knowledge is a social system that supports integration and collaboration that is supported by technology in normal circumstances. Researchers also supported the point of view that technology should be part of knowledge sharing by individuals. Exchanging and creating knowledge are the activities that are integrated, which cannot be imposed or supervised. Knowledge sharing can only happen when employees of the organization’s voluntary collaborate with each other. New knowledge is created due to the exchange of knowledge. this creation of knowledge is important to develop a competitive advantage (Tasmin & Woods, 2007).

Researchers also stated that often, knowledge sharing is unnatural. People, most of the times, think that knowledge is important and valuable, so they do not share the knowledge. Most of the researchers agree that knowledge sharing is at the individual level of the organization. Even in those organizations where there are no norms regarding knowledge sharing, people tend to share information on the basis of their individual benefits. In the end, activities related to knowledge sharing are important for maximization of revenue and profitability of the organization (Bock & Kim, 2002). Research study conducted by (Mittal & Dhar, 2015) have examined the moderating impact of knowledge sharing on the relationship between transformational leadership and creativity of employees. It is observed that knowledge management significantly moderates the relationship between the both. Masa’deh, Obeidat, and Tarhini (2016) have examined the factor of knowledge sharing and its adoption in business organization. Findings through empirical analysis indicates that both the factors of transformational leadership and transactional leadership have their significant relationship with the job performance of the employees.

**Transformational Leadership**

Leaders and leadership fascinate all. Individuals, corporation and nations all are inspired by the leaders. Since a number of years, academicians, researchers and scholars tried to understand and define the process of leadership. First time Stogdill (1974) pointed out that, there exists as many definitions of leadership as the number of scholars who have tried to define this concept. Among these definitions and explanations, the concept of transformational leadership attracted scholars. Most of the studies conducted in the last 20 years regarding leadership are based on transformational leadership (Judge & Bono, 2000; Nxumalo & Naidoo, 2018).

The descriptive research was involved through which the transformational leadership concept was formulated. Researchers defined and explained transformational leadership as the process in which followers and leaders raise each other to a higher level of motivation and morality. The political leaders try to increase the follower’s consciousness by ideal appealing and moral values like humanitarianism, peace, equality, justice and liberty not based on emotions like hatred, jealousy, greed and fear. There occurs elevation in the followers to their better selves from everyday selves (Yaghoubi, Mahallati, Moghadam, & Fallah, 2014). Some other studies have also focused on the similar idea (Dong, Bartol, Zhang, & Li, 2017; Han, Seo, Yoon, & Yoon, 2016).

Researchers have defined transformational leadership in terms of its impact on followers: they feel respect, loyalty, admiration and trust towards their leader. Moreover, followers are tending to act beyond the expectations from the. Researchers mentioned that leaders motivate and transform followers by (1) activation of their higher level of needs (2) induce their own self interest for the betterment of team and organization (3) making followers more aware of the importance of their individual goals. In transformational leadership, the followers are motivated by the leaders to improve their performance (Krishnan, 2007).

Components of transformational leadership are identified by the factor studies as laissez faire, management by exception, contingent reward, individualized consideration, intellectual stimulation, inspirational motivation and idealized influence (Erkutlu, 2008). Researchers further categorized these factors into sub scales (a) individualized consideration, intellectual stimulation, inspirational motivation, idealized influence as transformational leaders (Avolio & Bass, 1995) (b) management by exceptions and contingent reward as transactional leadership components and (c) Laissez-Faire is considered as component of non-leadership (Krishnan, 2007).
Researchers confirmed that the leadership potential of transformational leaders is more than those who are categorized as transactional leaders by the subordinates of the leaders. The performance appraisal of subordinates of transformational leaders is much better than those of other categories of leadership. The teams who are led by the transformational leaders have much better outcomes as well (Geyery & Steyrer, 1998).

**Knowledge Sharing and Team Performance**

The performance of the team is improved within the team as a result of knowledge sharing. It is because of three reasons: enhanced creativity, better problem solving and improvement in the decision-making process. The team members can consider more options due to knowledge sharing. Followers can learn from the experience of other employees and team members. By this way, knowledge is used within the team in a better way, which leads to an improvement in the decision-making process (Mahmood, Hussan, Sarfraz, Abdullah, & Basheer, 2016; Hussain, Sallehuddin, Shamsudin, & Jabarullah, 2018). The problem faced by the organization can easily be solved by the knowledge sharing because the problem can be better understood, more alternatives to solve the problem can be explored, and the issues causing the problem can be found out earlier. A number of studies have supported the argument that team performance is improved by knowledge sharing (Jamshed & Majeed, 2018).

It's been evident from the past empirical studies that knowledge sharing has several benefits for the employees and employers. Past studies have proven empirically that employee's performance at the individual level is significantly impacted by knowledge sharing (Mahmood et al., 2016; Pangil & Moi Chan, 2014). Sharing of knowledge within the team occurs when employees or team members assist other team members in terms of judgements, expertise, facts and ideas so new skills can be developed. So, the factor of knowledge sharing is key for the members of the team to improve their performance. Knowledge sharing within the team shows team members sharing information, opinion and expertise reading specific problem or task (Cummings, 2004; Le & Lei, 2018; Yang & Farn, 2009).

