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CONTENTS

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SUCCESS STORIES FROM POST WAR RISK MANAGEMENT: THE CASE OF ISRAEL

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Key words: risk management, economic growth, recovery, economic security

Introduction. Current economic situation in Armenia is controversial in terms of existing risks and opportunities. Further growth depends not only on utilizing local resources but also considering success stories of post-war recovery from other countries. We suggest to pay particular attention to the trends and development in Israel after the war. In the post-war period, the state of Israel faced a number of risks at once. The economy was poor and production was underdeveloped. The area on which the state was created was almost completely devoid of minerals, besides, most of it was deserted. In addition, from the very first days of its existence, Israel had to gradually neutralize serious threats.

Scientific novelty. Compared to other studies, we do not intend neither to exagerate the positive trends in Israel, nor to underestimate the progress made in this relatively young state. Instead, we attempt to comprehend the threats and challenges for the nation since the first year of its' existance and reveal national competitive advantages that served a solid ground for maintaing proper level of economic security and progress. On the one hand, Israel had to allocate large sums to protect itself from its neighbors, on the other hand, the absorption and integration of many repatriated Jews into the economy required even greater allocations. At first the country did not even have enough food, they were distributed to the population by coupons.

Methodology. Methods used in our study are those tools and approaches used by the scientists who examine the pecularities of recovery after war, particularly, concerning the recovery and reconstruction of economy in Israel. We mainly focus on issues related to economic growth, competitiveness, facilitating exports, as well as the ways and methods used economic analysis. Comparative analysis of economic indicators with other countries are also used in our study.

Literature review. Many studies examine Israel's economy starting from the foundation of the state. Some researchers analyse the natural resources of the nation such as water, energy, other resources, while the others observe the indicators related to the ability of the state to build and maintain proper level of food security, energy security, demographic security and others [Amer, 2017, 46-49]. Many scholars such as Zafar Adeel, Benno Böer, and Walid Saleh continuously study the trends and economic deve-

lopments in Israel. Solid resource base of analysis is considered the World Facts Book to examine relevant data, as well as the U.S. Overseas Loans and Grants (Greenbook), the U.S. State Department, and the Missile Defense Agency. Notes, the USAID Data Services, etc. Comparing data related to the indicators of economic freedom of Israel is characterized by 10 factors: trade policy, state financial resources, state intervention, currency policy, foreign investment and capital flow, financial problems, wages and prices, property rights, laws and the market. We consider different approaches of scholars to develop an objective approach on mentioned topics. According to Walter Block, liberalization of the economy is the absence of state coercion to provide the necessary measures, distribution, distribution and consumption of goods and services to citizens. According to Gwartney and Lawson, liberalization of the economy means that people can work, produce, consume freely, and invest where they can be most productive. We also pay attention to economic liberalization of Israel as a process that leads to the reduction of state control over investments, goods and services, labor, markets, and regulation, mainly through market mechanisms. Also, according to Professor Richard Roll, in order be able to achieve the desired economic growth and prosperity, each of economic factors must have a positive impact. It is also worthy to consider the role of economic advisers in Israel's economic policy [Schiffman, Young, Zelekha, 2017, 7-16]. New approaches and policy recommendations are also considered in line with current global threats and challenges [Greenbaum, Arnon, 2021]

Analysis. The Israeli economy faced serious difficulties after the war. Since Palestine did not have rich natural resources, large territory, and good business opportunities, one could not expect the Jews to emigrate for material reasons. Ideological motivations became more important for them. Initially, the economic development of the fledgling state was greatly influenced by the aftermath of the Arab-Israeli war, as well as the problems associated with resettlement and the creation of economic foundations. The creation of relatively normal conditions for recovery took about six years, during which inflation reached 43%. During the first years of Israel's existence, the economy was on the verge of bankruptcy several times, so the state took urgent measures, such as controlling the prices of basic necessities and restricting the use of foreign currency. The population initially supported these measures, but for a long time the state could not effectively apply these restrictions.

The first sector of the economy that stood up was agriculture. The cornerstone of this process was the kibbutzim, agricultural cooperatives, in which practically everything was under the general control of the kibbutzim (there were no internal monetary settlements, there was complete equality, the "communal principle of each according to his ability, to each according to necessity" operated). Oranges were one of the most important commodities, and by selling them abroad, the Jewish state not only earned its first

income in foreign currency, but also gained a reputation as an innovative, dynamically developing society. Due to the sector in the region, today Israel provides about 95% of its food with its own agriculture: This is a major achievement, especially in the context of the global food crisis and high food inflation, which continues in 2022. At the same time, a large number of goods are exported to other countries of the world, despite the fact that only about 3% of the population is engaged in agriculture. In addition, despite the hot climate, Israel has achieved unique results in almost all areas of agriculture, in particular in the field of animal husbandry, Israeli cows are absolute world champions with high milk yield.

As a result of proper risk assessment and targeted management, the defense-military industry began to develop almost in parallel with agriculture in the post-war period. This happened because other countries refused to supply arms to Israel, they had to learn how to defend themselves, to survive, to gradually improve the weapons produced, the ammunition. In fact, the first products of the Israeli military industry were quite primitive, but over the years, the achievements of Israeli scientists began to be incorporated into the country's defense-military industry. Israeli military engineers have practically excelled in the design and production of drones, laser technology, specialized electronics, missile technology, tanks, ammunition, and certain types of small arms. As a result, Israel's defense and military products are in high demand around the world today.

The period from the mid-1950s to the mid-1970s can be described as a period of skilful economic risk management, the accelerated growth of the Israeli economy. During these years, the clear structure of the Israeli economy's GDP was formed, the economic dependence on other countries was reduced, which was one of the main threats to the economy. During that period there was a significant improvement in production assets, hundreds of enterprises were built, new production lines and new equipment were added to the existing ones. Accelerated industrialization - industrialization took place with the direct support of the state.

We are convinced that the main problem of this period that the government of the country was able to solve was the stimulation of the growth rates of consumption.

Among the potential challenges of the post-war period was the crisis that erupted in early 1965, when it became apparent that opportunities for further large-scale economic growth were practically exhausted. First of all, the crisis occurred due to the completion of several large national projects at once. These included the construction of the Pan-Israel Pipeline, which supplied water from north to south, the Negap desert, the port of Ashdod, the Potash mining plant in the Dead Sea, and the completion of a number of other works. All this led to a sharp decline in the activity of the real sector of the economy with the support of the state, a decrease in the volume of public works and jobs.

In addition to objective factors, the slowdown in growth was also influenced by the state's economic policy. At this stage, the government. He feared that a dynamic increase in income, as a result, an increase in demand could lead to a deterioration in the trade balance and inflation [Hanke, Krus, 2013]. Therefore, the government decided to artificially slow down the rapid economic growth with appropriate levers, raising interest rates on loans, reducing public investment and injections. However, already in 1966 it became clear that the controlled economic growth was not achieved, the economy found itself in a deep crisis. The number of unemployed doubled to 10% of the able-bodied population, industrial production fell sharply, and for the first time in that period a negative immigration balance was recorded. Due to the decrease in immigration, the growth and volumes of the construction sector were reduced. Finally, a significant negative factor was the sharp escalation of the political situation in late 1966 and early 1967.

After the war of 1967, the state again took measures to return the economy to the main course of dynamic growth. After the military operations, the military industry became the axis of industry development. During these years, a reorientation began to foreign markets, satisfying the demand abroad.

US financial support played an exceptional role in the establishment of the state of Israel, the development of the economy, and the growth of the competitiveness of the NIS. Below is the amount of US aid since World War II.

Table 1. Total US foreign aid to Israel in 1946-2020. Millions of dollars [1]

Fiscal Year	Armed Forces	Economy	Missile Defense	Total
1946-2018	97,907.700	34,326.000	6,411.409	138,645.109
2019	3,300.000	-	500.000	3,800.000
2020	3,300.000	-	500.000	3,800.000
Total	104,507.700	34,326.000	7,411.409	146,245.109

However, a number of complex issues remained unresolved, the main one being the foreign trade deficit, which doubled between 1966 and 1970. At the same time, the state budget deficit increased (it amounted to 12% of GDP in 1972), mainly due to the increase in financing of social needs and defense spending. The growth of real incomes in the country exceeded the growth of labor productivity in the economy. As a result, inflation increased to 14% in 1972. And further, 1973-1974 can be described as a period of transition from the rapid development of the Israeli economy to a more "mature" stage

[1] Sources: U.S. Overseas Loans and Grants (Greenbook), the U.S. State Department, and the Missile Defense Agency. Notes: The Greenbook figures do not include missile defense funding provided by the Department of Defense. According to USAID Data Services as of March 2020, in constant 2018 U.S. dollars (inflation-adjusted), total U.S. aid to Israel obligated from 1946-2018 is $236 billion

[Hanke, Bushnell]. At the same time, in the early 1970s, the growth of the working capacity of the population was quite limited, firstly, due to the reduction of immigration, secondly, the increase in the number of armed forces, expenditures for that purpose, as well as the increase in military service. These reasons, in turn, led to a significant outflow of labor from the industrial sector. At this stage, the share of those employed in the public administration and other public services increased. In addition, increasing the living standards of the population reduced the wage-productivity ratio. On the other hand, the beginning of the slowdown in economic growth began in 1973. coincided with the growth of gross consumption. Negative trends - the economic risks caused by them increased again with the oil crisis, which occurred in 1973, the country's economy led to a new phase of decline. Inflation in the same year was 20%, and in 1977 it reached 44%, GDP in these years was 3-4%, which is approximately equal to population growth, the volume of capital investment and construction decreased, recording negative trends for the first time. Monetary-monetary systems were not left without negative tendencies. Although the exchange rate was set by the government in those years, however, the trade balance failed to improve; in 1974 it depreciated against the US dollar, from 4.2 to 6 lira. In addition, different exchange rates were set for different areas of activity, including hidden taxes or subsidies, depending on government policy. For example, in 1975 a new "floating exchange rate" policy (Hebrew: "זוחל פיחות") was announced, which led to the gradual devaluation of the lira at a slower pace than usual. Later, the Israeli economy underwent monetary reforms to curb inflation. The Israeli "Shekel" currency was replaced by "new shekel", one new shekel was worth a thousand old shekels. This is the third monetary reform in the history of Israel after the Palestinian pound was replaced by the Israeli pound and the Israeli pound by the shake.

The need for more effective risk management in these conditions led to Ehrlich's famous reforms, which included the long process of currency liberalization from 1977 to 1984[1]. The main goal of the reforms was to manage the existing risks by reducing state regulation and creating a market economy. Liberal economist Milton Friedman believes that Israel was in a unique, extremely dangerous economic situation at that time, when the general state expenditures were approximately equal to the gross national product. Friedman urged the government to cut spending and intervene in all sectors of the economy. Friedman warns Israel of dangers of hyperinflation [Cagan, 1956].

As a result, almost all restrictions on currency transactions were removed, the fixed exchange rate of the lira was eliminated, and from now on it was determined by the balance of supply and demand.

[1] The new government was headed by Menachem Begin, and Simcha Erlich was appointed Minister of Finance, who initiated a large-scale reform called the "Economic Revolution". (המהפך הכלכלי):

In addition, a number of indirect taxes were eliminated, such as the foreign travel tax, and VAT was reduced from 8% to 12%. Inflation reached triple digits for the first time in 1979, exceeding 111%, after which Ehrlich was forced to resign. The results were catastrophic. The devaluation of the money entered a phase of hyperinflation, reaching 450% in 1984 and 500% in the first half of 1985. In the summer of 1985, an economic stabilization program was launched, which had two main goals: to reduce the budget deficit and to fight inflation [Schiffman et al., 2017, 7-16]. The main points of the program were:

• Radical reduction of budget expenditure items, first of all all types of subsidies;

• Reduction of real wages on the farm to reduce domestic demand, increase the competitiveness of Israeli exports, reduce unemployment;

• Significant devaluation of the dollar against the dollar; stabilization of the exchange rate as much as possible at a new level; its long-term maintenance;

• Freezing prices for a limited time.

It should be noted that these reforms were significantly facilitated by the broad public consensus on the need to curb inflation, as well as the compromises reached in negotiations with the business sector and trade unions. The main concession by the government was the reversal of the decision to lay off civil servants, and the unions, in turn, agreed to a significant reduction in salaries in the public sector. At the end of 1985, it became clear that the immediate goals of the program had been achieved: the annual inflation was 20%, the budget deficit was significantly reduced, this trend was maintained for the next three years, and the regulations were somewhat weakened. For fiscal reasons, the budgets of 1986-1989 did not fully include the cuts originally planned in fiscal policy. The success was due to external factors: a significant drop in world oil prices, a grant from the United States of one and a half billion dollars. In 1986, a new currency was introduced, the new Israeli shekel, which replaced the shekel. The exchange was made at the rate of one thousand. Despite a significant improvement in a number of indicators, the strategic problem of risk management was not solved, economic growth remained at the level of the crisis of 1965-1967.

After many years of stagnation in the economy, one can single out the positive phenomena of the growth of production by 8% in 1986-1987, as well as the growth of investments by 12%. During these years the country's foreign debt was also reduced. As a result of curbing inflation, it was possible to shift the activities of entrepreneurs from commercial, speculative activities to the real sector. However, the anti-inflation policy led to a slowdown in economic growth. The artificial overvaluation of the shekel exchange rate led to a decline in the activities of both exporters and import substitute producers. Militarization also affected industrial production. But the military industry, in turn, also had an impact on economic production, as there were production lines that

produced goods for both the military and the civilian spheres. These are dual-use products that are getting tighter and tighter [Greenbaum, 2021]. Until the 1980s, high-tech production also developed rapidly. Thus, these decades have become crucial years compared to the previous growth rates. During this time, however, Israel's economy underwent significant reconstruction. At the same time, these years had a negative impact on Israel's foreign relations ահան exports.

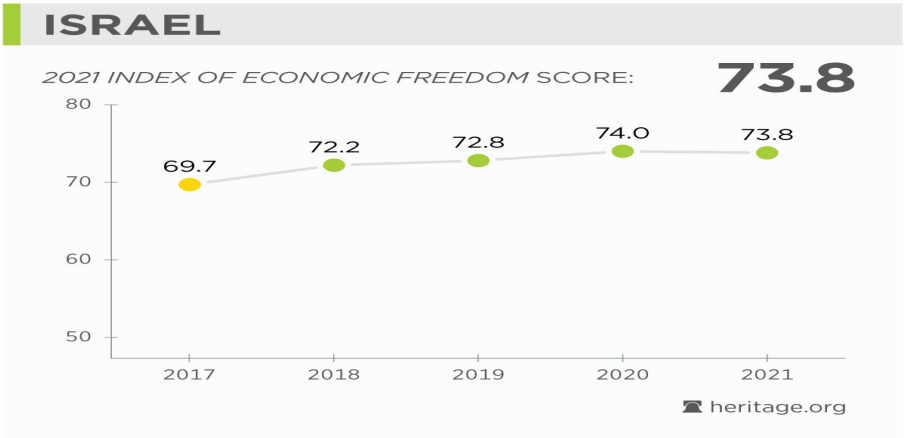
Israel also had good arms exports in the 1980s. However, in the mid-1980s, the highly diversified production of arms for export began to decline. There were several reasons, one of which was the more profitable offers from the West. In the 80s and 90s, the Israeli economy was quite developed in the production of textiles, household goods, as well as production and export, which is considered a traditional branch of diamond processing. Using imported raw materials, Israeli diamond production has taken a leading position in the market. Despite the high indicators of industrial production, agriculture was also experiencing some development. In the 1980s, Israel's fruit and vegetable exports quadrupled to $ 600 million. It was facilitated by the climatic conditions.

In the first half of the 1990s, the Israeli economy flourished again. This was followed by mass immigration after the collapse of the USSR. It is estimated that more than 700,000 people immigrated to Israel from the USSR, as a result of which the population of Israel increased by 12%. Among them were many highly qualified specialists. After the immigration of the population from the USSR, large-scale construction began in the country, and the labor market was also greatly replenished with highly qualified personnel. This stimulated the growth of high technology. The establishment of relations with other countries and the reduction of the military budget also contributed to the growth of the economy. During these years, Israel was one of the fastest growing economies in the world, among the economic growth indicators of developed countries, the country had a leading position with many indicators of economic growth.

The temporary improvement of the situation in the region, which was connected with the Norwegian agreements in 1993 and the signing of the peace agreement with Jordan in 1994, led to a sharp increase in foreign investments in the country's economy. Later, in 1997, the IMF included Israel in the list of industrialized countries. External relations were of great importance for the development of the country, which enabled the import of modern services and goods, thus modernizing its production assets. Funds received from abroad contributed to the development. With a per capita financial assistance of $ 148, Israel ranked first in the world. As a result, the country's economic freedom improves, which is characterized by a number of integral indicators.[1], which are

[1] Each year, the Heritage Foundation's Wall Street Journal evaluates the following 10 factors by country: 1. business liberalization, 2. trade liberalization, 3. tax liberalization, 4. State participation, 5. currency liberalization, 6. investment liberalization, 7. financial liberalization, 8.

considered in two ways. The first is the Economic Freedom Index (ECI), which has been calculated for 179 countries since 1995 by the Heritage Foundation and the Wall Street Journal. The second version, the World Economic Freedom Index (WTI), has been used by the Fraser Institute since 1970. Figure 1 summarizes the economic freedom index calculated for Israel for 2017-2021. in terms of:



Today, Israel's scientific achievements have become a real driver of development in all areas of the economy. The country has become internationally competitive in all areas of science, high technology, from pharmaceuticals to aviation, mechanical engineering, metalworking, agricultural technology, industrial chemistry, and diamonds. The world leadership of the Jewish state has achieved impressive results in the number of scientists, high-tech specialists, scientific publications, registered patents, research and development costs. As a result, Israel has become one of the largest centers for the development of electronics, computer technology, IT technologies, telecommunications equipment.