**Transformational Leadership and Team Performance**

Leadership at the level of the team is very important for the firm to be successful because more and more firms are adopting the culture of team-based work. Transformational leaders are confident and optimistic about the future. Moreover, they express the goals and objectives to the followers. By this way, followers are encouraged as they view the vision of the organization to be meaningful. Employees also consider their work as an important contributor to achieve organizational goals (Elrehail, Emeagwali, Alsaad, & Alzghoul, 2018; Le & Lei, 2018; Piccolo & Colquitt, 2006).

Transformational leaders encourage intellectual stimulation, recognize the work which is a good one, communicate high expectation and provide development opportunities, thus take a keen interest in the followers (Mahmood et al., 2016). The role of the leaders is very active in providing guidance and direction, supporting and coordinating the activities to organizations or team members due to which they are able to synergize their work to achieve the organizational goals (Mahmood et al., 2016; Wang & Howell, 2010).

Transformational leadership has a significant impact on the performance of the team. On the other hand, there are a number of studies that have found a positive relationship between team performance and leadership initiatives. A system is developed, initiated and maintained by the transformational leaders who value performance and rewards through policies related to people and develop the relationship of high quality with the followers so the team performance can be enhanced (Wu, Tsui, & Kinicki, 2010).

**Mutual Trust**

As there exists no definition of trust which is universally accepted, the term trust is referred to as the willingness of one party which rely on the interpersonal relationship of another. Which is, mutual trust is defined as a psycho-logical state consist of the intention of accepting the vulnerability on the basis of positive expectations of behavior or intentions of another (Kim, Wang, & Chen, 2018).
Researchers have identified two elements of trust: cognitive and effective. Emotional bonds and interpersonal care are the bases of affective trust between trustee and trustor. On the other hand, belief regarding integrity, reliability and ability about the trustee is reflected in cognitive trust. Employee performance is significantly impacted by the cognitive and effective trust (Burke, Sims, Lazzara, & Salas, 2007).

Trust is a very complex relationship among persons. But at the level of teams, this relationship is even more complex. Loyalty, commitment and communication among the team members is increased due to trust. Trust is basically the foundation among the team member, which enables them to work together. The team performance is improved by the trust among the team members, which would lead to an increase in revenue and profitability of the organizations. Trust is considered as factor that plays crucial among the team members for networks, startups and teams that are being created. In the current era of modernization, trust among the team members is considered key because, in the presence of rigid rules, policies of the organization cannot be formed (Hakanen & Soudunsaari, 2012).

One of the basic units of any organization is its team; it keeps together the insight, experience and skills of a number of people. Most of the time, the team which is performing very good do not consist of brightest people. Basically, such teams consist of people who possess diverse knowledge and skills required to be successful. If the team is built on trust, it will be built on the high level of trust among the employees (Fapohunda, 2013)

**Association of Mutual trust with Knowledge Sharing and Leadership**

In the past, the relationship between mutual trust and transformational leadership within a team setting has been widely discussed in studies (Chou, Lin, Chang, & Chuang, 2013; Ryan, 2012). As well the association of mutual trust and knowledge sharing has also been discussed in the literature (Casimir, Lee, & Loon, 2012; Cheng, Hailin, & Hongming, 2008; Jain, Sandhu, & Goh, 2015; Sankowska, 2013).

In the current study, trust is considered faith in the goodwill and behavior of other’s that can be vanished or grow due to experience or interaction. Lack of trust among the team members may impact the productivity, empowerment, delegation and communication. Trust is very sensitive, that can be lost quickly because of negative experiences. Researchers have reported four elements of trust building, namely, respect, consistency, openness and honesty. Without any one of these dimensions, trust can even break or fray (Hakanen & Soudunsaari, 2012).

**Research Framework**

Based on the previous literature, the following framework of research has been developed (Figure 1):

![Research Framework Diagram](image-url)
The research framework presents the following hypotheses:

H1: Knowledge sharing has a significant direct impact on team performance.

H2: Transformational leadership has a significant direct impact on team performance.

H3: Mutual trust has a significant direct impact on team performance.

H4: Mutual trust moderates the relationship between knowledge sharing and team performance.

H5: Mutual trust moderates the relationship between transformational leadership and team performance.

3. Methodology

In order to address the objectives and research questions of the current study, a survey method is used. A primary research technique is employed taking the questionnaire as a tool for data collection. The structural equation modeling for analyzing the structural relation is selected. SEM is a combination of multiple regression and factor analysis and observes the structural relation between the latent and measured constructs as well as the direct and indirect connection between the constructs. Selection of sample size is an important aspect of Structural Equation Modelling. In the process of choosing the appropriate sample size, a sample of 310 is selected for this research. However, in order to avoid response-bias, the sample size has increased to 600. The overall response rate came out to be 62.5 percent having 435 well addressed questionnaires. Therefore, keeping in view the research capabilities and objectives, SEM-PLS is employed for analyzing the structural equation modelling.

In addition, the Statistical Package of Social Sciences (SPSS) is also employed for assembling of data and for advanced statistical analysis. Initially, the responses obtained through questionnaires are coded into the software, and statistical analysis is performed through PLS. SEM is an advanced multivariate analysis and has been broadly used in business research. It involves data analysis of multiple variables observing the direct and indirect causal relation with simultaneous estimation of separate, multiple, and interdependent regression equations. The SEM technique is preferable as compared to multiple regression because SEM simultaneously observes the nature of the association between the multiple variables, whereas multiple regression observes the relation between these variables separately and independently.

4. Results

Structural Equation Modeling operates for identifying the extent to which the determination of the structural model is in line with the sample data and how appropriately fits the data. It particularly observes the structure of relation among the existing observed variables (F. Hair Jr, Sarstedt, Hopkins, & G. Kuppelwieser, 2014; Hafeez, Basheer, Rafique, & Siddiqui, 2018). On the other hand, observed variables explain the latent variables as well as make inferences about them. Where latent variables are the unobserved variables that require more and more constructs for defining them (Basheer, Siam, Awn, & Hassan, 2019). Furthermore, a maximum likelihood approach is used for the advanced evaluation of the model. The analysis Measurement model, together with the confirmatory factor analysis, examine the estimates from the CFA (Basheer et al., 2019).
Confirmatory Factor Analysis is also used to assess whether the constructs of both proposed and measured model show consistent results (see Figure 2, Table 1).

Table 1. Outer Loadings

<table>
<thead>
<tr>
<th></th>
<th>KS</th>
<th>MT</th>
<th>TL</th>
<th>TP</th>
</tr>
</thead>
<tbody>
<tr>
<td>KS1</td>
<td>0.896</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KS2</td>
<td>0.912</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KS3</td>
<td>0.898</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KS4</td>
<td>0.894</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MT1</td>
<td></td>
<td>0.932</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MT2</td>
<td></td>
<td>0.916</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MT3</td>
<td></td>
<td>0.926</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MT4</td>
<td></td>
<td>0.877</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TL1</td>
<td></td>
<td></td>
<td>0.899</td>
<td></td>
</tr>
<tr>
<td>TL2</td>
<td></td>
<td></td>
<td>0.891</td>
<td></td>
</tr>
<tr>
<td>TL3</td>
<td></td>
<td></td>
<td>0.918</td>
<td></td>
</tr>
<tr>
<td>TL4</td>
<td></td>
<td></td>
<td>0.872</td>
<td></td>
</tr>
<tr>
<td>TP2</td>
<td></td>
<td></td>
<td></td>
<td>0.910</td>
</tr>
<tr>
<td>TP3</td>
<td></td>
<td></td>
<td></td>
<td>0.905</td>
</tr>
<tr>
<td>TP4</td>
<td></td>
<td></td>
<td></td>
<td>0.874</td>
</tr>
<tr>
<td>TP5</td>
<td></td>
<td></td>
<td></td>
<td>0.885</td>
</tr>
<tr>
<td>TP6</td>
<td></td>
<td></td>
<td></td>
<td>0.825</td>
</tr>
<tr>
<td>TP7</td>
<td></td>
<td></td>
<td></td>
<td>0.871</td>
</tr>
<tr>
<td>TP8</td>
<td></td>
<td></td>
<td></td>
<td>0.851</td>
</tr>
</tbody>
</table>
The coefficient value of 0.80, 0.70, and 0.60 are considered to be good, acceptable, and poor reliability. According to a rule of thumb, a value above 0.50 depicts adequate reliability, and less than 0.50 depicts inadequate reliability of the constructs (Basheer et al., 2019; Hafeez et al., 2018). However, 0.50-0.60 is a suitable and acceptable range for the measures of reliability. All the constructs for the present study turned out to be reliable (Table 2). Based on previous researches, 0.60 is taken as the threshold value for the Cronbach alpha estimate.

Table 2. Reliability Analysis

<table>
<thead>
<tr>
<th></th>
<th>Cronbach’s Alpha</th>
<th>rho_A</th>
<th>Composite Reliability</th>
<th>Average Variance Extracted (AVE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>KS</td>
<td>0.866</td>
<td>0.967</td>
<td>0.969</td>
<td>0.68</td>
</tr>
<tr>
<td>TS</td>
<td>0.93</td>
<td>0.95</td>
<td>0.96</td>
<td>0.799</td>
</tr>
<tr>
<td>MT</td>
<td>0.968</td>
<td>0.949</td>
<td>0.96</td>
<td>0.829</td>
</tr>
<tr>
<td>TP</td>
<td>0.867</td>
<td>0.968</td>
<td>0.97</td>
<td>0.667</td>
</tr>
</tbody>
</table>

The goodness of fit indices turned out as TLI= 0.938, PNFT= 0.933, RMSEA= 0.05, and CFI=0.94. The values of all estimates are within the acceptable levels, explaining the goodness of fit (Hafeez et al., 2018). However, the SEM-PLS is used for the estimation of the inner model, i.e. determining the composite reliability, discriminant validity, and factor loadings of the constructs.

Discriminant validity is also obtained for the current study by comparing the item and cross loadings (Table 3). Discriminant validity determines the extent of distinctiveness and visibility of the measures of constructs. Afterwards, the structural equation model is estimated using a path diagram, which is an effective technique of measuring the indirect and direct association between the observed constructs (Hafeez et al., 2018). Therefore, SEM is preferred for this research and for the hypotheses testing.