Conclusion. Thus, the international experience of risk management has many instructive aspects, it can be useful for the recovery, stabilization and development of the Armenian economy in the post-war period. At the same time, when localizing the international experience, one can take into account the peculiarities of Armenia both in terms of geopolitical and new challenges in terms of choosing this or that measure of reforms

property rights, 9. labor liberalization, 10. liberation from corruption. According to Professor Richard Roll, in order for a country to be able to achieve the desired economic growth and prosperity, each of these 10 factors must have a positive impact. In terms of the index of economic liberalization, the states are divided into five groups. 1. Free when the average score is 80-100, 2. Almost free when the average score is 70-79.9, 3. Balanced free, 60-69.9 average score, 4. Partly government dependent when 50- The average is 59.9, 5. It depends entirely on the government when the average is 0-49.9.

in the face of epidemic, domestic economic, political, political problems and trends. In addition, it is possible to take into account the degree of integration of our country in regional and global processes, as well as the current level of competitiveness and realistic opportunities to improve it.

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Success stories from post war risk management: the case of Israel

Key words: risk management, economic growth, recovery, economic security

As the history of Israel's economic development shows, the small area, the small population and the lack of rich natural resources are not an obstacle to economic growth, the development of science and technology and the improvement of living standards. It was facilitated by the entrepreneurial inclinations and qualities of the people, the support of foreign countries and the Diaspora, as well as a relatively stable and healthy political system. Despite the difficult conditions, the economy resisted the absorption of many immigrants, ensuring the security of the state, creating a modern economic infrastructure. In particular, in the early 1990s, the number of repatriates arriving in Israel increased sharply, mainly from the former Soviet Union (see Greater Alia). In total, more than 600,000 people arrived between 1990 and 1996. In the short run, the wave of immigration led to a sharp increase in the budget expenditures for their adoption, housing and maintenance at the initial stage, an increase in unemployment, which exceeded 10% of the able-bodied population. However, in the mid-1990s, it became clear that factors such as the emergence of a large number of skilled workers in the labor market and the sharp increase in domestic demand had a positive effect that transcended temporary difficulties.

THE ROLE OF PARLIAMENTARY CULTURE IN THE PROCESS OF PUBLIC ADMINISTRATION AND PUBLIC POLICY ANALYSIS

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Keywords: parliamentary culture, parliament-society dialogue, public policy analysis, political participation, public interest

Introduction. The role of parliamentary culture is crucial to public administration and public policy analysis. Due to the precedence of the political dialogue between the parliament and the society, this topic is relevant for a detailed study in public administration and public policy analysis areas. The parliamentary culture is constantly transforming based on national interests and peculiarities at different stages of civilizational development. In the process of public administration and public policy analysis, it is vital to ensure the effectiveness of the political system, which is especially promoted by the development of parliamentary culture. The realization of national interests and their effective alignment with public ones, is a prerequisite for cooperation between the society and the parliament in the processes of democratization [Savchenko, 2013, 76-89].

It is necessary to apply an appropriate system of checks and balances, which will allow the finding of common ground between the public authorities and the society, considering the role of parliamentary culture in the process of public administration and public policy analysis.

Methodology. The selection of the study methods for this work was based on the imperatives of modern political development. The study of the role of parliamentary culture was carried out in the framework of transitional studies, consolidation studies, and political hermeneutics. Both systematic and dialectical methodology of development has been applied in the above-mentioned areas, combining the institutional, social-psychological, civilizational aspects of parliamentary culture in the political context of public administration and public policy analysis. The theoretical basis for the research was the works and analyses of well-known theorists on different stages of political development, which enabled a comprehensive and multi-level study of the role of parliamentary culture in the process of public administration and public policy analysis.

Literature review. There is no shortage of the "parliamentary culture" definetion in the political science literature. The various functions of parliamentary cul-

ture were observed by Plato, Aristotle, N. Machiavelli, T. Hobbes, J. Locke, J. J. Rousseau, I. Kant, Y. Herder, Hegel, J. Mill, H. Spencer, G. Le Bon, G. Almond, S. Verba, N. Bogdanova, F. Burlatski and others. They emphasized the importance of the parliamentary culture's political, communicative, socializing, cognitive, regulatory, consolidating, and integration functions in their works [Gerder, 1977; Almond, Verba, 1992, 122-134; Aron 1993; Il'in 2010, 69-82]. In addition, the study of the socio-political nature of the parliament and the classification of political representation were present in the works of A. Birch, E. McLean, E. Haywood, and others. According to F. Burlatski, the parliamentary culture is the institutional and non-institutional historical and social experience of a national-supranational community, which has its impact on the political consciousness of the state and society, on the political behavior of public administration entities, on the formation of political assessments of political developments by the society [Burlatski, 1970, 49-50]. Finally, parliamentary culture is an axiological field formed during the cultural and historical development processes and based on democratic consolidation and human rights protection mechanisms.

Analysis. Parliamentary culture ensures the effectiveness of the dialogue between the society and the state in the process of public administration and public policy analysis. The parliamentary culture development, its institutional peculiarities, and structure contribute to the formation and evolution of the content of public opinion. In this backdrop, Almond and Verba, referring to the issues of civic participation, argue that the stability and viability of a democratic political system are conditioned not only by the constitutional-legal nature of democratic institutions but also by the revaluation of the political system, its inputs, and outputs, as well as a citizen's role in that system [Almond, Verba, 2014, 283-322].

There are two different approaches to the interpretation of parliamentary culture in contemporary political research. Proponents of the first approach argue that parliamentary culture is intertwined with "state science," in which parliamentary culture is seen as a form of government. In this sense, parliamentary culture is considered as a medium of organizing public administration system, ensuring effective separation of powers [Palonen, 2018, 219-227]. The proponents of the second approach argue that parliamentary culture is based on control functions and societal values.

Parliamentary culture is often interpreted as an embodiment of political consciousness. In this regard, the American researcher Jennings considers the primary function of parliament to be criticism but not governance. According to him, the criticism is not aimed at a significant change in government policy, but at the establishment of prostate political consciousness. Parliamentary culture should guarantee the formation of political assessments of the speeches made in parliament by the public [Jennings, 1959, 472].

Political consciousness acts as a balancing mechanism between the legislative and the executive branches of power. The members of society, who hold civic culture, have the exact idea about the political system, their place, and their role in it; they also enjoy effective mechanisms for participating in political life, which leads to a noticeably high level of political consciousness in the society [Saroyan, 2015, 58].

There are other definitions of the "parliamentary political culture" term in the political science literature, which can be classified in narrow and broad meanings. In a narrow meaning, parliamentary culture is parliamentary ethics, which is viewed as a socio-political phenomenon conditioned by political relations [Achkasov, 2004, 173-191].

Parliamentary culture, being in the institutional and non-institutional spheres, is a vital component of the public policy analysis process, which is based on political-legal values, interests, and motives [Vorob'ev, 2004; Konstantinova, Lavrikova, 2012, 212-217]. In the context of postmodern political developments, parliamentary culture includes the axiological system of parliamentary governance and public relations, on which the influence of civil society is significant [GOPAC]. Parliamentary culture is a system of axiological orientations and motives, which determines the effectiveness and efficiency of the parliament as a representative body [Kovbenko, 2009].

Due to the national and historical peculiarities, the substance of the parliamentary culture is supplemented by the traditions, value system, customs, as well as religious and moral notions rooted in the society. Thus, the parliamentary culture, covering a wide range of political, legal, social, and cultural relations, reproduces the legal order through legislative activities while also regulating to some extent the social relations in the legal and political platforms. In this framework, the parliamentary culture at different levels of its development contributes to the transformation of society, influencing social development, which promotes the raising of the level of political consciousness among society members, as well as it leads the society to the path of modernization. Due to this circumstance, the role of formation and development of parliamentary culture is paramount in the public policy analysis.

In a broad meaning, parliamentary culture is a high level of consolidation of the public administration system, as well as continuous cooperation between the state and society [Herbert, 1996, 24]. Parliamentary culture is an indicator of the level of legitimacy of public administration institutions, and at the same time, it reflects the level of public participation in the platform for dialogue between the state and society [Ilie, 2018, 133-145]. In this setting, it is necessary to focus on the attitudes towards the parliamentary governance system and democratic representation by the political ruling elite and society.

In the process of transition to democracy, the representative institutions of the states need to ensure the effectiveness of the parliamentary culture and the political system of government per international standards. The gap between the state and the society deepens, undermining the institutional foundations for the establishment of parliamentary culture until a dialogue based on national identity and historical memory is established between the parliament and the society [Ganghof, 2021, 66-86].

Within the framework of parliamentary culture, the public administration system possesses the following distinct advantage: considerable representation of the country's population in making fundamental decisions for the state governance [Alekseeva, 1908, 18-20]. In the case of the effective development of parliamentary culture, it can be stated that the process of making the most significant decisions for the sake of the country is more prolonged and detailed as different political forces express their opinions on the decisions to be taken and, therefore, as a result of different approaches, a more expedient and rational decision is made. Analyzing this provision in more detail, political scientist Melville notes that the advantages of parliamentary culture are so sublime and unprecedented that modern political thought is faced with the problem of conceptual renewal of political changes and political development, taking into account the disparate nature of post-communist transformations [Melville, 2004, 25-47].

In the process of public administration and public policy analysis, ensuring public participation guarantees the combination of national and public interests based on the existing political dialogue between the parliament and the society. Political dialogue is a continuous and serviceable activity between the parliamentary parties, ensuring the realization of people's right to be represented and involved in the public administration system. When the national dialogue is disrupted, there is a crisis of trust and mass marginalization between the parliament and the society, which leads to a sharp decline in the internal and external image of the parliament as a people's representative body. Awareness of the national interest by the parliament creates the need to make the transition from object to the subject during its socialization process [Ulitin, 2003, 129-131]. The effectiveness of the dialogue process is primarily conditioned by the existence of a political regime appropriate to the government system and a national ideology based on consensus. The culture of dialogue is identified with the legitimacy of the public administration system [Banerjee, 2012, 16-19]. The existence of the latter is bound to the axiological dimensions of political relations between the parliament and the society and to the social guarantees' provision to ensure public safety.

The political consciousness and beliefs of the political elite, of civic representative institutions, of the society, as well as the dialogue between the state and the public, is vital for the establishment and further development of the parliamentary culture. Due to the coalition-building and deliberation features, the parliamentary culture allows for a

more responsive government. When a system is better able to represent a vast array of people, it is better equipped to respond if changes in the public administration need to occur [Rachel James, 2021, 1-13].

Parliamentary governance procedures include the priorities of managerial activity: professional training, the culture of parliamentary ethics, the ability to respond to socio-political issues promptly, creation of a legal framework following national specifics [Ledjaev, 2001, 43]. These are two different areas of parliamentary governance regulatory activities. Otherwise, there is a conflict of interest, which leads to the complete loss of the parliament's representative function.

Scientific novelty. Our research work provides an opportunity to prove the scientific novelty of this article. Thus, the novelty of this paper is that the awareness of national interests is a necessary condition for cooperation between the society and the parliament, which must be converged with the public interest. Political dialogue is a central component of parliamentary culture, ensuring public representtation and engagement in the public administration system and decision-making process.

Conclusions. Summarizing the theoretical-ideological bases of parliamentary culture in the process of public administration and public policy analysis as well as analyzing the uninterrupted interaction of structural and content components of the concept, we came to the conclusion that parliamentary culture is the primary stimulus in the process of public administration and public policy analysis and which ensures the broadest representation of public participation in the process of political decision-making and their implementation. The practical application of the principles of parliamentary culture ensures the smooth operation of the state-society dialogue mechanisms. All this enables the effective development, implementation, and analysis of public policy at different levels of the public administration system based on the public interest.

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The Role of Parliamentary Culture in the Process of Public Administration and Public Policy Analysis

Key words: parliamentary culture, parliament-society dialogue, public policy analysis, political participation, public interest

Parliamentary culture plays a key role in the public administration and public policy analysis process, as its development contributes to raising the public's political awareness and ensures effective public participation in public administration and various stages of the public policy development, implementation, and analysis processes. Parliamentary culture contributes to the establishment of a dialogue between state and society aimed at increasing the efficiency of the public administration system. The selection of the study methods for this work was based on the imperatives of modern political development. The study of the role of parliamenttary culture was carried out in the framework of transitional studies, consolidation studies, and political hermeneutics. Both systematic and dialectical methodology of development has been applied in the above-mentioned areas, combining the institutional, social-psychological, civilizational aspects of parliamentary culture in the context of public administration and public policy analysis. Summarizing the theoretical-ideological bases of parliamentary culture in the process of public administration and public policy analysis as well as analyzing the uninterrupted interaction of structural and content components of the concept, we came to the conclusion that parliamentary culture is the primary stimulus in the process of public administration and public policy analysis and which ensures the broadest representation of public participation in the process of political decision-making and their implementation.

CLASSIFICATION OF THE REGIONS OF THE REPUBLIC OF ARMENIA ON THE ISSUES OF STRATEGIC MANAGEMENT

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Key words: quality of life, integrated index, socio-economic development, unemployment, migration

Introduction. It is known that states had been formed to guarantee the well-being of nations, and the final objective of governmental authorities was to enhance the quality-of-life of the population. Hence, improving the quality-of-life of the population itself should be the basis for the strategic planning of socio-economic development of the region. The advantage of this medium is that it doesn't depend significantly on subjective assessments, personal relationships, and social behaviors,which allows to measure progress without relying on personal assessments. The main issue with this concept is that the quality-of-life is a multifaceted standard and difficult to measure.

Literature review. Extensive research on the quality of life has been carried out since the mid-1960's. However, the content and structure of the concept of "quality-of-life" remains controversial to this day. L.Osberg and E. Sharp measured the quality of life by “Economic Well-being” index [6], A. Sen “Human Development” index [5], and R. Veenhoven “Happy Life-Expectancy” index 1 [7]. Among the modern models for quality-of-life assessment integrated index of quality-of-life is classified, developed by researchers at the Central Economic Mathematics Institute of the Russian Academy of Sciences under the supervision of S.A. Ayvazyan [2].

Methodology. The integrated index of quality of life is a hierarchical system of interconnected indicators, that enables us to evaluate the quality of life of the population based on public statistics, with three integrated indicators: population quality, population well-being, social quality. The formative algorithm for calculating the integrated quality of life index is as follows:

1. Accumulation of output statistical indicators
2. Homogenization of output statistical indicators
3. Distribution of indicators in quality-of-life categories
4. Determination of the significance of the quality of life in analyzed category
5. Integrated rates calculation in quality-of-life categories

6. Region ranking by Integrated rate of quality-of-life values[1]

Research. The official statistics of 2020 were used to implement the classification of the regions of the Republic of Armenia according to the Integral Quality of Life Index. Preliminary data were divided into three homogeneous groups: quality of the population, level of well-being of the population, quality of the social sector.

The following outline data for the integrated level of population well-being has been considered: GDP per capita of the region , the cost of average monetary income per capita according to the minimum standard of living measured by CPI, the number of people with low incomes or extreme poverty below the level of standard of living, the ratio of global income to the richest 20% and the poorest 20% of the population, space security index per capita, and the number of emergency housing in housing stock.

The results of the calculations of the "Quality of Well-being" category of the Integral Quality of Life Index are presented in Table 1.

Table 1. Integral Quality of Life Index by "Population Well-being Level" category

RA region	The Integral Quality of Life Index	Position
VayotsDzor	1,79	1
Syuniq	4,16	2
Tavush	4,62	3
Ararat	7,14	4
Aragatsotn	7, 34	5
Kotayq	7,93	6
Armavir	8, 06	7
Gegharquniq	8,49	8
Lori	9,27	9
Shirak	9,57	10

To interpret the results, it is necessary to observe the weights of partial integrated rates at the third level as well as the normalized weights of posteriori indices. As presented in Table 2, the weight of the third-level private integrated index of "Infrastructure" is greater, than the weight of the "Population Wealth and Income" index. Among the characteristics of the third level of well-being of the population, the most prominent are: the population with low income below the standard of life or the extremely poor, the security of housing stock, as well as the share of emergency housing in the total housing stock. The latest once more shows that although it has been longer than 30 years since the earthquake, but the housing stock problem in the regions is still actual (the index of the total housing stock per resident is low, and the share of dilapidated housing is high).

[1]"Quality-of-Life Index model mathematical algorithm", V. Baghdasaryan, A. Aslanyan's "Methodology for building an Integral Quality-of-Life Index to determine the socio-economic growth issues of the Region". Scientific paper, Vanadzor State University, Yerevan, 2021, Vol. A, page 201.

Table 2. Weights of the third level partial integral indicators and Indicators of "Population Welfare" category

	Weight $\widehat{w}_k$	Indicator	Weight $l_{j,k}$
Wealth of the popu-lation and incomes	0,319	GDP per capita of the region	0,37
		Purchasing power of the average per capita income according to the CPI	0,08
		The share of low-income population or extremely poor	0,52
		The ratio of income to richest 20% & poorest 20%	0,03
Infra-structure	0,681	Share of per capita with the total area of housing stock	0,5
		The share of emergency housing in the housing stock	0,5

Fifteen posteriori indicators have been considered for studying of the population quality category of the Integral Quality of Life Index.