Table 3. Discriminant Validity

<table>
<thead>
<tr>
<th></th>
<th>KS</th>
<th>TS</th>
<th>MT</th>
<th>TP</th>
</tr>
</thead>
<tbody>
<tr>
<td>KS</td>
<td>0.825</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TS</td>
<td>0.827</td>
<td>0.894</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MT</td>
<td>0.815</td>
<td>0.892</td>
<td>0.911</td>
<td></td>
</tr>
<tr>
<td>TP</td>
<td>0.885</td>
<td>0.723</td>
<td>0.730</td>
<td>0.817</td>
</tr>
</tbody>
</table>

Furthermore, the hypothesized structural model is developed for assessing the relation between the latent constructs. However, path coefficients are also obtained to observe the association between the variables and to conclude the proposed hypotheses. After assessing the structural model, the fitness of the model is checked through the Goodness of Fit test. It determines if the proposed model is appropriate for hypothesis testing (Hameed, Basheer, Iqbal, Anwar, & Ahmad, 2018). Finally, the measurement model is then converted into the structural form for identifying the association between exogenous and endogenous constructs. The table 4 shows the findings of direct hypotheses, depicting the significant acceptance of all direct hypotheses.

Table 4. Direct Relations

<table>
<thead>
<tr>
<th></th>
<th>Original Sample (O)</th>
<th>Sample Mean (M)</th>
<th>Standard Deviation (STDEV)</th>
<th>T Statistics (O/STDEV)</th>
<th>P Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>0.414</td>
<td>0.416</td>
<td>0.048</td>
<td>3.672</td>
<td>0.001</td>
</tr>
<tr>
<td>H2</td>
<td>0.563</td>
<td>0.353</td>
<td>0.068</td>
<td>3.516</td>
<td>0.001</td>
</tr>
<tr>
<td>H3</td>
<td>0.652</td>
<td>0.654</td>
<td>0.059</td>
<td>4.912</td>
<td>0.000</td>
</tr>
</tbody>
</table>

The moderation of mutual Trust in the relationship between knowledge sharing, transformational leadership style, and team performance is shown in table 5.
Table 5. Indirect Relations

|     | Original Sample (O) | Sample Mean (M) | Standard Deviation (STDEV) | T Statistics (|O/STDEV|) | P Values |
|-----|---------------------|-----------------|----------------------------|----------------|----------|
| H4  | 0.524               | 0.635           | 0.078                      | 4.372          | 0.001    |
| H5  | 0.474               | 0.764           | 0.070                      | 3.239          | 0.000    |

Nonetheless, Table 6 shows R2. According to Chin (1998), R² value above 0.67 considered as substantial, more than 0.33 considered as moderate, however, value below 0.33 but above 0.19 describe weak determination.

Table 6. R2

<table>
<thead>
<tr>
<th>Latent Variable</th>
<th>Variance Explained (R²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP</td>
<td>48.4%</td>
</tr>
</tbody>
</table>

In the current study R² value is 0.484 which is substantial.

5. Conclusion

The principal objective of the current study is to explore the link between knowledge sharing transformational leadership style, team performance, and mutual trust. In addition to that moderating role of mutual trust is also examined. The study has broached the argument that knowledge sharing and transformational leadership style improves team performance. Findings of the current study suggest creativity is a process that starts in the team through the sharing of knowledge. The currents study is also of the view that the that the process of creativity starts in the situation when the team members share knowledge through coordination and it is also argued that the much of the knowledge is shared when team members meet to share knowledge in a given area, much of which is tacit. Sharing such tacit knowledge creates a flow of novel ideas that contribute to successful outcomes, such as new products, processes and patents. The findings of the study have shown agreement with the proposed or hypothesize results. The study has used PLS-SEM to analyses the data. The study will be helpful for policy makers in the researcher in understanding the issues related to supply chain, its integration, flexibility, and internal performance. The findings of the study revealed the fact that, though trust is complicated yet is a key to team level performance. It is argued that the trust considered as a foundation of working together as it helps in enhancing social interactions. Trust plays a crucial role when global business teams, startups, and networks are being created.

References


Edmondson, A. C. (2002). The local and variegated nature of learning in organizations: A group-level perspective. Organization science, 13(2), 128-146. Available at: https://doi.org/10.1287/orsc.13.2.128.530


Han, S. H., Seo, G., Yoon, S. W., & Yoon, D.-Y. (2016). Transformational leadership and knowledge sharing: Mediating roles of employee’s empowerment, commitment, and citizenship behaviors. Journal of Workplace Learning, 28(3), 130-149. Available at: https://doi.org/10.1080/jwl-09-2015-0066


Ryan, S. (2012). The relationship between shared vision, cohesion, role clarity, mutual trust and transformational leadership within a team setting. Stellenbosch: Stellenbosch University.