1. Natural increase percentage per 1000 population
2. The number of people with disabilities per 1000 population
3. Life expectancy from birth
4. The registered birth defect cases per 1000 population
5. Child mortality rate per 1,000 (born alive)
6. Number of HIV-positive patients
7. Mortality rate from neoplasms per 100 000 population
8. Mortality rate from blood circulatory system diseases per 100 000 population
9. Mortality rate from infectious and parasitic diseases per 100 000 population
10. Mortality rate from respiratory diseases per 100 000 population
11. Mortality rate from diseases of the digestive system per 100 000 population
12. Mortality rate from accidents, injuries and poisonings per 100 000 population
13. Share of university graduates among those engaged in the economy
14. Workforce productivity
15. Share of students with secondary education and high education within the population of the region

The RA regions rating by "Population Quality" category is presented in table 3.

Table 3. Integral Quality of Life Index by "Quality of Population" category

RA region	The Integral Quality of Life Index	Position
Ararat	3,7	1
Armavir	4,35	2
Gegharquniq	4,45	3
Syuniq	5,28	4
Tavush	5,58	5
Aragatsotn	6,06	6
Shirak	7,09	7
Kotayk	7,6	8
Lori	8,09	9
Vayots Dzor	8,21	10

Studying partial integrated rates at the third level (table 4) we can point out that "Health" subcategory has a greater impact, and its impact has also been aggravated by the increase in the number of Covid-19 mortality rates in 2020. There are significant differences within special characteristics that is, posteriori indicators have different contributions to the calculations of the integrated index.

Table 4. Weights of the third level partial integral indicators and eights of the indicators of the "Population Quality" category

	Weight $\tilde{w}_k$	Indicator	Weight $l_{j,k}$
Natural growth, defects, disability	0,118	Natural increase percentage per 1000 population	0,218
		Number of people with disabilities per 1000 population	0,128
		Life expectancy duration since birth	0,009
		Registered cases of birth defects per 1000 population	0,314
		Child mortality rate per 1000 born alive	0,085
		Number of HIV-positive patients	0,246
Health	0,629	The mortality rate from neoplasms per 100,000 population	0,523
		The mortality rate blood circulatory system diseases per 100,000	0,086
		The mortality rate from infectious & parasitic diseases per 100,000	0,056
		Mortality rate from respiratory disease per 100,000 population	0,042
		Mortality rate from diseases of the digestive system per 100,000	0,081
		Number of deaths from accidents, injuries, poisonings per 100,000	0,212
Education	0,253	Share of university graduates among those engaged in the economy	0,235
		Workforce productivity	0,531
		Share of students with secondary education and high education within the population of the region	0,234

To study the quality of the social sector, we divided the six indicators of the category into two groups: unemployment-migration, working conditions and crime.

Table 5. Results of integral quality of life indicator calculations for "Social sector quality" category

RA region	The Integral Quality of Life Index	Position
Gegharquniq	3,16	1
Aragatsotn	3,96	2
Syuniq	4,01	3
VayotsDzor	4,15	4
Ararat	7,19	5
Armavir	7,23	6
Shirak	7,81	7
Tavush	8,09	8
Lori	8,65	9
Kotayq	8,89	10

As of the results of the integrated quality of life index calculation, the weights of partial integrated indicators at level third are quite close by numerical values, but the unemployment-migration subcategory has a greater weight (chart 6). In the unemployment-migration subcategory, the weights are almost equal. The weight of the growth rate

of migration exceeds the weight of the unemployment rate by 0,08.In working condition and crime categories, the main share has registered crime number by 0.94.

The crime index is the biggest in the third level partial integrated index weight. that have a lot of transparent value, respectively, migration and unemployment rates. The next two indicators, which have a large derivative value, are the migration and unemployment rates, respectively. The migration index is a serious problem for all regions of Armenia.As for unemployment, it's certainly more than permissible value (natural level) and leads to many social problems, from high levels of crime to a myriad of social pathologies. Even, it can be claimed that unemployment is also the main reason for the high rate of migration in the regions.That's what determines the priority of solving the problem of unemployment.

Table 6. The weights of the third level partial integral indicators and the weights of the category "Quality of the social sector"

		Indicator	Weight $l_{j,k}$
Unem-ployment Migration	0,511	The growth rate of migration	0,54
		Level of unemployment	0,46
Workingcon-ditions,Crime	0,489	The share of employees engaged in hazardous working conditions in the average annual number of employees employed in the economy	0,03
		Death outcome or loss of working capabilities	0,03
		Number of recorded crime	0,94

Scientific novelty. The author proposes a mechanism for determining the socio-economic development problems of the region, based on the significance and problematic nature of the factors affecting the quality of life of the population

Conclusion. Research reveals that Lori regionis in the most complex positionaccording to the integral indicator of quality of life, in the Republic of Armenia (the only region with all rankings to occupy the final position).The situation is difficult in Shirak, Tavush, and Kotayk regions, which require additional strategic management efforts.

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Classification of the regions of the Republic of Armenia on the issues of strategic management

Key words: quality-of-life, integral indicator, socio-economic development, unemployment, migration

The purpose of this article is to assess the regions of the Republic of Armenia in terms of quality of life and to identify the main problems. To achieve this goal, the concept of an integrated quality-of-life indicator was used. The integral life quality index is a hierarchical system of interrelated indicators that allows to assessthe quality of life of the population based on publicly available statistical information on the values of three integral indicators: the quality of the population, the level of well-being of the population, the quality of the social sphere. As a result, the regions were classified into three categories: the level of well-being of the population, the quality of the population, and the quality of the social sector. Among the characteristics of the level of well-being of the population, the largest share is distinguished: the numberof the population living below the standard of living or extremely poor, the availability of housing stock, as well as the share of emergency housing in the total housing stock. Thehealth sub-category has the largest impact on the population quality category, the latter's influence severed by the increasing number of deaths from Covid-19 in 2020. Studying “Social Quality” category it proved that migration and unemployment remain serious problems in all regions of Armenia.For the general classification of regions, migration, unemployment and poverty are problems for all the regions of Armenia, but they are prominent in Lori, Shirak, Tavush and Kotayk regions.

ECONOMIC IMPACT OF DEVELOPING OF WEB TECHNOLOGIES

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Key words: developments, web-technologies, modern technologies, internet

Introduction. Today, there is a high rate of accumulation of scientific knowledge in all spheres of life, new technologies are being actively invented and old ones are being finalized. This trend has not bypassed the methods of developing all kinds of applications. Every year, new libraries, frameworks, and even entire programming languages are developed, and the methods used by programmers become obsolete five to ten years ago.

The first web pages on the Internet were static and had long loading times. The modern Internet is no longer limited to these kinds of web pages. The World Wide Web has shifted towards active user engagement as well as enhanced functionality through visually pleasing and powerful web applications. This article will discuss what is the architecture of web applications, its components, models, types.

Economic significance. In several large and developed countries, the Internet has a strong influence on economic growth rates. The Internet accounts for an average of 3.4 percent of GDP in large countries that account for 70 percent of global GDP. Internet use also has a positive long-term impact on economic growth. However, the use of the Internet needs to be made more efficient if it is to have a significant impact on a country's economic growth. Although the results of the study cannot be generalized because the study is based on a small sample due to the lack of time series data for some variables, the study opens new possibilities for other researchers as this study has important implications for future research study.

Literature review. Web application architecture is a model of interaction between the components of a web application, which are divided into two categories: user interface application components and structural components. How this interaction is planned determines the stability, performance, and security of the future web application. Web applications of different sizes and levels of complexity follow the same architectural principle, but the details may differ (Robin Nixon, 2019).

UI Application Components are links to web pages that do UI work, not development work, and therefore deal with display information panels, configuration settings, notifications, logs, and so on. These components have nothing to do with how the web application architecture works. Structural components of a web application refer to the functionality of a web application that the user interacts with. The two main structu-

ral components of a web application are the client side and the server side. The client component allows users to interact with web application features and is developed using HTML, CSS, and JavaScript. The server component includes a web application control center and a database necessary for storing information. Developed with Python, PHP, Java, NET, Ruby and other languages (Robert H'obbes, 2020).

Methodology. There are three web application development models that differ in the number of servers and databases required for a web application. This number depends on the complexity of the web application.

A feature of the "one web server and one database" model is that it uses only one server and only one database. This makes the model the most unreliable of all. If there is a problem with the server, the web application will not work. This model is not commonly used to build web applications. Nevertheless, the model is sufficient, workable for testing and closed sessions.

The "multiple web servers with one database" model is more reliable because there is a redundant server. However, if something happens to the database, the application will crash. Therefore, it is very important to ensure the security and continuous operation of the database. After one server fails, requests will be automatically redirected to a backup server, allowing the web application to continue working (Freeman A, 2019). The "multiple web servers and multiple databases" model is considered the best model for web application components because both web servers and databases have multiple replacements. You can store the same data in all available databases or evenly distribute them among themselves. However, if data is distributed, it may happen that some of it becomes inaccessible if this database fails. If the scale of the web application is large, then more than five web servers and databases are used, for which it is recommended to install load balancers. With its ability to manage and process large amounts of data, this model is a solid foundation for enterprise web application architecture.

Analysis. The type of web application architecture depends on how the application logic is distributed between the client and server sides. There are several types of web application architecture, each with its own pros and cons and serving different purposes.

Single Page Applications (SPAs) provide dynamic interaction by providing updated content to the current page, rather than downloading entirely new pages from the server each time to perform user actions. In other words, SPA provides access to all information from one HTML page. By moving the application logic to the client side and using the server side only as a data store, developers can speed up the site and lighten the load on the server. AJAX is the foundation for making pages connect and SPAs work (Cosen K, 2018). Microservices are small and lightweight services that perform a single functionality. Components of this type do not directly depend on each other. As such, they do not have to be built using the same programming language. This improves productivity and speeds up the development process.

Another type is serverless architecture. To create such a web application, developpers contact a third-party cloud infrastructure service provider for server outsourcing as well as infrastructure management. The benefit of this approach is that it allows applications to execute code logic without having to bother with infrastructure-related tasks. The serverless architecture is best suited when the development company does not want to manage or maintain the servers as well as the hardware for which they have developed the web application (Haverbeke M, 2019).

One of the major trends in web application development in recent years is the type of progressive web applications. The increase in smartphone usage has created a need to develop web applications capable of supporting mobile visibility. This type supports most modern web browsers and provides strong offline support with improved cache management. Most importantly, Progressive Web Apps can reach a very wide audience.

Web application architecture, like the Internet, is constantly evolving. Modern web application development has replaced outdated frameworks and core components. When building an application, choosing the right architecture is critical. Important parameters depend on this choice - the speed of the web application, reliability and security, as well as how it responds. The ideal web application architecture should enable efficient and easy development and maintenance of web applications (HUMED. A, 2017).

The history of the web industry development started from a very first site called "info.cern.ch" was created in 1990 by Tim Berners-Lee (Al-Tibbi W.H., 2019). The British scientist had laid the foundation for Web technologies by presenting the latest information transfer technology at that time – WoldWideWeb. He had developed the principles for the functioning and the installation of browsers and servers. In addition, Tim Berners-Lee had invented the technical means – the HTTP data transfer protocol, the HTML hypertext markup language, the URL system of web addresses. Later, HTML got support for 16 colors, the ability to insert images, and present information in the form of HTML tables. This was followed by the emergence of the first browsers to support these features: Mosaic in 1993, NetScape in 1994. However, due to the use of only HTML features in website development, work at that time was carried out mainly in primitive text editors.

In 1995, HTML was supplemented with Javascript, which allowed developers to add pop-up windows and other reactions to user actions on their sites. In the same year, the PHP scripting language (Personal Home Page) appears, which simplifies the creation of basic pages with scripting. A big step in the development of sites was the release of the FrontPage HTML editor, which works on the principle of WYSIWYG (What You SeeIs What You Get) and allows anyone to create their own website at home. The best connection of this editor was made with the Windows browser - Internet Explorer, released in the same year (Votinov M.V., 2017). The following year, 1996, the development of the web industry did not stop and was marked by two high-profile debuts - CSS

and Macromedia Flash (currently Adobe Flash). Thanks to CSS, working with styles during website development has become more convenient and systematized, and Flash has become the main means of creating animation for many years. By 1997, web development began to overtake the technical capabilities of that time, so the main event of the year was the announcement of HTML 4, which heavily used CSS style sheets. In addition, Macromedia released Dreamweaver as an alternative to FrontPage. In 1998, CSS2 was released, which enabled developers to use block formatting, work with sound, create styles on a page-by-page basis, and generate site content. It is worth noting that this version of CSS is still used to create websites, but not as actively as the later released CSS3.

After several quiet years in the web industry, in 2003 a new stage in website building began. This year, Facebook and MySpace were launched, which introduced a new trend in website design. Simplicity and functionality came to the fore during development, Flash animation became an almost mandatory element on every site, which required any developer to have the skills to work with it. In the same year, the release of WordPress took place, which simplified the creation of not only blogs, but also quite complex news resources. By 2005, the web industry was already actively using the capabilities of 2D and 3D applications, so a new development tool was released - Unity, which is necessary for creating browser games and introducing 2D and 3D to the site. We can also note another competitor to WordPress and Drupal, introduced this year - CMS Joomla! In 2006, a CSS-based metalanguage, Sass, was released, designed to increase the abstraction level of CSS code and simplify cascading style sheet files. It is still supported. Since 2007, web design has changed its course towards mobile devices, because it was in that year that the iPhone 1 and the Safari mobile browser were introduced to the general public. By 2008, web designers were starting to get used to the need to work for different screen sizes, so grids came into vogue in development, and later there were dedicated CSS frameworks that standardized and made it easier to work with individual elements. Influenced by Sass, Alexis Celier creates his own style language LESS in Ruby. Many novice developers are quickly becoming interested in the language because of its simplicity and versatility, and, most importantly, because of the ability to work with the TwitterBootstrap framework.

Over time, the web industry sets certain standards. Firstly, a good site must be adaptive, that is, the site must have several versions of adjustment to the screen of a user who visits Internet pages not only from a PC, but also from phones and tablets. Secondly, after Microsoft began to produce products designed in a flat metro style, flat design, or, in other words, flat design, became popular. Such a design helped web designers not only create concise and beautiful sites, but also make them adaptive through vector graphics and reducing the number of elements. But not everyone agreed with the trend towards simplification in web development, so parallax design appeared as an

alternative, which created a 3D effect on the site using different speeds of movement of the site elements when scrolling. In 2014, a new version of the HTML 5 language standard was published, which simplified the work with sound and audio. This ended the use of Adobe Flash, which was discontinued in 2021. It is worth noting that it also became possible to store data locally in users' browsers and fully manage the visit history, work with geolocation information and databases became available.

Currently, the development of flat design ideas, minimalism, parallax effects, and a primary focus on usability continues. Summarized information on the development of website development technologies is presented in table 1.

Table 1. Development of website development technologies

Years	Priority Development Tools	Basic development tools	Design Features
1990-1994	HTML	Text editor	Using the maximum possibilities of web design, different text and background colors
1995	HTML 3.0. JavaScript, PHP	Text editor, FrontPage	
1996	HTML 3.0. JavaScript, PHP, CSS, Macromedia Flash		
1997	HTML4. JavaScript, PHP. CSS, Macromedia Flash	Text editor, FrontPage. Dreamweaver	
1998	HTML4. JavaScript, PHP. CSS2, Macromedia Flash		
2000-2005		Text editor. FrontPage. Dreamweaver. WordPress, Drupal	Focus on simplicity and functionality, the presence of flash-animation
2005-2006	HTML4. JavaScript, PHP. CSS2, Adobe Flash	Text editor. FrontPage. Dreamweaver. WordPress, Drupal, Unity, CMS Joomla!, Saas	Focus on simplicity and functionality, the presence of flash-animation. Implementing Responsiveness
2007	HTML4, JavaScript, PHP. CSS2, Adobe Flash. Less	Текстовый редактор, FrontPage. Dreamweaver. WordPress, Drupal, Unity, CMS Joomla!, Saas, фреймворки CSS	
2010-2013	HTML4, JavaScript, PHP. CSS2, Adobe Flash. Less	Text editor, FrontPage. Dreamweaver. WordPress, Drupal, Unity, CMS Joomla!, Saas, frameworks of CSS, JavaScnpt-frameworks	Focus on adaptability, flat design, use of parallax design
2014-2021	HTML4, JavaScript, PHP. CSS2, Adobe Flash. Less	Text editor, FrontPage. Dreamweaver. WordPress, Drupal, Unity, CMS Joomla!, Saas, frameworks of CSS, JavaScnpt-frameworks, block website builders	Focus on adaptability, flat design, use of parallax design

Scientific novelty. Currently there is a huge amount of increase of information technology usage. It plays a significance role on any type of enterprise. Basically, any type of business can be implemented by electronic commerce. Today, corporate and industry web portals are not a static set of informative data but are full-fledged collaboration tools for many users around the world. E-commerce provides the right climate for the increase of production and efficiency by supporting the computer and software industries, the technological industry, and other associated industries, such as electronic storage media, networks, and communications, which are the infrastructure for e-commerce.Various studies and research papers indicate that the development of electronic commerce is positively correlated with an increase in GDP and Net Exports. A research paper done by Sixun Liu used the time series data to construct the regression equation and measure the correlation between Log GDP growth and increase in ECommerce, controlling for other variables. The results have shown a 5% statistical significance and according to the OLS regression there is a causal effect capturing the increase in GDP. Charts 1, 2 represent the growth of GDP and Net-Export of Armenia during the years when internet and e-commerce is being used more and more.