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INFLUENCE OF THE MARKET OF BUSINESS INTELLECTUAL SERVICES ON THE INNOVATION SAFETY OF EU COUNTRIES

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Abstract. This paper reveals the specifics of production, promotion and resource support of business intellectual services at the world market and market of EU countries. It was proved that an important aspect of the production of intellectual services is the process of joint production, where producer and consumer are trusted partners. The features of formation of demand in the market of business intellectual services, subjects of which are mostly innovation-active economy entities, were described, and the influence of this market on the innovation safety of countries was determined. The characteristics of a consumer of business intellectual services was performed taking into account features of national markets and safety of their functioning.

Keywords: innovation safety of countries; areas of services; business intellectual services; economic sectors of EU countries; consumers; export and import of commercial services


JEL Classifications: F19, F43, L86

1. Introduction

The role of the service sector in the global economic system as a whole, and the sectors of intellectual services, in particular, have a rapid growth dynamics. So, EU countries produce a significant share of value added in this sector, which makes up of 20% per year in average. The most common type of intelligent services is the so-called business services, namely: consulting, financial, legal, research, and information (Bonditti et al., 2017). However, the significance of the sector of intellectual services is determined not only and not so much by the quantitative leaps as by the qualitative ones that it brings to other sectors of the world economy, but by the provision of innovative safety of countries and their associations.

So, the relevance of the topic of scientific research, on the one hand, is due to the formation of an growing tendency of increase of the role of intellectual services in the global economy as a key factor of economic growth, high activity of companies in the generation, production and promotion of intellectual services, and, on the other hand, increase in the level of intellectual threats through the mass and ease of transferring intellectual capital across the borders of countries (Drobyazko S., 2017). In addition, there is a fragmentation of studies of features of the market for business intelligence services in the leading countries of the world (including in such an integration union as the EU), the lack of appropriate scientific and methodological approaches, taking into...
account the features of their national markets, and understanding the importance of the factor of innovation and intellectual security.

2. Literature Survey

The significant contribution to the development of the theory of intellectual services and aspects of national innovation development is made by papers of such researches as (Abrhám, Lžicar, 2018; Chaffey, Ellis-Chadwick, 2012; Hunt, 2000; Kirshner, 2013; Rogers, 2003; Standler, 2014; Thompson, et. al., 2015; Sagiyeva et al., 2018; Girdzijauskaite et al., 2019).

In the work of these authors, certain issues of the specifics of the sector of intellectual services, formation of a large-scale world-wide market of intellectual services, functioning of companies in the market of intellectual services, connection of the activity of the market of intellectual services with economic growth and innovative safety in the world economy have a tendency to conceptual comprehension (Drobyazko S., et al., 2019).

The purpose of the study is to analyze the leading trends in the creation and promotion of business intellectual services in the world market, based on the research of the market of business intellectual services in the EU countries, and determination of the level of influence of these markets on innovation safety.

3. Methods

The global trend of the evolution of a developed market economy is an increase in the share of services in total world production and GDP of countries. In the last third of the twentieth century, one of the main trends of economic development is evident - the advancing growth of the services sector in comparison with the sectors of material production and expansion of its economic positions. However, the role of the sector of services in the modern economy is not only related to its predominance in the structure of the world economy (Senan, 2018).

Today, key factors of economic growth are formed (scientific and technical knowledge, non-material forms of accumulation, information technologies, etc.) in the service sector.

The consumption process in the business intellectual sector is different from the standard service consumption process, which in turn significantly affects demand. According to the traditional theory of demand, the consumer is able to use any quantity of goods purchased (Dźwigoł et al., 2019).

In turn, the consumer’s ability to adapt intellectual services becomes a constraining factor for the sector of business intellectual services. According to the standard economic model, demand for goods is formed under the influence of the needs that arise in the consumer. There is other situation in the sector of business intellectual sector, the fact that the consumer has a need does not yet make him a full-fledged representative of demand, which embodies both desire and opportunity (Solomon et al., 2016). Ability to perceive strongly limits the possibility of full consumption. The demand in the market for business intellectual services is formed by three factors: “need”, “paying capacity” and “ability to perceive”.

Another feature of demand for business intellectual services is that demand is segmented according to consumer experience. Getting the experience of using intellectual services does not depend on how often the consumer uses the same service, but on the heterogeneity of the consumed services (Vo, et al., 2017).

4. Results

We will conduct an analytical study of the state of the world market of intellectual services. Deep scientific, technical, structural and other changes are of great importance in the service sector itself, they are those changes that increase their contribution to the development of the world economy, which create the necessary Preconditions for the development of scientific and technological progress. Fig. 1 shows the share of services in GDP, employment and export volumes by region (world, developed countries and developing countries).
According to expert estimates, about 70% of the total world output is due to all types of services, with the most dynamic growing sector being international trade in services. The degree of development of the service sector becomes a leading criterion of the development of world society. For large countries, the foreign trade turnover in services is hundreds of billions of dollars (Leese, & Wittendorp, 2017; Makedon, 2018).

The international trade in services is the most dynamic sector of international trade. An analysis of the dynamics and composition of world trade in services shows that among the three main groups - transport services, tourism, other commercial services - the group of other commercial services is distinguished by dynamical growth. Between 2006 and 2018, the share of exports of other commercial services increased from 45% to 54%, the share of tourist services decreased by 6% and amounted to 26%, the share of transport services decreased by 2% and amounted to 21%. The share of imports of other commercial services has increased from 41% to 48%, the share of tourist services has decreased from 30 to 24%, and the share of transport services has decreased from 29% to 28% (Table 1) (World trade statistical review, 2018).