Chart 1. GDP & Internet Users in Armenia per year

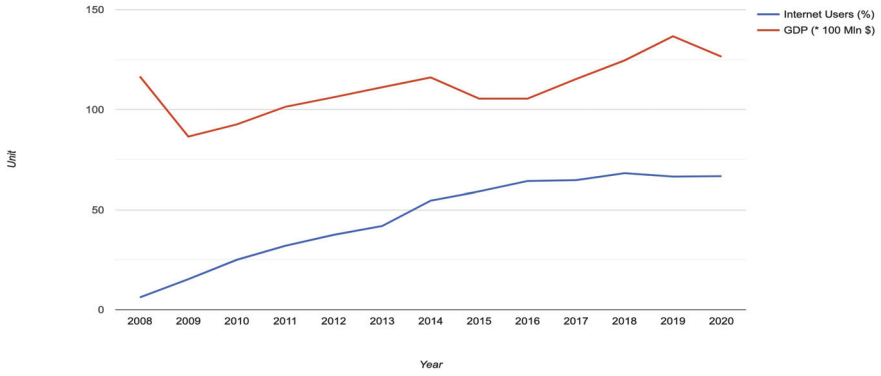
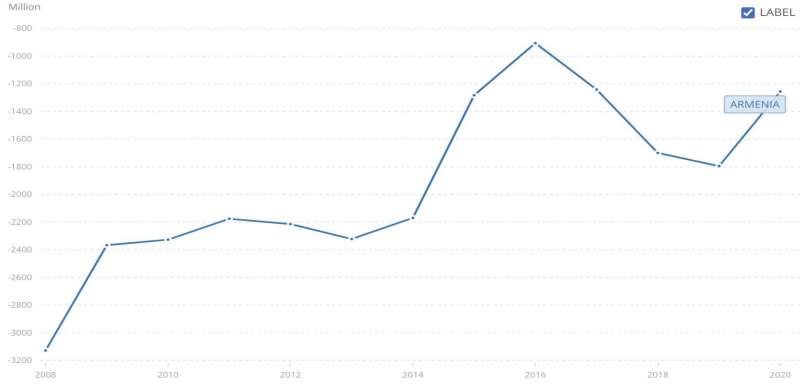


Chart 2. Net Export history in Armenia



Conclusions. More than 30 years have passed since the creation of the first site, over the years the web industry has come a long way from one-page simple sites written only using HTML to multi-page complex sites that integrate not only audio and video, but also 3D capabilities. All this became possible only thanks to the intensive development of web site development technologies. In the 21st century, the Internet industry is thriving. Organizations that use the Internet in business, namely, to sell their goods or services, interact with consumers and suppliers, grow faster economically, increasing their production potential. The growth of organizations promotes GDP. About 10 years ago China accounted for less than one percent of the global e-commerce market; today its share is 42%. Since Chinese industry is one of the leaders all over the world, the impact of e-commerce is strongly visible. This is a good example of E-commerce impact on economy as well.

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Economic impact of developing of WEB technologies

Key words: developments, web-technologies, modern technologies, internet

Since the variety of technologies in 2022 is unusually large, for each developer the question arises of determining the priority direction in work. The relevance of this article is due to this need. Thus, the main purpose of this work is to consider the development of Web technologies and the industry. The article discusses a common area, in 2022, the web, since modern information technologies largely affect the daily life of any person. IT is used to create electronic markets by transferring all payments made to the information sphere, where payments can be tracked and controlled. Also, the development of information technology affects the creation of additional jobs and the retraining of existing personnel, which is directly related to the reduction of unemployment, information technology has expanded opportunities in the medical, educational, law enforcement fields, which has improved the activities of each institution. This topic became popular also since the development of web technologies, the range of professions related to the development of websites is expanding, while studying computer science and information technology in this area, the article provides a history of the development of the web industry and the stages of transformation web technologies.

INFORMATION TECHNOLOGIES AND DEVELOPING A SINGLE PAGE WEB APPLICATION USING THE REACT LIBRARY

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Key words: single-page application, JavaScript, ReactJS, SPA, Frontend, architecture, modularity, component, HTML, DOM, resource saving

Introduction. Together with the increase in the number of such systems in the corporate infrastructure, the question of choosing software products for the implementation of an effective, modern and fault-tolerant system is being raised. Therefore, Single Page Application (hereinafter referred to as SPA) gained popularity.

SPA applications are web applications that use an HTML document as a shell for all web pages and organize the exchange of information with the user through dynamically loaded HTML, CSS, JavaScript.

The aim of the work is to analyze the existing frameworks for creating web applications, determine their features, pros and cons according to various characteristics, and choose the appropriate framework for implementing the client side of the application. Of course, optimizing the developer's work is a requirement.

Economic significance. Digital technologies affect the structure of trade by increasing the service component, stimulating trade in certain commodities such as urgent goods, changing patterns of comparative advantage, and influencing the complexity and length of global value chains. E-commerce is the activity of electronically buying or selling goods through online services or over the internet. E-commerce affects economic variables and growth rates. This results in higher wages, a higher standard of living for the people, the structuring of markets and the expansion of marketing, increased sales and exports and thus increased production and growth rates. React is an excellent JavaScript framework for building an E-commerce web application.

Methodology and literature review. The main SPA-architecture is the view (View) - it is with this that the user of the system interacts. Often views are based around templates (Template) - blanks that are converted into HTML. To store information, you need a model (Model). A model is a set of data and functions required to work with events and data. All model information is fully stored in memory (Storage). To maintain the integrity of the information, the view tracks any changes to the data in the model. Similarly, the model responds to the presentation notification and provides continuous interaction between the WEB service and the server, executing requests for information

transfer (including using REST) [Klochkov, 2018, 1-5; Results for js web frameworks benchmark, 2020].

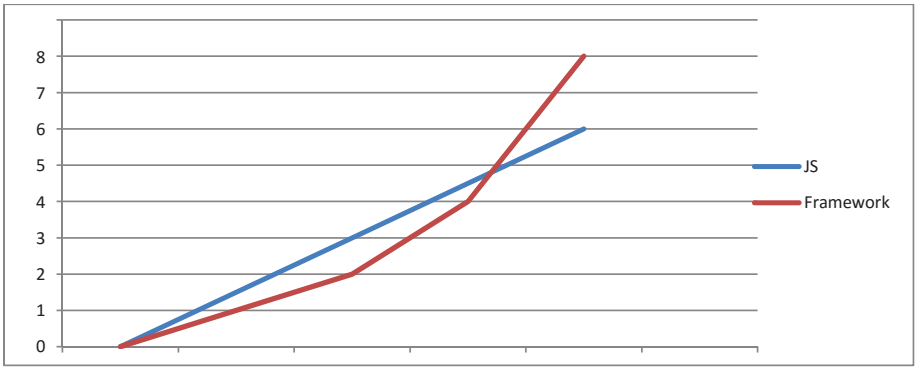
A feature of the implementation of SPA is a modular structure. This is necessary in order to simplify refactoring and testing, as well as improve and simplify the maintenance of the application. Modular architecture means dividing the application into separate packages with explicit dependencies. Each package is a file and a module [Results for js web frameworks benchmark, 2020]. In the beginning - using this architecture may feel like a slowdown but creating and having compact elements increases the expected performance, and a large project will be clean and easily changeable.

JavaScript is the language of the World Wide Web. It originally was a tool for managing certain types of web page elements (such as images and form fields), but the language has evolved rapidly since then. Now, in addition to creating client-side scripts executed by the browser, JavaScript is used to develop cross-platform programs [Suvrova, Gavrilenko, 2018]. JavaScript is included in the list of the main modern technologies that web programmers need to know and be able to use HTML (markup language), CSS (style language) and the JavaScript programming language that determines the behavior of web pages [Potapov, 2014].

The ReactJS JavaScript library is used to implement the client side of the program. ReactJS is a powerful tool for implementing user interfaces. The purpose of this tool is to provide ease and scalability of the application, ensuring the display of all that is characteristic of web pages at high speed [Bondarenko, 2018, p. 46-48].

React and Angular are libraries and, depending on the requirements, the use of each of them makes it possible to create dynamic web applications in a short time. Obviously, good architecture with core-js, especially high-quality code, requires more experience and more time. As an example we may assume that 10 students are tasked with doing form manipulation with a framework and pure-js for comparison.

Chart 1. The results of time management



Thus, we spent a little more time at the start and gained a lot of time in the follo-wing tasks. React allows developers to model the state of interfaces and describe them

declaratively. React is just JavaScript, the library has a very small API to learn, just a few functions and how to use them, which allows you to quickly learn it [Suvrova, Gavrilenko, 2018].

Table 1. Difference between modular and non-modular applications

Non-modular application	***Modular application***
Each piece of code is global	Packages provide a single public interface
Variables are global	Local variables in each package
Load order matters because anything can overwrite or change something	The order of loading does not matter thanks to the division into packages
Implicit dependencies on something global	Implementation details not available outside the package
Files and modules have no connection in meaning	Each file corresponds to one module
	Explicitly Declared Dependencies

Basic concepts. Elements are JavaScript objects that represent HTML elements. Components are React elements designed by the application programmer. They are often parts of the user interface that contain functionality and structure. React makes building interfaces much easier thanks to components. JSX is a method for implementing React elements and components. For example, this is a React element written in JSX: <h1> Hello World </h1>. The implementation of a similar element is also possible in Java-Script: ReactDOM.h1(null, 'Hello World'); JSX requires much less effort, it is converted to Java-Script before running in the browser.

Table 2. Performance Comparison

Nomination	angular-v4.1.2-keyed	react-v 15.5.4-mobX-v3.1.9	vue-v2.3.3-keyed
Create lines. Duration to create 1000 rows after page load.	193.17.9 (1.2)	243.99.4 (1.5)	166.78.6 (1.0)
Replace all lines. The duration of updating all 1000 rows of the table (with 5 warm-up iterations)	197.45.3 (1.2)	229.212.2 (1.4)	168.55.0 (1.0)
Partial update. Time to update the text every 10th line (with 5 warm-up iterations)	13.04.5 (1.0)	16.01.8 (1.0)	17.32.9 (1.1)
Select a line. Row selection duration in response to a row click (with 5 warmup iterations)	3.42.3 (1.0)	10.13.8 (1.0)	9.31.7 (1.0)
Change lines. Time to swap 2 rows in 1K table (with 5 warm up iterations)	13.41.0 (1.0)	18.01.2 (1.1)	18.31.5 (1.1)
Delete line. Row deletion duration (with 5 warmup iterations)	46.13.2 (1.0)	53.72.1 (1.2)	52.62.7 (1.1)
Create many lines. Creation time 10,000 rows	1946.041.8 (1.2)	2217.371.5 (1.4)	1587.533.9 (1.0)
Add rows to a large table. Time to add 1000 rows to a 10,000 row table	324.610.1 (1.0)	459.847.2 (1.4)	399.511.0 (1.2)
Clear lines. Cleanup duration for a table populated with 10,000 rows	379.911.3 (1.5)	495.128.8 (1.9)	254.55.0 (1.0)

In order to compare the performance an association is created between the domain data and the DOM element by assigning a "key". When the data changes, the DOM element with the corresponding key will be updated. Any change to an element in the data array causes a corresponding change in the DOM (Table 2) [Klochkov, 2018, p. 1-5]. Also, one of the key indicators is memory allocation (Table 3).

Analysis. Considering the pros and cons of React and Angular 5 in tables 4 and 5 [Karyshev, 2017, p. 47-54].

Table 3. Application memory usage

Nomination	angular-v4.1.2-keyed	react-v 15.5.4-mobX-v3.1.9	vue-v2.3.3-keyed
Memory usage after page load	4.80.0 (1.3)	5.40.1 (1.4)	3.80.0 (1.0)
Memory usage after adding 1000 rows	10.90.1 (1.4)	14.30.1 (1.9)	7.50.1 (1.0)

Table 4. Pros of Angular 5 and React

Angular 5	React
Modern features, improved RXJS, faster compilation, HttpClient launch	Easier to learn due to its simplicity in terms of syntax. No need to learn TypeScript in depth compared to Angular
Accessible documentation providing up-to-date information	Maximum flexibility and responsiveness
Bidirectional data binding. This reduces the risk of potential errors.	A virtual DOM that allows documents in HTML, XHTML, or XML format to be arranged into a tree that web browsers better match when parsing various elements of a web application
MVVM (Model-View-ViewvModel), allows programmers to develop the same section of a software product at the same time using the same set of data	In combination with ES6 / 7 ReactJS, the system can work under high load
Component dependency injection related to modules and modularity in general	Downward data binding, which means that with this type of data flow, child elements cannot affect parent data
Rather complex syntax, based on the first version of Angular	There is no easily accessible documentation as ReactJS was developed very quickly
Problems may occur when migrating from an older version to a newer one	Long learning time. React JS requires deep knowledge of how to use the ICC framework

Table 5. Cons of Angular 5 and React

Angular 5	React
Rather complex syntax, based on the first version of Angular	There is no easily accessible documentation as ReactJS was developed very quickly
Problems may occur when migrating from an older version to a newer one	Long learning time. React JS requires deep knowledge of how to use the MVC framework

Scientific novelty. Information technology does not stand still, there are constant changes that affect everything that surrounds us, including web resources. The IT revolution is an important part of the development of any type of enterprise. Regardless of the type and field of activity, the system of Internet technologies, in 2022, has enough opportunities to implement almost any business. Today, corporate and industry web portals are not a static set of informative data but are full-fledged collaboration tools for many users around the world. It is becoming more and more difficult to figure out which software systems do not have (or will not have) this very Internet interface in the coming years, programs become websites, and site building, and actual application programming become indistinguishable.

E-commerce affects economic variables and growth rates. It leads to higher wages, higher standards of living for individuals, structuring markets and expanding marketing, increasing sales and exports, and thus increasing production and growth rates. The use of modern technological means of trade by states increases the strength of its economy and its growth, and this is beneficial to the social, health, and education sectors, because of the use of modern technological means in the dealings, and under electronic commerce, it is possible to develop production in accordance with its electronic nature, which increases sales and increases corporate profits.

Conclusions. Based on the comparison of the performance of AngularJS and React, we can conclude that React (framework from Facebook) is not inferior to AngularJS (framework by Google) in terms of the speed of performing operations with DOM nodes, and the main difference lies in the application architecture. AngularJS is an implementation of the MVVM pattern, while React puts the View first, its main purpose is to render data, and it leaves the rest of the components up to the developer. By virtue of this approach, it is quite possible to combine AngularJS and React in one application to improve the performance of problematic components. And with a simple example, we saw that the correct use of the framework is saving time and resources, which is one of the most important things in the economy. In summary Angular has more strict structure, which allows to develop thinking about it less, meanwhile React has more dynamic structure, but should be caried out carefully.

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Information technologies and developing a single page WEB application using the react library

Key words: single-page application, JavaScript, ReactJS, SPA, Frontend, architecture, modularity, component, HTML, DOM, resource saving

At present, the Internet has firmly entered the life of almost every person, has become an integral environment for supporting business processes. Every year technologies develop, and there is a need for web applications that have a fast response to actions in the user interface and work perfectly on all devices (both stationary and mobile). The article discusses the development of the architecture of the client side of a single-page application, its features and implementation using the modern React JavaScript library, and a comparative analysis of the use and performance of libraries for developing the client side of React and AngularJS applications. Also, why would using one of these be more cost effective for a development company than using core-js. Ecommerce has increased trade in services between countries. The sector accounts for 60% of the world's total production. With the advent of modern ICTs, e-commerce facilitates the process of bringing consumers and producers closer together and eliminating geographic distance. The use of e-commerce will eliminate traditional jobs and replace them with new skills, requiring workers to be trained in the use of technology so they can compete and win jobs. This means that e-commerce has a negative impact on manual and unskilled labor, but has a positive impact on technically trained workers who can easily find jobs and help create positions and disciplines that were previously not needed or known.

BUBBLES IN MODELS WITH ASSUMPTION OF THE FINANCIAL ACCELERATOR

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Key words: monetary policy, financial accelerator, transmission mechanism, asset bubbles, financial crisis

Introduction. There are a lot of papers in the academic literature which study the effects of asset bubbles on different parts of the real economy. However, the ways how asset price volatility affects real macro-variables are not trivial and need to be studied. First of all, referring to the role of bubbles in the redistribution of capital in the economy, it is worth noting that the unreasonable growth expectations of the latter in some sectors of the economy can lead to inefficient distribution of resources in the economy. Financial resources can be used for capital investment in industries where growth opportunities are greatly exaggerated. Existing bubbles in some stock prices encourage firms to issue more shares, and the derived growth expectations are forcing investors to divert money to those industries. Such a process is very important, as some directions of the flow of these new financial resources may affect the opportunities for further development of the economy and the unemployment rate as well. In this sense, misallocation of capital can have a long-term effect on economic growth. The impact of asset price bubbles on the real economy is becoming larger in scale due to the imperfections in the financial markets and financial frictions. In this context, the problem was examined by Bernanke and Gertler [Bernanke, Gertler 1999, p. 20]. In their paper, the authors consider the so-called "balance sheet channel" as the main quan-titative explanation for the interrelationship between asset price bubbles and real macro-economic variables, the essence of which is as follows: based on the assumption of the existence of financial frictions and consequently information asymmetries in the credit markets, financial intermediaries, as a response to certain costs of overcoming these asymmetries, prefer lending to companies with stronger financial position, as the latter may have a higher level of collateral, which will compensate the considered costs. In such a situation, the decrease in asset prices leads to an increase in the leverage ratio of the firm, constrains the credit access, which in turn leads to a decrease in capital invest-ment and, consequently, to a decrease in output. Thus, in the described circumstances, it can be said that the fall in asset prices affects both "aggregate demand" and "aggregate supply". The amplification and propagation of economic shocks with the presence of fi-nancial frictions, which follows the logic of the influence of information asymmetries in lending processes described above, have been examined by Bernanke, Gertler, and Gilchrist and have been called “financial accelerator” [Bernanke, Gertler, Gilchrist, 1998].

Methodology. The models used by regulators in different countries, to respond to asset price bubbles are considered as a scientific basis for the paper. In order to address this issue in the context of the financial accelerator model, the applications of the dynamic stochastic general equilibrium (DSGE) models have been considered.

In order to test for bubbles in the RA real estate market, we use statistical tests and Monte Carlo simulations. Within the framework of the policy analysis conducted by the Central Bank of the Republic of Armenia, the legal orders and decisions of the Central Bank of the Republic of Armenia were used as a basis.

Literature review. The observations discussed above lead to the following question: If fluctuations in asset prices could lead to real macroeconomic and financial instability, how should regulators respond to them?

Bernanke and Gertler [Bernanke, Gertler, 1999] raise the question of how central banks should respond to asset price bubbles in the context of a monetary policy interest rate rule strategy. Even though monetary policy is not the main tool used to respond to asset price spikes in the economy, history shows that collapses of asset price bubbles caused the economies the greatest damages at times when central banks have shown irresponsibility or, conversely, have adopted a policy of prematurely responding to the rise in asset prices. As a result, the question arises: what policy should the central bank adopt? Is it necessary to respond to asset price bubbles in the monetary policy rule? If so, how to distinguish the growth of asset prices due to the fundamentals of the economy from a bubble? At what stage should the regulator respond?

The authors present a dynamic general equilibrium model in their work, which includes the concept of financial accelerator and exogenous bubbles in asset prices (it is the extension of BGG [Bernanke, Gertler, Gilchrist, 1998] model with the assumption of asset bubbles). To introduce the idea of asset price bubble, the fundamental value of capital is defined as a sum of discounted dividends, the deviation from which will be considered as a bubble. Given by the following equation [Bernanke, Gertler, 1999, p.24]:

$$Q_t = E_t \sum_{i=0}^{\infty} [(1-\delta)^i D_{t+1+i} / \prod_{j=0}^{t} R^q_{t+1+j}] = E_t\{[D_{t+1} + (1-\delta)Q_{t+1}]/R^q_{t+1}\}$$

Where E_t indicates expectation, δ is the physical depreciation rate of capital, D_{t+i} are dividends and R^q_{t+1} is the discount rate.

For a bubble to exist, the S_t market value of capital may differ from the fundamental value Q_t. If there exists a bubble at time t, it persists with probability p and the growth equation is as follows:

$$S_{t+1} - Q_{t+1} = \frac{\alpha}{p}(S_t - Q_t)R^q_{t+1}$$

where $p < \alpha < 1$: If the bubble bursts with probability 1-p, then

$S_{t+1} \quad Q_{t+1} = 0$

In the extended model, the presence of bubbles affects the real economy through the income channel and through the impact that market values of assets have on companies' balance sheets. The authors view the response of central banks to asset price bubbles in the context of the monetary rule, in one case considering the simple version of the rule, when the interest rate is determined based on inflation expectations, and in the other case allowing the latter to respond also to the lag value of stock price fluctuations. Exogenous shock by one percentage point to the fundamental value of stock prices is considered a bubble in asset prices. In this case, authors consider the options of response and non-response to asset prices in the interest rate regulation by the central banks with 2 types of policies: accommodative (β=1.01) and aggressive (β=2) inflation targeting.

The results obtained by the authors show that if the monetary rule adopted by the central bank does not respond to asset price bubbles, then in the case of aggressive inflation targeting policy, the effect of the bubble (assumed to last for 5 periods) is mitigated. Despite the assumption that monetary policy does not respond directly to asset price bubbles, in the case of aggressive policies, there is awareness in the society that interest rates are quite sensitive to inflationary pressures arising from the increase in the asset prices (remember that flexible inflation targeting assumes high-level transparency from central banks), which leads to a reduction of asset price and inflation fluctuations.

If in the monetary policy rule interest rate responds to the asset price bubbles, then the policy, in this case, is also divided as accommodative -aggressive depending on the coefficient of response to the inflation expectations. The coefficient of response to asset price bubbles is considered constant 0.1. The results show that in the case of an accommodative policy, in the presence of a bubble, the expected increase in interest rates leads to a decrease in the fundamental value of assets, which, together with the expectations of future interest rate increases, counteracts the increase in the market prices of the assets, resulting in a decline in real output. The authors interpret this result as targeting incorrect variables by the central banks based on asset prices and not on the fundamentals of the economy. In the case of aggressive inflation targeting, the monetary rule reacts more to the expected inflation, specifying the inverse effect of the asset price response. As a result, it can be argued that in the case of a monetary rule, responding to asset prices, the expected inflation response should be aggressive rather than accommodative. Aggressive inflation targeting will only provoke a response to interest rates if the increasing prices lead to inflationary expectations, thus refraining central banks from the difficult question of distinguishing fundamentally rational growth in asset prices from a bubble. One of the advantages is the central bank's more transparent policy which, along with rising asset prices, will create public expectations that interest rates will rise, which by itself can be a tool to calm the public exuberance or, conversely, a way to curb panic.

The accelerator model of responding to asset price bubbles was a turning point in the modeling of the economy with financial rigidities. However, the model was modeled on the US economy, and the assessment of the reliability of the results for small open economies still needed to be examined. The mentioned problem considers Martha Lopez in the paper [Lopez, 2014]. The work considers the extension of the theory suggested by Bernanke and Gertler, with the assumption of a small open economy. The main purpose of the work is to find out whether the results of the model built with the assumption of a closed economy [Bernanke, Gertler, 1999] are still reliable in the case of a small open economy, as well as to perform a comparative analysis of impacts between the two types of economies. In addition to the discussions above, the author views the policy pursued by central banks in the context of responding to asset prices, taking into account both capital inflows and real exchange rate appreciation, which comes from the assumption of a small open economy.

The results of the open economy model show that the results obtained by Bernanke and Gertler in the closed economy model, were still relevant. In particular, the paper reaffirms the view that central banks should respond to inflation expectations, and should not respond to asset price bubbles, even more, in the small open economy model, if central banks respond to asset price bubbles with an accommodative monetary policy rule, then in the presence of an asset price bubble, real output declines more than in a closed economy model, which is since there are public expectations that the central bank will respond to rising asset prices, rising interest rates, which will lead to a bubble burst. Thus, the fundamental value of assets decreases, which together with the decrease in the real exchange rate leads to a lower market value of assets, hence due to the credit channel of accelerator mechanism, the subsequent decline in real output at a higher rate than in the case of an open economy. The obtained results allowed arguing that business cycles in small, open economies are deeper.

The issue of regulators' response to asset price bubbles has been addressed in the work by Robert Tetlow [Tetlow, 2005], who sought to extend Bernanke and Gertler's results by incorporating into the model adjustment costs in investments, consumption habits, and the impact of asset price fluctuations on entrepreneurs' investment decisions.

The results largely reaffirmed Bernanke and Gertler's assertion that the central banks' response to asset price bubbles should be based solely on inflation expectations; no separate asset price response is required. At the same time, given the uncertainties in measuring the fundamental value of asset prices, the authors suggest using a non-linear interest rate rule to enable regulators to respond to large asset price bubbles, the existence of which is not uncertain.

The suggestions made by Tetlow can be seen in the paper of Alexei Vasilenko from the Central Bank of Russia [Vasilenko, 2018], which, based on the work already presented by Bernanke and Gertler, presents a model based on the financial accelerator, which the author combined with a model of agent-based financial markets, allowing bubbles to exist in asset prices. The interest rate decisions of central banks are guided by Taylor's rule, which assumes that interest rates respond to asset price bubbles in a non-linear manner. Particularly, it is assumed that the central bank changes the interest rate to prevent a bubble when the ratio of the market value of capital to its fundamental value exceeds a predetermined threshold, which is considered as a parameter in the model. Otherwise, the standard Taylor rule is in use. The existence of a response threshold allows regulators to avoid tightening monetary policy during small fluctuations in asset prices, which may lead to a reduction in the real output level. On the other hand, the threshold refrains regulators from the recognition of the asset price bubble, as the monetary response occurs in case of sufficient deviation of asset prices from the fundamental value when the bubble is already visible.

The paper then looks at the behavior of the economy in the event of a shock to asset prices, in one case when the central bank raises interest rates in response to a bubble, in the other case not. The results show that the response of the central bank to the bubble reduces the level of output, inflation, as well as the level of fluctuations in social wealth in the context of the policy pursued by the Central Bank (as social wealth the authors consider the ratio of the difference between the actual and steady-state levels of the household utility function and the level of consumption at steady state). It is worth noting that the resulting model also includes an effective communication policy conducted by the central bank, which implies transparency, a clear public perception of the policy pursued by the policymaker. In the absence of an adequate level of communication policy, the central bank's policy effectiveness of responding to asset price bubbles suffers.

Eddie Gerba [Gerba, 2011] also considers the model of the influence of asset prices on entrepreneurs' investment decisions in his work. Based on the accelerator mechanism, the work re-examines the monetary policy with the assumption of asset price bubbles. In addition to previous research in which exogenous fluctuations in asset prices, affect the net worth of the entrepreneur, in the presented model entrepreneurs make investments based not on the fundamental value of capital, rather than the market value, which leads to the above-mentioned exogenous fluctuations' influence on entrepreneurs' investment decisions. To assess the effectiveness of monetary policy to asset price bubbles, the author examined welfare changes (measured by a change in the loss function that the government wants to minimize) when the monetary rule does not respond to asset bubbles but the bubble exists (type 1 error), and when the regulator recognizes a bubble and responds with the monetary rule, but it does not exist (type 2 error).

The obtained results are compared with the case when the regulator recognizes and responds to the bubble when it exists. The results showed that the monetary rule, which responds to asset prices, is preferable to one that ignores them.

Simon Gilchrist and Masashi Saito [Gilchrist, Saito, 2006] consider the problem of central banks' response to asset price bubbles by discussing the accuracy of the information that have the government and the society. To this end, the authors assume that asset prices in the economy reflect the growth rate of technology. In this case, the authors assume that asset prices influence entrepreneurs' investment decisions. The private sector and the government have uncertainties about the growth rate of technology, which they assimilate over time.

The authors argue that in the absence of financial rigidities, even in a situation where the private sector is unaware of the true rate of technological progress, monetary policy rule, that responds only to the expected inflation is sufficient. In the presence of financial rigidities, inflation targeting somewhat inhibits the impact of asset price volatility on real macroeconomic variables, however, real output deviations from potential are still observed in the economy. The authors, on the other hand, argue that the ability of central banks to respond to asset prices depends on the level of public and regulator's awareness of the real technological growth rate. The paper concludes that the response of the interest rate rule to asset prices is most effective when the private sector is uncertain about the real rate of technological progress and the regulator, on the contrary, is fully aware of it.

The study of bubbles observed in asset prices, in particular, in the real estate market, gained special importance after the financial crisis of 2007-2009. A large number of economists cited the unprecedented rise in prices in the US real estate market in the early 2000s as the cause of the crisis, which can already be called a bubble, which later exploded. At the same time, at the root of the crisis one can see the liberalization of the US financial sector, the gaps in securitization control mechanisms, as well as the many factors of public panic behavior that can be summarized as imperfections in financial and credit markets.

There are many academic and non-academic types of research about the reasons behind the crisis. Ben Bernanke, in his article (Bernanke, 2018) tries to answer the question about the reasons for the crisis that follow the imperfections of the credit markets. Don't we underestimate the effects of the crisis on the real sector? The author puts forward a theory that, despite the negative impact of the crisis on households, it would not be so profound if the financial sector had shown greater stability, and panic behavior would not have prevailed in the decisions made by individuals. Not ignoring the role of aggressive financial lending in the pre-crisis period (which led to a sharp rise in the households' balance sheets leverage ratio and a decline in their solvency in times of cri-

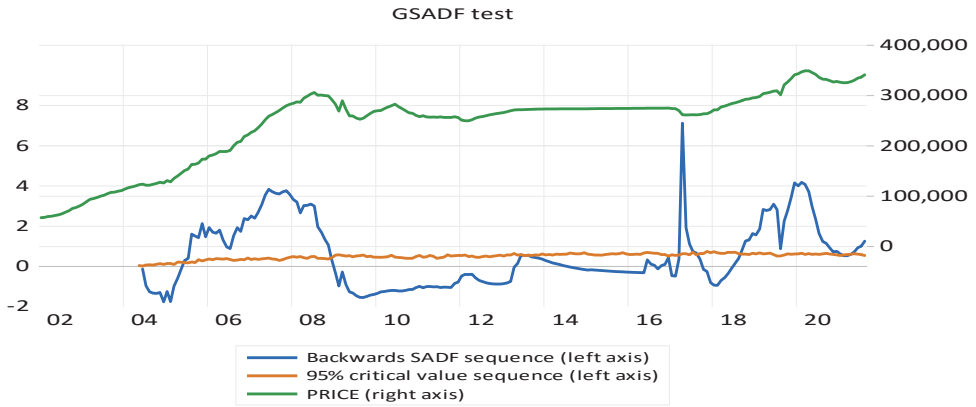
sis); the study, nevertheless, claims that the financial crisis got an irreversible volume because of the panic in the financial markets, which led to a reduction in credit supply, and further, with the financial accelerator effect, amplified and propagated the volume of negative shocks. However, the results of Bernanke's paper were not accepted unequivocally. In particular, Paul Krugman disagreed with the results, who in turn published a critical article [Krugman, 2018], in which he expressed the view that the main motive of the financial crisis of 2008 was the explosion of a bubble in the real estate market. The same reason stands for the long-term decline in real macroeconomic indicators, which lasted longer than the instability of the financial sector. Expressing distrust of Bernanke's VAR analysis, Krugman claims that he does not see the "transmission mechanism" by which financial sector imperfections will have such long-term effects on real macrovariables. Bernanke, in turn, published an analysis [Bernanke, 2018] in which, in response to Krugman's view, he presents the analysis of time series of macro variables, the chronology of which, according to the author, suggests that variables related to the real estate market accurately describe the state of the economy. However, after 2007, variables that characterize financial panic, such as non-mortgage credit yields, have become more explanatory. On the other hand, the author notes that only a decline in the real estate market a reduction in credit supply would naturally have an impact on credit-sensitive spending, but in the case of self-financing firms, which do not need lending to run their business properly, the behavior is explained more accurately by the panic in the financial market. The author states that he does not underestimate the role of the real estate price bubble in the financial crisis, even more, he considers it as a part of the financial accelerator mechanism, which led to the deterioration of household balance sheets. However, the worst effect of the bubble was the panic in the financial sector . Absence of panic combined with a higher level of stability of the financial sector would not have allowed the crisis to deepen so much.

Given the role of the real estate market in the global financial crisis, economists give a special significance to real estate prices and the proper ways for responding to them. A paper published by the economists of the Central Bank of the Netherland [Hessel, Peeters, 2011] also addresses the issue of regulators' response to the real estate bubbles. The authors, studying the real estate market developments in the economies of the Organization for Economic Cooperation and Development (OECD) and their impact on macroeconomic and financial variables, essentially share the view that monetary policy should not be considered as a primary tool for cyclical fluctuations in asset prices, giving priority to macroprudential policy. Macroprudential instruments, such as restrictions on the LTV ratios, have a more targeted effect on the problem, while a change in interest rates may have an impact on the wider economy, leading to undesirable consequences. Giving priority to macroprudential policy, the authors, however, acknowledge

that without the support of appropriate monetary policy, macroprudential policy is not sufficient to ensure financial stability in the country.

Testing for bubbles in the real estate market with the help of statistical tests. As we have already noted, for the central banks to respond accurately to the asset price bubbles, it is first necessary to recognize the bubble and separate it from the rational growth derived from the fundamentals.

The issue of recognizing bubbles has been in the focus of economists for many years, especially after the 2008 crisis. However, at the theoretical level, the problem of recognition is very difficult. First, it is difficult to determine the price of an asset derived from the fundamentals of the economy. Another way to identify bubbles is to use statistical tests. An example of such a test is the extended version of the right-tail unit root tests developed by Phillips, Wu, Yu [Phillips, Wu, Yu, 2012], which tests the non-stationary hypothesis of a time series of asset prices as being an explosive process. In addition to testing the hypothesis of the presence of a bubble component in the time series, these tests also estimate Monte Carlo simulations to generate critical values of test statistics, which are used to detect the beginning and end periods of the bubble. These tests have been widely used for the recognition of bubble periods in stock price indices [Phillips, Shi, Yu, 2013], as well as for the recognition of bubbles in the real estate market for the RA [Avetisyan, 2017(the analysis in the paper has been done as of 2017). In this paper, a more comprehensive version of the analysis is presented, covering the data period 2002-2021.



Graph 1. Real estate price bubble periods estimated for apartments located in Yerevan, GSADF test

Testing for asset price bubbles is primarily concerned with limiting companies' access to financial resources through the corporate balance sheet channel in the accelerator mechanism. Real estate, on the other hand, in the accelerator concept, acts as collateral for financial intermediaries for providing financial resources to firms, which

creates potential risks to the stability of the financial system in the event of a bubble. Graph 1 presents the analysis based on GSADF statistics for the recognition of bubble periods in housing prices in Yerevan. The values of the SADF statistics are compared with the critical values of the 95% confidence level of the SADF statistics, which were obtained with the help of Monte Carlo simulations with 100 replications.

We may conclude that the test recognized the period of the global crisis of 2008 (06 / 2005-11 / 2008) as the period of bubble, and the short period of 2017 (04 / 2017-08 / 2017). After 09/2018, the value of SADF statistics exceeds the critical value, returning to its critical value level in 11/2020, shortly after 06/2021, exceeding the critical value again. The letter may be due to the demand shock by the society, mainly conditioned by government decision about the gradual repeal of the law that allows mortgage borrowers to direct income tax amounts to repay mortgage interest. Thus, according to the GSADF method, the housing market in Yerevan was in the bubble period as of 08/2021.