The world trade in commercial services in 2018 amounted to 2,345 billion US dollars. Positions of types of services were distributed as follows: “Other commercial services” include financial services (13%), insurance services (4%), royalties and licensing payments (12%), computer and information services (11%), construction
(5%), telecommunication services (5%), personal, recreational, and cultural services (2%). The share of other types of business services is 48% of the total world trade in commercial services (Fig. 2).

![Fig. 2. Specific structure of world exports of other commercial services in 2018, %](image)

Source: Developed by the authors according to the source (Global Economic Prospects (2019))

The sector composition of business services is substantially complicated by the association of contentually alike services, which is dictated by the logic of business. The regional structure of world exports of other commercial services shows the largest share of the EU countries in all types of services, other than construction, royalties and license fees, with the leading Asian and North American countries, respectively. The share of regions in world exports of other commercial services is presented in Fig. 3.

![Fig. 3. Share of regions in world exports of other commercial services from industries in 2018, %](image)

Source: Developed by the authors according to the source (International Trade Statistics Yearbook)

The regional structure of world exports of other commercial services in value terms is presented in Fig. 4.
The main exporters of other business services are EU countries (more than 50%), USA (12.5%), China (6.2%), and Japan (4.8%). The main exporters of other business services are EU countries (more than 60%), USA (12.5%), China (10%), and Japan (6%). Also, developing countries: like India, Hong Kong and Singapore, show high performance in trade in business services.

The fastest growth demonstrates the trade in computer and information services, insurance services, telecommunications, and other business services (Fig. 5).
The average annual growth of exports of computer and information services amounted to 14%, insurance services - 11%, telecommunications services - 11%. The share of other commercial services in the global export of services is 54%, including some 60% or more in the developed countries (The Global Information Technology Report). More than 95% of revenues under this heading come from various types of business services, 5% are personal, recreational and cultural services.

In line with the methodology of the sixth edition of the IMF Guidelines on Balance of Payments and International Investment Position, the group of other business services is represented by intermediary services, services for operating leasing and other business, professional and technical services. Fig. 6. shows main exporters of other business services in 2018.

**Fig. 6.** Volume of exports of other business services in 2018, billion US dollars

*Source:* Developed by the authors according to the source (World trade statistical review, 2018)

Fig. 7. shows main exporters of other business services in 2018.

**Fig. 7.** Volume of import of other business services in 2018, mln. dollars

*Source:* Developed by the authors according to the source (World trade statistical review, 2018)
As we see from the figure, the main suppliers and consumers of other business services are the countries of Europe, EU and, in particular, the United States. Among the most dynamic articles of international trade one can distinguish business services, primarily information, consulting and other high-tech services.

The distribution of international supply of services from existing supply methods is a complex task, since production, distribution, marketing, sales, and delivery of services can often be carried out in many ways, as described above. Example: a specialist working in an audit firm goes abroad to establish business contacts with a potential client (the method of “presence of individuals” in the initial absence of an economic transaction), the client’s consultation process, in case of establishment of business relations, may also be carried out online in the future (the method of “cross-border provision”), and the situation may arise when the client comes to get advice itself (the method of “consuming abroad”) (Handbook of Statistics, 2018). The stable business contacts with a client abroad can lead to the establishment of representation abroad by a firm (the “business presence” method).

In international trade, EU countries are dominating in rendering other business services - more than 50% of world exports and imports of services. The business services show a qualitatively new level in their development, have significantly increased the level and quality of customer service and play an important role today in the effective development of the economy of Western countries. The interest is due not only to the quantitative characteristics, but also to the qualitative characteristics of this category of services, which is also relevant for the analysis of the development of these services in the EU.

In the countries of Western Europe, the share of employed in the service sector is more than 58.5-74% of the total number of employees. In the EU countries, the share of services in GDP and employment is 65-75% and 65%, respectively. The service sector has 50% of foreign direct investment in the world. The group of leading services in the EU countries is represented by a group of knowledge-intensive industries (telecommunication services, financial services, insurance services, business services of scientific content, education, health care, etc.). (Eurostat, 2018).

Scientific and technological progress, namely, information technology and computer technology, time and geographical boundaries, which are reduced or eliminated in the course of business activity, force the services to operate in a new way.

The export share of high-tech services in the EU countries is 50% of total exports. The leading export countries for science-intensive services are Denmark, Ireland, Great Britain, and Luxembourg (more than 60%). The rate of growth of the export share of high-tech services in the EU countries is on average 1.5%. This figure is 10% in countries such as Finland, Hungary, and Malta ((European Innovation Scoreboard, 2018).

New types of services are developing, including, as a result of their cheapening and expansion of an access by means of information technologies, which positively affects their quality, it becomes possible to process the service more individually, services become not only more diverse and more accessible, but also the convenience of consumption improves, and eventually utility per unit increases.