Regarding the monetary rule applied by the Central Bank of Armenia, it should be noted that, according to the provided information [Central Bank, 2010], it does not contain a component that responds to asset prices. However, in 2021, the Central Bank began to use macroprudential instruments [Central Bank, 2021] (in particular, for the loans up to 300,000 drams were imposed restrictions on consumer credit scores and for the ratio of monthly payment/income). The restrictions mentioned above were aimed at controlling the risks conditioned by the growth of loan portfolios as of 2019.

Conclusion. The paper presented the channels, through which asset price bubbles have their influence on real macroeconomic variables, as well as their role in the context of amplifying macroeconomic shocks. The paper discusses the experience of different authors and central banks in responding to asset price bubbles. The mentioned results show that there is no unequivocal agreement on expediency and methods in response of bubbles by different regulators. However, models for responding to already visible balloons that exceed a certain threshold value are more widely used. Our analysis is a part of the financial sector impact assessment study on real macroeconomic variables in the context of the financial accelerator mechanism. The results of the analysis of Yerevan's real estate market during 2002-2021 show that the statistical tests in different periods, including 08/2021, are recognized as bubble periods.

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Ara AVETISYAN

The issues of monetary policy response to asset price bubbles in models with assumption of the financial accelerator

Key words: monetary policy, financial accelerator, transmission mechanism, asset bubbles, financial crisis

In economic modeling problems, asset prices are considered endogenous variables. Meanwhile, there are times when they do not reflect the true nature of the economy, that is, pricing is not based on the fundamentals. It is worth noting that such fluctuations in asset prices are not only the result of deviations from the fundamentals of the economy; but also have an impact on the economy, causing real economic instability. Such fluctuations in asset prices can be attributed to both the irrational (or so-called behavioral) characteristics of investors and the liberal policies pursued by regulators, which are characterized by increased access to credit and can lead to asset overvaluation. The paper aims to present possible ways in which asset price bubbles affect real macroeconomic variables, as well as the models used by regulators to respond to bubbles, emphasizing those based on the concept of a financial accelerator. The paper expands the results of the statistical test for the presence of bubbles in the real estate market in Yerevan and the approaches used by the Central Bank of RA to respond to asset price fluctuations.

ASSESSMENT OF FISCAL POLICY IMPACT ON INCOME INEQUALITY ELIMINATION AND POVERTY ALLEVIATION

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Keywords: Income inequality, poverty, taxes, budget, fiscal policy

Introduction. Political and public figures and international organizations in the last years attach much importance to issues of uneven distribution of income as a primary challenge nowadays and the economists constantly alert their increasing scales and socio-economic consequences.

State tax policy is the main instrument of budget policy and financial means. It is reinforced by the country's constitution, laws, tax code, normative legal acts and other documents. It expresses the applied tax types, tax rates, tax privileges, taxpayer groups and definitions of specific frames, as well as by means of specific mechanisms of taxation. State tax policy is the basis of the comprehensive functions of the state to lay and collect taxes. The main goal of the tax policy is the satisfaction of financial requirements of the state and society, financial requirements of the society, redistribution of income for the benefit of distinct social groups of society and provision of the sustainable and regular development of the economy. The content and goals of the tax policy are defined by the socio-economic structure of the society and specific programs of socio-political groups governing the state.

Methodology. Theoretical basis of the research were standpoints on fiscal policy defined by classical and modern economists and assessment analyses on the influence of fiscal policy aimed at overcoming income inequality and poverty. Informative basis of the research were RA laws, government decisions, RA Ministry of Finance, RA Central Bank and statistical data of RA Statistics Committee. Regression analysis by means of the Least Squares Method was implemented to assess the influence of the fiscal policy on income inequality and poverty in the paper.

Scientific novelty. The scientific novelty of the research is the model that assess the impact of fiscal policy on poverty and inequality and the prediction of the impact of certain fiscal policy instruments on poverty and inequality based on the results of those models,. The model was constructed by regression analysis using the least squares method. The model was calculated using the EViews software package.

Literature Review. There are different approaches to income formation issues of society members and according to them, there are different classifications as well. According to one classification, the sources for income formation are considered to be:

1. Income from employment
2. Income from self-employment
3. Income from ownership
4. Income from transfers.

Income from employment is considered to be the one received by employees and entrepreneurs in the form of salaries and profits. Income from self-employment is the income received by individuals, farmers, and traders as a result of their activities done. Income received from ownership is the rental income on a property, for instance, income from land rent lease, interest on loan capital etc. Income on transfer payments is the one that is received from pension payments from the state, temporary unemployment benefits, childcare allowances, provision of medical care, payments to insecure families, and transfer payments to unemployed people.

The Statistics Committee of Armenia divides the income of the households into two groups, namely monetary income and non-monetary income, and divides monetary income into the following groups:

- Income from the job done,
- Income from self-employment,
- Income from the sale of agricultural produce and domestic animals,
- Income from ownership (rent payments, interest payments and dividends),
- Income from pensions and benefits,
- Income from transfers, and
- Other monetary income.

According to state statistic data, the non-monetary income is divided into two groups, namely foodstuff consumption from personal household and free non-food items and services. The uneven distribution of income is typical of households, independent of the fact that their activities are implemented in the market economy or in centralized planned systems. There are different approaches on the uneven distribution of income and the approaches of the economists on the reasons of income inequality are different. According to M.N.Chepurin, the causes of income inequality are as follows: [Chipurina, Kiselevoj, 2011, p. 675].

- *Difference of people's mental and physical abilities* and this is the reason that they cannot have the same level of productivity, therefore cannot have the same contribution in the production process of goods. This consequence can be observed from the quantitative and qualitative viewpoint. The quantitative refers to the fact that people with better mental and physical abilities are more productive in any time period, thus can produce or design more goods. The qualitative refers to the fact that some people design the same products of better quality and get higher salary and are paid higher for the design of the same goods when compared to the others.

● *Heritage* – the wealth is inherited from one generation to the other, thus creating unequal baseline conditions for other economic entities. Capital, land, financial means, natural resources are forms of ownership and they are an important source of income for any economic entity.

● *Differences in educational levels* – members of society are distinct from each other by their educational level. There are some kinds of job in any economy that require specific qualifications and specialization. Therefore, individuals having high educational abilities will get higher salary than those individuals who do not have such abilities. Therefore, they get higher income compared to the others.

● *Diligence* – people differ by their diligence and hard-working skills. People of the same professional education can have different income level due to their diligence, ambitions and single-mindedness.

● *Luck and success* – some members of the society can get income from casinos and lotteries as well as can lose everything, all their wealth, because of gambling.

● *Composition and structure of the family* – senior people, disabled people and children in the family lead to the fact that the share of the income received by the working members of the family lessens per each member of the family.

James Gortny has also expressed his viewpoint on the reasons of the uneven distribution of income while researching the economy of the USA in the time period between 1960 and 1990 and concluded the following: [Gwartney, Stroup, 2005, p. 803].

● The growing correlation of number of families under the care of a single parent and the other family with two adults earning their income led to the increase of income polarization. In 1960-1990, in the USA, the nature of families has changed to a great extent and the principle of work distribution inside them. In 1994, children in 22% of families were under the care of a single parent. This indicator exceeded the one in the 1960s twofold. At the same time, proportion of married women in the labor force comprising 40% in 1970 increased up to 61% in 1994. Therefore, families with only one parent have lower income compared to the families where two parents have employment.

● Income difference of employees also increases depending on the level of professional skills. In 1960, income of employees having higher education in the USA exceeded the income of individuals without higher education by 27%. This indicator has reached 72% by 1993. The constantly increasing competition in both internal and external markets is its reason. As a result of the competition, companies not only compete for more customers, but also for recruitment of qualified employees. This causes the companies to constantly increase salaries of more qualified labor force.

● Expansion of companies' markets, shift from national to global ones, the continuing decrease of communication and transportation expenses resulted in in-come increase of the companies. Income of only a small number of managers and owners has increased along with it, thus increasing income polarization compared to the employees.

2019 Nobel Prize laureates B.Kremer, E.Duflo and A.Banerjee distinguished 5 reasons causing unequal distribution of income and poverty that are education, health, behavioral biases, gender and politics and credit [Kremer, Duflo, Banerjee, 2019, p. 11]. On the macro level, the main causes of income inequality are: [Dabla-Norris, Kochhar, Suphaphiphat, Frantisek-Ricka, Tsounta, 2015, p. 18].

● *Labor market and its institutions* – income inequality currently emerges first of all from the labor market, so salary allocation as well as "rules of the game" operating in the labor market (minimum salary, role of Labor Unions and social security) is capable of playing a core role in the allocation of society's income.

● *State policy of income redistribution* – progressive taxes and social transfers can be considered the most significant factors capable of having huge influence on the level of income inequality.

● *Scientific and technological policy and industrial policy* - on the one hand, new information technology leads to the increase of general welfare and labor productivity, but on the other hand it can cause increase of income inequality from employment, due to the fact that it leads to disproportionate increase of high quality labor force requirements and reduction of work places at the same time resulting from automation of production processes.

● *Trade globalization* – trade globalization in many countries has become the driving force of competition increase but the lack of trade can influence the level of income inequality and on the other hand, the increase of trade flows leads to salary increases of high quality employees, thus to the increase of inequality, but it can also lead to inequality decrease because of demand for low level employees and salary increases.

● *Education sphere policy* – education sphere policy can play a significant role in decreasing income inequality, due to the fact the education determines choice of the profession, access to workplaces, salary size, as well as it informs on capabilities and productivity of employees in the labor market.

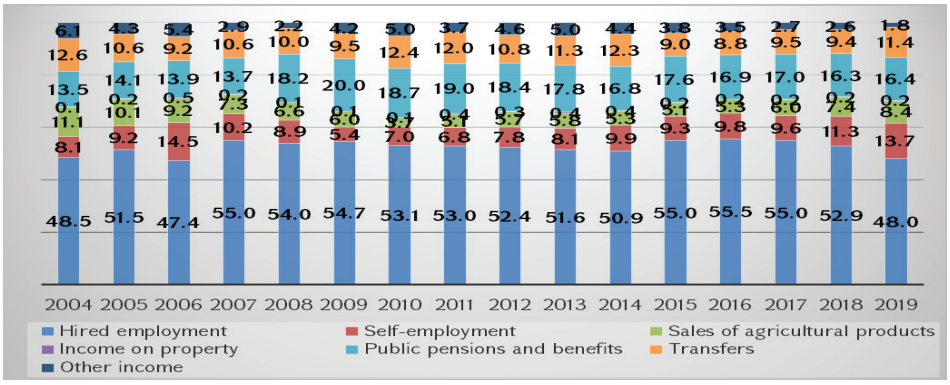

Figure 1. Income composition in 2004-2019

Analysis. Prior to studying income inequality and poverty indicators it is necessary to examine income sources of the population. Figure 1 presents the income composition for 2004-2019 and shows wages constitute the greatest proportion of household income. On average, in 2004-2019 the proportion of wages was in the 50% range, while this indicator was upwards of 70% in developed countries. The second largest source of household income is state pensions and benefits. This proves the government function of income redistribution to be highly significant. Transfers[1] are another source of household incomes and the greatest part of them comes from abroad showing the dependence on the external world.

After studying the income composition we should first understand income distribution among various population segments in order to examine income inequality. Figure 2 presents incomes of the population by decile groups. The data show that the money income of the first decile group rose from 2266 drams in 2004 to 10021 in 2019, i.e. recording an increase of approximately 4.4 times. The income of the tenth decile group rose from 47061 drams to 173781 drams for the same period showing an increase by 3.6 times. This means that the first decile group income rises faster than those of the tenth decile group in the same period. This indicator virtually means income inequality among various decile groups has decreased to a certain extent.

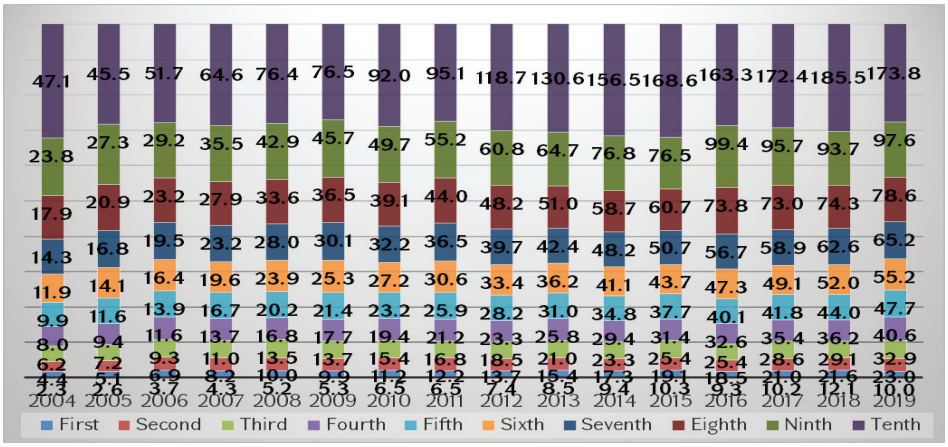

Figure 2. Population income by decile groups (per capita, average, monthly, 1000 drams)

As one of the methods of assessing income distribution inequality is the Gini coefficient, in figure 3 we present it for Armenia in 2004-2019. As the figure shows before the crisis of 2008, though economic growth was high, the supplemental income was unevenly distributed throughout the population and the Gini coefficient recorded an upward trend. During the pre-crisis period the Gini coefficient rose from 0.359 in 2005 to

[1] Transfers from abroad constitute 85-90% of general transfers

0.389 in 2008. As a consequence of the crisis, income inequality among various segments of the population decreased. After the crisis the Gini coefficient increased till 2016 reaching 0.375, and then fell to 0.359 in 2017. In 2019 it rose again to 0.381.

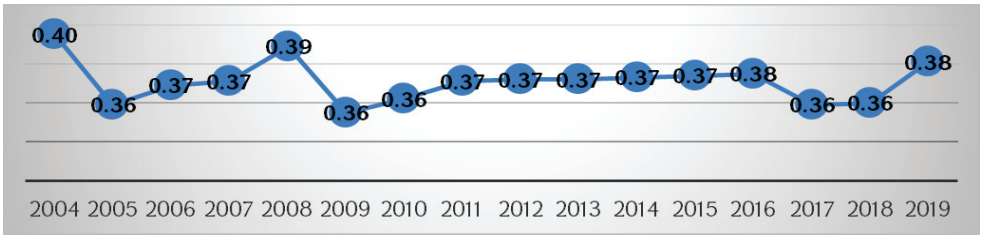

Figure 3. Changes in the Gini coefficient in 2004-2019

Other indicators of uneven income distribution of the population are decile and quantile coefficients. Figure 4 shows the change in decile and quantile coefficients during 2004-2019. The decile and quantile coefficients also indicate that income inequality widened during the pre-crisis period (the decile coefficient rose from 13.9 in 2006 to 15.1 in 2007, and the quantile coefficient increased from 7.6 in 2006 to 8 in 2007). After the crisis these 2 coefficients didn't undergo significant changes till 2019. In 2019 the decile coefficient rose from 15.4 to 17.3.

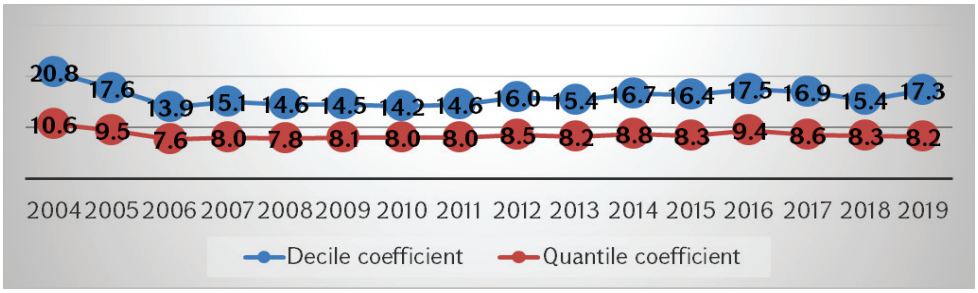

Figure 4. Changes in the decile and quantile coefficients in 2004-2019

Figure 5 presents another indicator assessing income inequality – the Theil Index and the Mean Log Deviation (MLD) for Armenia for the period of 2004-2018. They also show an increase in inequality before the crisis and a decrease after the crisis.

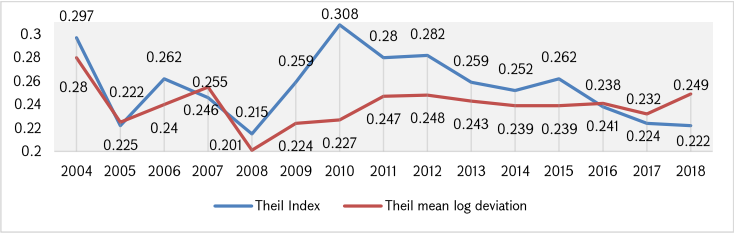

Figure 5. Change in the Theil Index and the Mean Log Deviation in 2004-2018

Poverty rate is one of the quantitative indicators assessing welfare and living standards of the population. Poverty is a socio-economic state of certain segments of the population lacking minimum resources for survival as defined by specific social norms [Kirakosyan, 2009, p. 469].

Poverty takes various forms and touches different aspects of life: consumption, food security, health, education, and rights including rights to vote, security, dignity and dignity of labor. According to the Statistical Committee of the RA one of the indicators of poverty assessment are the food poverty line, the highest and the lowest lines. Table 1 shows their rates for the period of 2004-2019.

Table 1. Changes in food poverty line, the highest and the lowest lines

	Food poverty line	The lowest poverty line	The highest poverty line
2004	12651	20704	25386
2005	13186	19197	24113
2006	13810	19972	25011
2007	14147	20450	25605
2008	17644	24388	29903
2009	17483	25217	30920
2010	19126	27410	33517
2011	21306	29856	36158
2012	21732	30547	37044
2013	22993	32318	39193
2014	23384	33101	40264
2015	24109	34234	41698
2016	23313	33418	40867
2017	24269	34253	41612
2018	24827	35071	42621
2019	23763	35054	53043[1]

The poverty rate is calculated taking into consideration food poverty, the highest and the lowest lines of poverty.

Poverty depth and severity are other indicators of poverty measurement. Figure 7 presents poverty depth and severity indicators for the period of 2004-2018.

Thus, as it was previously mentioned, the credit policy aims at income redistribution and elimination of income inequality and poverty. To understand what tools of credit policy affect and how they affect income inequality and poverty, it is necessary to identify what factors influence them in general.

[1] Indicators for 2019 are calculated based on revised poverty assessment methodology of ILCS conducted in 2019

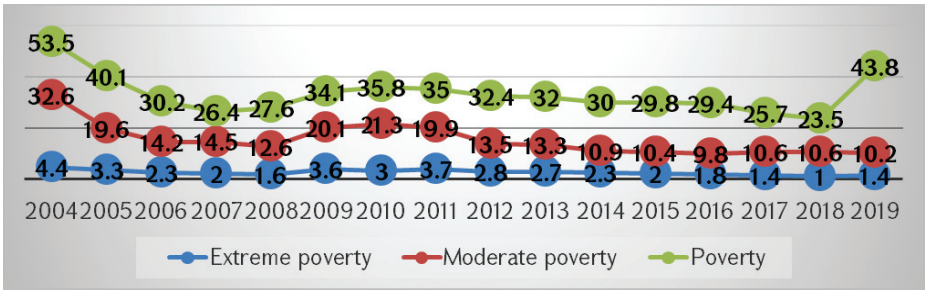

Figure 6. Changes in the levels of extreme poverty, moderate poverty and poverty in 2004-2019[1]

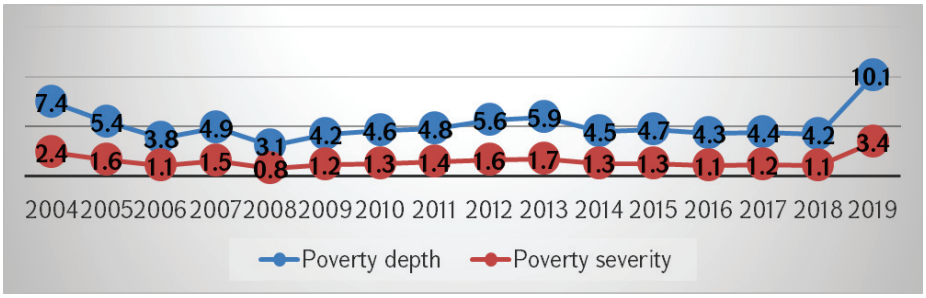

Figure 7. Changes in poverty depth and severity in 2004-2019[2]

First, forces affecting the change in income inequality were examined. A linear regression model was developed for this purpose. In this model the rates of state-collected income tax, average monthly pension, social costs incurred by the government and monthly nominal income in the sphere of construction were chosen as independent variables. While as a dependent variable the quantile coefficient was selected. As compared with the previous years all the indicators presented growth trends. The stationarity of all indicators were tested with the help of the tools provided by *Eviews*. Thus, the interaction model among variables used takes the following form:

$Q_t - B_0 + B_1 * IT_t + B_2 * P_t + B_3 * SC_t + B_4 * CW_t + \varepsilon_t$ where

Q_t – increase in the quantile coefficient in the year *t*

IT_t –increase in the rates of income tax in the year *t*

P_t – increase in the average monthly pension in the year *t*

SC_t – increase in the rates of social costs in the year *t*

CW_t - increase in average monthly nominal wage in construction in the year *t*

B_0- B_4-unknown parameters of the model

ε_t – error of the model

[1] Indicators for 2019 are calculated based on revised poverty assessment methodology of ILCS conducted in 2019

[2] Ibid

By applying the least square method, the model assessment will take the following form:

$$Q_t = 107.6 + 0.11 * IT_t + 1.11 * P_t - 0.22 * SC_t - 1.1 * CW_t$$

The results of the model prove that social costs and the average monthly wage in the construction sphere negatively affect the quantile coefficient, i.e. they have a positive impact on the elimination of income inequality. 1% increase in social costs reduces the quantile coefficient by 0.22%. This shows that the state credit policy, especially social costs that are incurred, greatly contributes to the elimination of income inequality. Nominal wages in the sphere of construction as an independent variable were selected for 2 reasons. First, construction provides work mainly to people with low education level and the latter constitute the first and second decile groups of the population. Second, the construction sphere is characterized by capital investments, so the study of the impact of the construction is equivalent to the study of the effects of capital investments. 1% change in nominal monthly income in construction reduces the quantile coefficient by 1.1%. Income tax and average monthly pension levels have a positive influence on the quantile coefficient. 1% change in the income tax rate results in the change of the quantile coefficient by 0.11%. This means that the income tax doesn't contribute to the decrease in income inequality. This in turn implies that the income tax is non-progressive that leads to the widening of inequality. 1% change in average monthly pension rate changes the quantile coefficient by 1.11%. This proves that the pension system doesn't operate properly thus contributing to the increase in income inequality.

With the help of a linear regression model, factors affecting changes in poverty were studied. In this model the rates of unemployment, state-collected income tax and average monthly wages in the construction field were selected as independent variables, while volumes of income of the first quantile groups were selected as dependent variables. The first quantile group income level was selected as an independent variable as this group constitutes the poor segment of the population. The stationarity of all indicators were tested with the help of the tools provided by ***Eviews***. Thus, the interaction model among variables used takes the following form:

$FQ_t = B_0 + B_1 * IT_t + B_2 * UR_t + B_3 * CW_t + \varepsilon_t$ where

FQ_t – increase in the incomes of the first quantile group in the year *t*

IT_t – increase in income tax rates in the year *t*

UR_t – increase in unemployment rates in the year *t*

CW_t - increase in the average monthly nominal wage in construction in the year *t*

B_0- B_4-unknown parameters of the model

ε_t – error of the model

By applying the least square method the model assessment will take the following form:

$$FQ_t = 51.8 - 0.04 * IT_t - 0.29 * UR_t + 0.87 * CW_t$$

The results of the model prove that changes in the state-collected income tax and unemployment rates have a negative effect on the income rates of the first quantile group. 1% change in the income tax rate changes the income of the first quantile group by 0.04%. As in the case of the model of variables affecting income inequality, this proves that income tax system has no progressivity and it negatively influences income inequality as well as the first quantile group income. 1% change in unemployment rate changes the first quantile group income by 0.29%. This is natural, as the study of income composition proves that wages constitute the largest part of population income. Consequently, the increase in unemployment rate will contribute to the decrease in income rates of the population. Average monthly income in the sphere of construction positively affects the income rates of the first quantile group. Its 1% shift changes income rates of the first quantile by 0.87%. People with low education level are engaged in construction and they constitute the first and second decile groups of the population. As a consequence, the change in wages of those working in construction positively influences both the elimination of income inequality and the increase in the income of the first quantile group.

Conclusion. After studying the income composition by decile groups we have revealed that the first decile group income increases faster than those of the tenth decile group, so income inequality gap widens in the period under study. Taking into consideration the analysis of poverty indicators we can conclude that there is a certain progress towards the elimination of poverty. The proportion of the poor and moderately poor segment has significantly reduced, while that of the extremely poor population has reached 1%.

The results of the models assessing income inequality impacts show that the state social costs and average monthly nominal wages have a positive effect on income inequality. Income inequality is negatively affected by the increase in average monthly pension rates and state- collected income taxes. Taking into account the results of the model assessing factors that influence poverty, it becomes obvious that average monthly wages in the construction sphere have a positive effect on the income of the poor segment of the population, while state-collected income tax volumes as well as unemployment rates have a negative effect on them.

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Ruben GHANTARCHYAN, Alik TOROSYAN

Assessment of fiscal policy impact on income inequality elimination and poverty alleviation poverty

Key words: income inequality, poverty, taxes, budget, fiscal policy

The paper analyzes the impact extent of individual instruments of the monetary policy on income inequality and poverty alleviation. Therefore, we firstly studied the stand-points presented by various economists on income inequality and poverty, the nature of income inequality and poverty, its consequences and the main causes. Then the move-ment of indicators characterizing income inequality and poverty in Armenia during the last decade were studied, the current state of those problems and the main reasons for their drastic changes were analyzed. The article also developed two models and per-formed a regression analysis using the Least Squares Method. First, the model assesses the impact of monetary policy on income inequality, examines the main reasons for indi-vidual monetary policy instruments impact. Then, through the other model, the extent of the impact of individual instruments of monetary policy on poverty was calculated, and the main reasons of the impact extent of individual instruments of the monetary policy were studied.

EVALUATING MEAN TIME TO OPERATION (MTTO) AND OTHER RELIABILITIES METHODS FOR COMPUTING CRITERION RELIABLE RISK OF RETURN (RRR) IN TEHRAN STOCK EXCHANGE

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Keywords: Portfolio, MCDM[1], DM[2], Criteria, MTBF, MTTF and FIT

Introduction. Devising the rating model and using it in Tehran Stock Exchange makes it possible for investors to distinguish more effective companies from other ones better. Therefore, they would do more rational investments and, on the other hand, the efficient portfolios can access their needed financial resources more easily and cheaply. It helps the capital market to move toward efficiency (Jafari, 2015). A Portfolio manager as a decision-maker needs a decision matrix that is a list of values in rows and columns that allow an analyst to systematically identify, analyze, and rate the performance of relationships between sets of values and information. The matrix is useful for looking at large masses of decision factors and assessing each factor's relative significance. The nice thing about the decision matrix is that it can apply to many different types of decisions.

A decision matrix is a list of values in rows and columns that allow an analyst to systematically identify, analyze, and rate the performance of relationships between sets of values and information. Elements of a decision matrix show decisions based on certain decision criteria (Lucid Content Team). The suitable criteria for DM are important. Defining RRR as the efficient and suitable criterion for the decision matrix is the aim of this research. For this purpose, RRR is calculated with reliability engineering. These techniques are a sub-discipline of systems engineering that emphasizes the ability of equipment to function without failure. Reliability describes the ability of a system or component to function under stated conditions for a specified period. Reliability is typically described as the ability of a component or system to function at a specified moment or interval of time (IEEE, 1990).

Scientific Novelty. This study evaluates a new criterion with high efficiency in the decision matrix as a criterion with good quality in Multi-Criteria Decision Making (MCDM) methods. This paper proposes a criterion Reliable Risk of Return (RRR) that it can show how an investor can trust to return of a company that their return more than a specific amount that investor defines it also proposes Mean time to operation (MTTO) technique for calculating criterion RRR. The MTBF, MTTF, FIT are famous reliability techniques in engineering for computing reliability of a system, these techniques were

[1] Multi Criteria Decision Making
[2] Decision matrix

used in this research for calculating RRR in Stock Market to construct portfolios and find a profitable company.

Structure. We propose a new criterion RRR for a decision matrix in the stock market as an efficient criterion for DM in MCDM methods (Rew, 1988) and can use it for computing the weight of alternatives (companies) and rank to them independently. The remainder of this paper is organized as follows. Section two reviews some concepts for this research. The third part presents the steps of research and use the RRR criterion to a real-world problem. Section five illustrates the result of the real-world problem and comprehensively compared it to the Bank deposit and Market Index. The conclusions and suggestions for future research are represented in the sixth section.

Literature review. A suitable criterion for DM in each research is important. This paper tried to propose to use new techniques for calculating criterion Reliable Risk of Return (RRR) for the stock market. For calculating the RRR criterion needs to compute the real price of the company's share for each trading day, to obtain the real price need to have DPS, capital increment and trading commissions. After collecting data need to show their effects on the stock price. The real price works like the main material for calculating the RRR that it calculates with reliability techniques.

Real price. The first thing as a base material of this research is the real price of each trading day. To compute real price we need price of stock for each trading day, capital increment, DPS and trading commission. After collecting these data we must add these data to stock price for this purpose, using the below formula:

$$Real\ price = (coeficient\ of\ capital\ increment \times (stock\ price \times trading\ commission)) + DPS \quad (1)$$

The RRR criterion needs methods for calculating reliability like MTBF, MTTF and FIT that they used in engineering and much science as a reliable technique.

Used reliability techniques. Reliability is the ability of a system or component to perform its required functions under stated conditions for a specified period. Availability, on the other hand, is the degree to which a system or component is operational and accessible when required for use [IEEE, 1990]. Most of the methods used to calculate reliability criteria these methods are used in many sciences. This research tried to use them as a reliable criterion in the stock market. MTBF, MTTF and FIT are reliability terms based on methods and procedures for product lifecycle predictions. Customers must often in-clude reliability data when specifying what product to buy for their application. MTBF (Mean Time Between Failure), MTTF (Mean Time To Failure) and FIT (Failure In Time) are ways of providing a numeric value based on a compilation of data to quantify a failure rate and the resulting time of expected performance. The numeric value can be expressed using any measure of time, but hours is the most common unit in practice. In this research measure of time is the day [Advantech, 2018].

In this study lifespan is trading days that stock of a company is traded and the failure rate is the number of times that stock price is less than specific amount and operation days are the days that stock price is over than specific amount. This probability is estimated from detailed analysis, previous data sets or through reliability testing and reliability modelling. Availability, Testability, maintainability and maintenance are often defined as a part of reliability engineering in reliability programs. Reliability often plays a key role in the cost-effectiveness of systems. Most of the methods used to calculate reliability criteria these methods are used in many sciences [RCM II, 2008]. Tracking and managing equipment and device failures are essential for any organization that relies on physical assets to deliver its product or service. It is the only way to keep operational disruptions down to a minimum. Measuring failure metrics is an integral part of asset management. MTBF points to the reliability of our equipment, and MTTF tries to estimate the average lifespan of non-repairable assets. These are by no means the only maintenance-related metrics. However, they are very popular, so we are giving them extra attention to MTBF, MTTF, FIT and MTTO as a technique that will propose in this study. For each of the stated methods, this research will: Explain what it measures and why it is helpful, provide a graphical representation, use an example to show how it is calculated and discuss what you can do to improve it.

MTBF. Mean time between failures (MTBF) is the sum of the lengths of the operational periods divided by the number of observed failures (Lienig & Bruemmer, 2017):

$$MTBF = \frac{\sum(start\ of\ downtime - start\ of\ uptime)}{number\ of\ failures} \quad 2)$$

Product purchasing decisions should not be based on feature sets alone. You should also consider the product's life expectancy. Understanding the methods used to predict a product life cycle will help you make informed decisions. Mean Time Between Failure (MTBF) is the number of failures per million hours for a product. This is the most common parameter used to predict a product's life span. Industries and integrators tend to pay close attention to MTBF, but consumers are often price-driven. They may not realize that a product with a short lifespan is not much of a bargain.

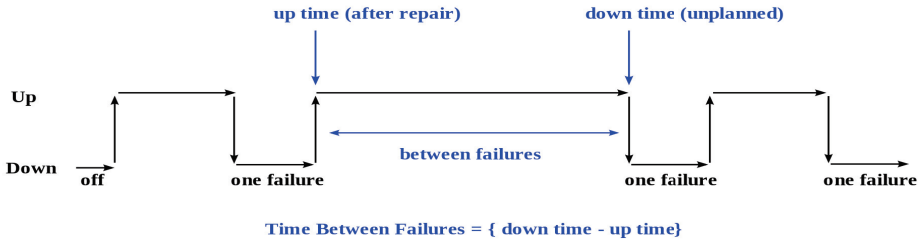

Figure 1. Lifecycle of a system

For example, an asset may have been operational for 1,000 hours in a year. Over the course of that year, that asset broke down eight times. Therefore, the MTBF for that piece of equipment is 125 hours [Hilt, Bakos & Jaro, 2016, 74-75].

MTTF. Mean time to failure (MTTF) is a maintenance metric that measures the average amount of time a non-repairable asset operates before it fails. Because MTTF is relevant only for assets and equipment that cannot or should not be repaired, MTTF can also be thought of as the average lifespan of an asset. To calculate MTTF, divide the total number of hours of operation by the total number of assets in use.

$$MTTF = \frac{\text{Total time of operat}}{\text{Total assets in us}} \quad 3)$$

Calculating MTTF with a larger number of assets will lead to a more result as MTTF represents the average time to failure. Example of MTTF calculation:

For example, we want to calculate the MTTF of the conveyor belt rollers at your facility. There are 125 identical rollers, which operated a total of 60,000 hours in the last year. Your MTTF calculation would look like this:

MTTF = Total hours of operation ÷ Total assets in use = 60,000 hours ÷ 125 assets = 480 hours

We can conclude that the average lifespan of a roller at your facility is 480 hours.

MTTF applies to assets that are non-repairable—when they fail, they are replaced (Fiix, n.d.).

MTTO. Mean time to operation (MTTO) is a maintenance metric that measures the average amount of time a repairable asset fails after its operations. Because MTTO is relevant only for assets and equipment that can or should be repaired, MTTO can also be thought of as the average duration of failure of an asset. To calculate MTTO, divide the total number of hours of failures by the total number of assets in use.

$$MTTO = \frac{\text{Total time of failu}}{\text{Total assets in u}} \quad 4)$$

FIT. By definition Failure Rate is the total number of failures within an item population divided by the total number of life units expended by that population during a particular measurement interval under stated conditions. It is usually denoted by the symbol λ. The dimension of the failure rate is the reciprocal of time and the unit used is 10^9/hr = 1 FIT (Failure in Time). In other words, 1 FIT mean 1 fail in 1,000,000,000 hours [Lienig & Bruemmer, 2017].

$$FIT(MTBF) = \frac{1}{MTBF} \times \quad 5)$$

Failure rate is the frequency with which an engineered system or component fails, expressed in failures per unit of time. It is usually denoted by the Greek letter λ (lambda) and is often used in reliability engineering. The failure rate of a system usually depends on time, with the rate varying over the life cycle of the system. For example, an automobile's failure rate in its fifth year of service may be many times greater than its failure

rate during its first year of service. One does not expect to replace an exhaust pipe, overhaul the brakes, or have major transmission problems in a new vehicle.