In most European Union countries, consulting services (marketing, advertising, leasing, engineering, construction and architectural services, accounting services, audit services, etc.) and non-technical types of business services (selection services staff, public relations, etc.) take the leading place in the growth rate of the European Union. Among the EU countries, the leaders in providing business services are: Great Britain, Germany, the Netherlands, Cyprus, France, and Luxembourg. Among the EU countries, the leaders in consumption business services are: Great Britain, Germany, Netherlands, Cyprus, France, Czech Republic, Austria, and Finland. Business services bring the greatest contribution to the category of intellectual services, in the EU countries this figure is 11% (Fig. 8).
The development of the sector of intellectual services indicates the level of development of the economy. In the course of analysis it was found that the well-being of a given country is also related to the sector of intellectual services. The average indicator of the share of intellectual services in gross value added by EU countries is 20%.

The dynamic growth of the volume of research and development is also characteristic of the services sector, while it extends not only to information and telecommunication services, but also to other types (Fig. 9).

**Fig. 8.** The share of intellectual services in the gross value added of the EU countries, in %

*Source:* Developed by the authors according to the source (European Innovation Scoreboard, 2018).

**Fig. 9.** The average annual growth rate of research and development costs in the service sector and manufacturing industry of the EU countries for the period 2010-2018, %

*Source:* Developed by the authors according to the source (European Innovation Scoreboard, 2018).
There is a significant growth of innovation activity in the services sector. So, the share of such firms in the field of business services has already reached 50% in Estonia and Germany in the period of 2010-2018 (Fig. 10).

![Fig. 10. The share of innovative active firms in the sector of business services and in processing industry in the EU countries for the period 2010-2018, %](image)

Source: Developed by the authors according to the source (European Innovation Scoreboard, 2018).

In general, services of an informational nature (financial services, business services) show a higher level of innovation than services based on the use of tangible objects (transport, wholesale and retail trade).

## 5. Discussion

The predominance of non-technology-related innovation services will be explained by the fact that they have more instrumental nature in the service sector. The share of service sector in total business expenses for innovation activity is almost 30% in all EU countries, but the expenses of service firms for innovation are usually less than industrial ones, even with the adjustment for the size of companies (service companies on average are smaller than industrial ones).

The efforts of many EU countries are aimed at active working on development of approaches to the development of services innovation.

The prerequisites for the creation of a pan-European strategy for innovation and intellectual safety are (Koenig, 2016):
- growth of high-tech (intellectual) services;
- growth of innovation activity in the service sector;
- the predominance of innovations not related to technologies.

EU countries are keen to have the services market as transparent as possible and the end user has access to information about innovation-active service providers.

The EU expert group indicated the following measures aimed at solving the following tasks:
– European innovation platform for high-tech services;
– European Institute of Innovation in the service sector;
– network of information exchange on innovative services;
– initiative to support risky innovative services projects.

The active policy in this direction is only beginning to develop. An important area of development is the improvement of statistics, as well as an effective system of indicators and data collection that will make the scope of services more transparent.

An example of a statistical base can be the European option, which includes (Eurostat, 2018):
– trends in innovation in Europe (The Trend Chart on Innovation in Europe) - dissemination of successful innovation experience;
– European Innovation Scoreboard - annual data on the state of science, technology, innovative activity of companies and the innovation environment, including international comparisons with other countries;
– The Innobarometer is a special study of individual innovation policy parameters, including the company’s attitude to change, data on the volume of costs of innovation and the impact of domestic and foreign markets on the efficiency of innovations;
– the activities of the electronic information service on R&D in innovation policy - CORDIS, which provides information on the possibility of using the results of project work.

According to the annual monitoring of The Innobarometer, the EU countries are subdivided into the following fairly stable groups (Table. 2).

<table>
<thead>
<tr>
<th>Groups of countries according to the level of development of innovations</th>
<th>The countries of Europe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovative favorites</td>
<td>Great Britain, Denmark, Germany, Finland, and Sweden</td>
</tr>
<tr>
<td>Those that catching up favorites</td>
<td>Austria, Belgium, Ireland, Luxembourg, the Netherlands, and France</td>
</tr>
<tr>
<td>Medium innovators</td>
<td>Greece, Spain, Italy, Cyprus, Portugal, Slovenia, Czech Republic, and Estonia</td>
</tr>
<tr>
<td>Catching up countries</td>
<td>Bulgaria, Hungary, Latvia, Lithuania, Malta, Poland, Romania, and Slovakia</td>
</tr>
</tbody>
</table>

Source: Designed by the authors

According to the global index of innovation, which is formed on the basis of several indicators, the following leading countries can be distinguished: Innovative environment within businesses (R&D, FDI and technology transfer costs) - Sweden.

Innovative ecosystems (UNDP. Human Development Report, 2018):
– the state of cluster development is Italy, Sweden, Finland, and Great Britain.
– innovation culture - Great Britain, Germany, Belgium, and Finland.
– cooperation between universities and various branches - Finland, Sweden, Denmark, and Great Britain.

Openness to intranet and foreign competition (indicator of trade barriers, average weighted rate of import customs tariff, intensity of intra-national competition) - Denmark and the Netherlands.

– The report of the European Commission’s expert group describes services that have a significant impact on the business environment and may potentially change the direction of innovation development.
– The so-called “transforming services” include:
– services related to the creation of networks, the establishment of business contacts that provide interaction between consumers,
- companies and participants in the production-sale chain, and also improve the distribution of goods and information exchange.
- municipal and infrastructure services (services of telecommunication, power companies, garbage collection companies, etc.).
- Business services based on a large amount of professional knowledge, the production of which is carried out through close interaction with customers, in order to improve their technologies, organizational processes and models, and exchange knowledge and experience between different sectors (Gruszczak, 2016).

Focusing on these types of services is in line with the principle of enhancing the orientation of the EU’s innovation policy to improve the value chain and the conditions for the development of universities, research institutions, private companies, government agencies and consumers (Davidavičienė, et al., 2019).

Let’s consider the main models of observance of innovation safety in services in EU countries:

1. The classic scheme of research and development (R&D), which can be found mainly in large high-tech companies.

2. The replication of professional solutions is most often traced in the production of intellectual services. Specialists of such companies, due to their high qualifications, often develop unique client-focused solutions. Such innovative practices can be disseminated through networks, associations and other professional communities. Many consulting companies and representatives of other sectors (such as advertising and design services) follow this model (Kirchner, et al., 2015). The most important task for them is the search and adaptation of innovations created by professionals in practice, and knowledge management is aimed at solving this particular problem.

The neo-industrial model occupies an intermediate position between the two previous ones. Together with innovations generated by specialized departments for R&D or innovation, there are spontaneous innovations that are born in solving current practical problems.

The purposeful innovation strategy is found in large service companies. The innovation process is carried out in the form of projects, which are usually implemented by temporary teams recruited from different divisions. They work strictly according to project management rules, often under the strict guidance of marketing departments (Labanauskis, et al., 2018).

The entrepreneurial type of organization of the innovation process is characteristic for start-up companies, which offer more or less radical innovations of both technological and managerial nature. Similarly, the small, but fast-growing firms and companies that make online services, etc., are developing in many sectors of service market. But usually they adhere to this trend for a short time and quickly switch to another type of innovative behavior.

“Amateurish” (unprofessional) type of innovation management is found in small companies that make low-tech services related to the maintenance of material objects (eg, cleaning or catering). These are classical non-client sectors that borrow most of the innovations from other sectors (for example, from industry), although they can themselves develop innovations in response to changes in legislation and demand. The personnel and managers of such companies can also generate innovation, but usually of an improving nature.

The network type covers a set of companies that operate jointly and have common standards and procedures. There may be a dominant company in such a network that is characterized by the spread of innovations, for example, in e-commerce, from which customers require standard trading conditions. In a number of service industries that make fast food, provide hotel services and some professional services, innovations are distributed through franchising network. It has been found that innovative organizations in many EU countries apply the following practices or their combination (Hollis, 2010).
The internal and external R&D, patenting, and registration of prototypes and copyright) are new for market innovations (this practice implies product innovations and technological aspects of innovation that are new for the market.

Marketing innovations (practice implies the introduction of new innovations for the firm (not for the market) and bearing costs for marketing associated with them).

The modernization of processes (practice refers to process innovations, the purchase of machinery and equipment, other knowledge, training and retraining of personnel). This factor reflects the combination of technological and non-technological components. The innovative activities are extended (practice related to non-technological aspects of innovation). The usage of advanced management techniques, improvement of organizational structures, and new marketing strategies (Balzacq, 2010).

The discrepancy between national models is observed mostly relative to innovation that are new for the market, and the similarity is observed within the framework of modernization and advanced innovations. One way or another, countries in one form or another practice new innovations for the market. This option is related to the generation of own technologies, which proves the high factor load that comes from internal research and development, as well as intellectual property rights.

Conclusions

The significance of the service sector is related not only to the predominance of the economy structure, but also to the formation of key factors in economic growth in its sectors. Trade in services is one of the most dynamic sectors of international trade. The group of other commercial services is allocated more dynamically. The share of other types of business services in trade in commercial services is 48%.

The main suppliers and consumers of other business services are the countries of Europe, EU and, in particular, the United States. The fastest growth demonstrates the trade in computer and information services, insurance services, telecommunications, and other business services.

The development of the world market for business intelligence services takes place under conditions of intense competition and under the influence of non-price factors. The leading services group in the EU includes telecommunications, credit-and-financial services and insurance services, and business services. In most EU countries, services in the field of marketing, advertising, leasing, engineering and architectural services, accounting services, audit services, as well as non-technical types of business services are at the forefront of growth.

The business services bring the greatest contribution to the category of intellectual services (an average of 11%). The average indicator of the share of intellectual services in gross value added by EU countries is 20%.

There is a high innovation activity in the service sector in the EU countries. In general, services of an informational nature (financial services, business services) show a higher level of innovation. The predominance of non-technology-related innovation services will be explained by the fact that they have more instrumental nature in the service sector.

The category of services that affect the business environment and potentially can change the direction of innovation development in EU includes so-called business services based on a large amount of professional knowledge, the production of which is carried out through close interaction with customers. The focusing attention on these types of services is in line with the principle that means strengthening the orientation of EU innovation policy and safety.
References


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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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