Suppose it is desired to estimate the failure rate of a certain component. A test can be performed to estimate its failure rate. Ten identical components are each tested until they either fail or reach 1000 hours, at which time the test is terminated for that component. (The level of statistical confidence is not considered in this example.)

Estimated failure rate is:

$\frac{6\ failures}{7502\ hours} = 0.0007998\ \frac{failures}{hour} = 799 \times 10^{-6}\ \frac{failures}{hour}$, Or 799.8 failures for every million hours of operation (Li et al. 2010).

Failure In Time (FIT) is another way of reporting MTBF. FIT reports the number of expected failures per one billion hours of operation for a device. This term is very important in the semiconductor industry, but is also used by component manufacturers. FIT can be quantified in a number of ways. Examples include: 1000 devices for 1 million hours, 1 million devices for 1000 hours each, and other similar combinations. FIT and Confidence Limits (CL) are often provided together. In common usage, a claim to 95% confidence in something is normally taken as indicating virtual certainty. In statistics, a claim to 95% confidence simply means that the researcher has seen something occur that only happens one time in twenty, or less. For example, component manufacturers will take a small sampling of a component, test for x number of hours, and then determine if there were any failures in the test bed. The CL will be based on the number of failures that occurred [Khavaninzadeh, 2021].

Tip2. In this research instead of 109 used 365 as a year and total days of a company's share traded.

Example of real-world. This section explains the process of calculating the RRR criterion with an example. For this purpose, are selected ten companies from different industries listed on the Tehran Stock Exchange.

Population and sample. The process of selecting alternatives in choosing companies from the listed companies in Tehran stock exchange with some rules likes they have worked more than six years, different industries, their shares are traded in the market every year and their data be available like trading days, capital increment and DPS. In this research, ten companies were selected from this list.

Data collection method. Collecting information has been done based on the return of companies. The important things are closing price for each day of the year, capital increase and DPS. This information was obtained from reliable sites that belong to the Tehran Stock Exchange itself. The data are used in this research include closing prices, capital increment and DPS from 1393 to 1398 of ten companies of Tehran Stock Exchange. All this information can change the closing price but there are other things that to make data more accurately are trading commission. The commission calculated at the

end of each trading day; can help investors to find the accurate return of the company. After collecting data, the process on them begins to convert them to useful data for this research. For this purpose must change closing price after increment capital, DPS and buy and sales commission.

Data analysis. For analyzing data that collected must use them in reliability methods and find results. For this purpose define these methods for the stock market. Failure system happens when the days that the price of a share is less than the specific price that the investor determined as a minimum gain of investing and the number of failures is several periods of failure in a specific period that investor determined it. Operation system happens when the days that stock returns more than investor determined profit. The role of real price is important to calculate the operation system and failure system.

Step by step of process with example of real world. Now it is time to explain steps of calculation of RRR criterion and show them with an example of Tehran Stock Exchange, for this purpose is chosen "Bekab" company of listed company in TSE[1].

Frist step: Investors must determine the amount of profit that they expect in a year then must determine a parameter that can satisfy investors' expectations of the investment. This parameter is mandatory Materiel Reliability (RM) it defines the amount of stock that can be supposed expected profit for one year. In this research, RM is twenty percent.

Table 1. Calculated RM for a company

Bekab	1395	1396	1397	1398	1399
RM	13856	13637	14713	11596	92694

Second step: calculating total days that stock traded.

Table 2. Calculated Trading days for a company

Bekab	1395	1396	1397	1398	1399
Trading days	234	235	224	229	227

Third step: Compute the number of system failures, fail days and operation days.

Table 3. Calculated Fail number, Fail days and Operation days for a company

Bekab	1395	1396	1397	1398	1399
Fail Number	1	5	2	1	3
Fail Days	234	74	210	17	52
Operation Days	0	161	14	212	175

[1] Tehran Stock Exchange

Fourth step: Use reliability methods MTBF, MTTF, MTTO and FIT in four modes. These methods are explained in the previous section with formulas (2-5).
After computing the amount of MTBF, MTTF and FIT for each company annually then calculate the average of each year with previous years.

Tip2. For calculating the MTTF needs to know the weight of assets. For this purpose, as a rule, suppose the assets have the same weight for the first year in the portfolio.

Table 4. Calculated reliability methods for a company

METHODS	1395	1396	1397	1398	1399
MTFB	0.00	32.20	7.00	212.00	58.33
MTTO	2340.00	1303.06	3277.17	564.25	838.25
MTTF	0.00	2835.03	218.48	7036.55	2821.05
FIT(MTBF, trading days)	234.00	7.30	32.00	1.08	3.89

Fifth step: Compare results of recommended companies and portfolios by each method in two types. This step compared the return of each company and portfolio that is recommended by reliability methods in two modes annual and average for ten companies that selected from the list of companies in Tehran Stock Exchange.

Sixth step: To make a decision. Now it is time to find the best portfolio and company that is recommended by reliability methods. Absolutely if the investors choose only one company that system recommended has more risk than a portfolio that the system recommended.

Table 5. Calculated MTTF for a company

MTTF											
Company	Faravar	Behbahan	DPI	Shefan	Hafari	Hekasht	Lebtan	GheShe	Bekab	PeShand	MAX
1397	545	3948	237	3337	5356	1674	4900	683	218	1238	5356

The recommended company by system is “Hafari” for 1398 and recommended portfolio with MTTF for 1398 is:

Table 6. The Calculated weight of companies and return of the portfolio

1398	Company	Faravar	Behbahan	DPI	Shefan	Hafari	Hekasht	Lebtan	GheShe	Bekab	SUM
Weight	0.025	0.178	0.011	0.151	0.242	0.076	0.221	0.031	0.010	0.06	1.00
Return	62.99	4.02	16.66	44.44	16.79	83.57	14.17	6.97	28.94	283.83	283.83

Analysis. This section shows the return of each portfolio constructed with only the RRR criterion according to each reliability technique. The MTBF, MTTF, MTTO and FIT are methods used for calculating the RRR criterion proposed in this research. To understand ability of this criterion needed to use it in the real example of the Tehran Stock Market. Assumed we have ten alternatives and only one criterion and RRR calculated by different reliability methods. Compare return of each method can be a good criterion for obtaining RRR performance. The below charts show their return.

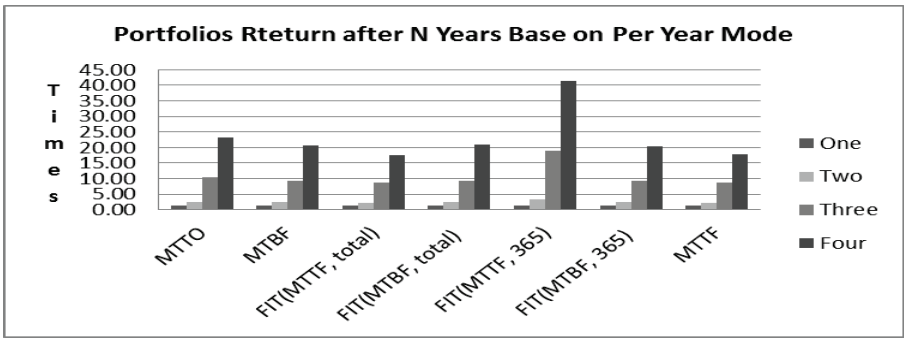

Figure 2. Returns of each portfolio that constructed with RRR after N years with reliability techniques based on Per Year mode

This chart shows the return of each portfolio that was calculated with reliability methods based on per year mode from 1396 to 1399 that the system recommended. The FIT [MTTF, 365] has performed better than other methods. The FIT [MTTF, 365] make an investor's capital 41.42 times more than the beginning of investing after four years.

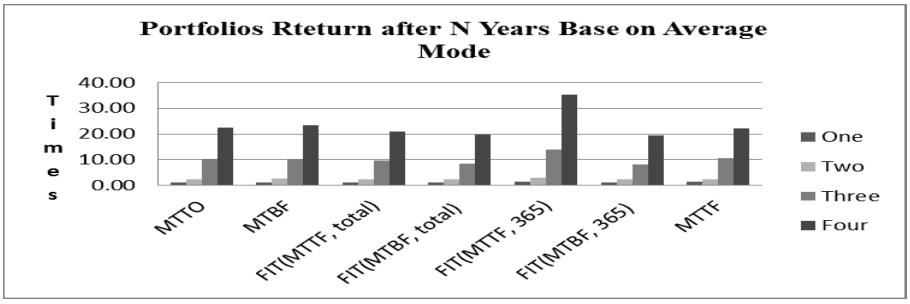

Figure 3. Returns of each portfolio that constructed with RRR after N years with reliability techniques base on Average mode

This chart shows the return of each portfolio calculated with reliability methods based on the Average mode from 1396 to 1399 that the system recommended. The FIT [MTTF, 365] has performed better than other methods again. The FIT [MTTF, 365] make an investor's capital 35.23 times more than the start of investing after four years.

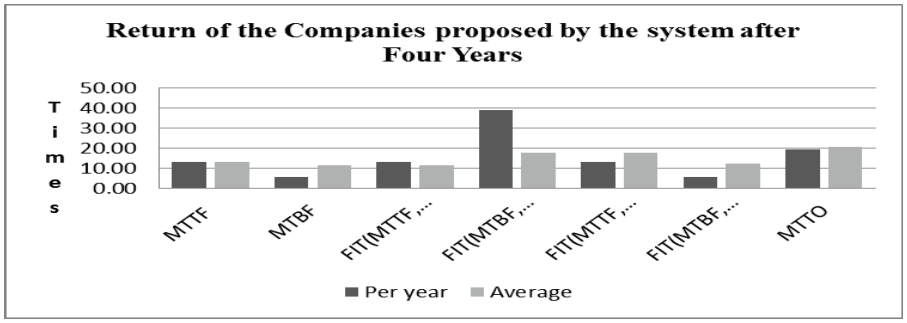

Figure 4 Return of each portfolio base on Per Year and Average

Figure 4 shows the return of portfolios with only one company that is recommended by the system for each year. The return of FIT (MTBF, Total) based on per year is more than others methods. The FIT (MTBF, total) make an investor's capital 38.79 times more than the beginning of investing after four years.

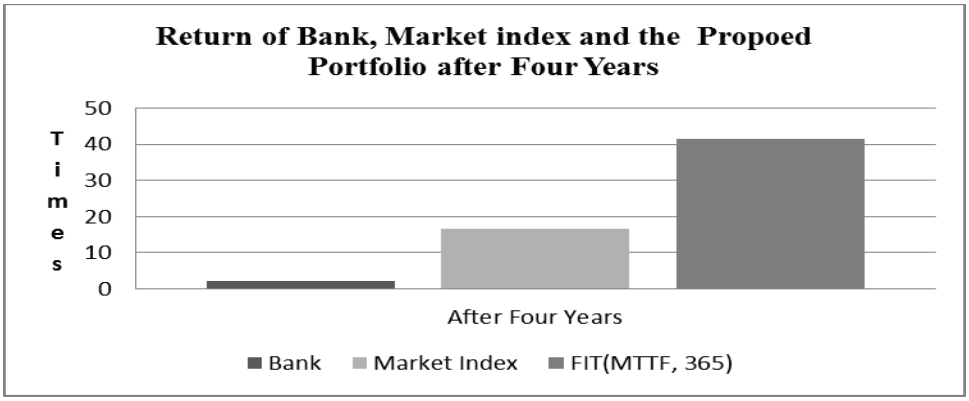

Figure 5 Returns of Bank, Market and portfolios constructed with FIT (MTTF, 365) based on per year after four years.

This chart shows the return of BANK, Stock Market Index, and FIT (MTTF, 365) as the best method for constructing a portfolio. The FIT [MTTF, 365] constructed the best portfolio. The portfolio is recommended with FIT [MTTF, 365] base per year mode for constructing the portfolio for 1400 is in the below table:

Table 7. Recommend a portfolio for 1400

1400	Faravar	Behbahan	DPI	Shefan	Hafari	Hekashti	Lebutan	GheShekar	Bekab	PeShand
Weight	0.02	0.02	0.03	0.04	0.03	0.73	0.06	0.01	0.04	0.03

Conclusions. This paper has used famous reliability techniques MTBF, MTTT, FIT and MTTO in the stock market. The companies are from different industries listed on the Tehran Stock Exchange. All methods that used to calculate the RRR criterion were succeeded to decrease their risks and increasing their return but investing in the bank and stock market could not do such work. The results are determined in Figures 5 and 6.

FIT [MTBF, Total] method is suitable more than other methods for recommending a company with a high return. On the other hand, if investors want to make a portfolio, FIT [MTTF, 365] has a stronger performance to construct a portfolio with only criterion RRR than other techniques. In the end, the article recommends a company and a portfolio for next year. This paper can be useful to research in future studies and different types of investors like funds, brokers, risky and risk-avert and beginner investors.

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Arash JAHAN BIGLARI

Evaluating Mean Time to Operation (MTTO) and Other Reliabilities Methods for Computing Criterion Reliable Risk of Return (RRR) in Tehran Stock Exchange

Keywords: Portfolio, MCDM[1], DM[2], Criteria, MTBF, MTTF and FIT

This study evaluates a new criterion with high efficiency in the decision matrix as a criterion with quality in Multi-Criteria Decision Making (MCDM) methods. This research discusses some concepts such as reliability techniques, MCDM, decision matrix (DM) and real return also proposes a criterion Reliable Risk of Return that is called RRR. This criterion can show how an investor can trust to the return of a company that their return is more than the specific amount that the investor defines it. For this purpose, by applying a creative to use reliability techniques that are usually used in other science, especially engineering. This research proposes a new technique MTTO and uses other reliability techniques creatively. Results of this research can be helpful for investors to choose the best company from the list of companies also recommend profitable portfolios. The MTBF, MTTF, FIT and MTTO are famous techniques that are used to calculate the reliability of a system.

[1] Multi Criteria Decision Making
[2] Decision matrix

COMPATIVE ANALYSIS OF DEEP LEARNING MODELS FOR DDOS ATTACKS DETECTION

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Keywords: DDOS, DFF, CNN, BiLSTM, deep learning

Introduction. Data stored online keeps growing more and more each year, causing a corresponding increase in data value. This, in turn, causes a growing number of threats that come up to target systems containing the data and maliciously access them. The DDoS (Distributed Denial of Service) attack utilizes multiple machines to develop the flooding of packets directed to an aimed machine to create the service disruption on the target computer machine [4].

DDoS attacks are quickly developing in magnitude and complexity in tandem with the rise of new web technologies on the internet [2]. This being the case, many people have conducted extensive studies to determine how this issue can be mitigated by developing specific tools to aid in the endeavor, developing several deep learning techniques, and GPU inventions. This shows that there is promise in developing faster high-performance detection techniques [1].

Scientific novelty. The development of the latest technologies in almost all spheres makes it possible to accelerate the implementation of works, ensuring high efficiency. But at the same time, the digitization of complete information brings with it a number of problems, among which the issue of information security can be singled out. It is impossible today to imagine the work of any branch of the economy without digitalization, but given the dangers and opportunities of many cyber attacks in the world, there is also a need to follow the rules of cyber security, to avoid possible attacks and losses as a result. Therefore, companies face potential cyber threats to their network environment and computer machines that may cause severe effects to their operations, like business downtime, ransom demands, and data breaches from hackers.

The topic is a novelty since it enables the organization to determine key approaches to detecting DDoS attacks and utilize several machine learning techniques. With the development of deep learning methods and powerful GPU hardware, there is significant potential to create devices and techniques to detect DDoS attacks instantly. The discovery of DDoS attacks is important before any reduction approaches can be applied.

About Deep Learning. Deep learning is a field of Computer Science that enables companies to use sophisticated feature embedding techniques to learn from historical data and accurately predict new data with desirable outcomes. This method has been used successfully in many application areas, such as stock market prediction sentiment analysis, text categorization, natural language processing, and so much more [2].

Deep Feed Foward algorithm. Deep feedforward networks, also known as feedforward neural networks or multilayer perceptron's (MLPs)[5]. Their goal is to approximate some function f*. In perceptron where neuron value is 0 or 1, the weighted some are greater than some threshold value. In our case, we will use the sigmoid neuron.

CNN-Bi-LSTM algorithm. A CNN-BiLSTM is a hybrid bidirectional CNN and BiLSTM architecture. It can learn both character-level and word-level features. The CNN component induces character-level features. Each model applies a max-pooling and convolution layer to excerpt a new characteristic vector from the per-character featured vector like the character embeddings and character kind.

Methodology. The dataset used in the study involved is the DDoS Botnet Attack on IoT a71a0b42-4 available at Kaggle. The dataset is large and contains 47 feature columns. So the aim is to create a DDoS attack by aggregating information on packets [3]. The created model then analyzes these packets and classifies each time window into a period where a DDoS attack is underway or not. DDoS attacks take over the management of a large number of computer systems known as a botnet and launch synchronized attacks on the specific system.

*Data Normalization.*Certain components are involved in the pre-processing stage of the normalization of the datasets. The components are' data acquisition, Data pre-processing, Model Classification, Output evaluation. Since we have already acquired the data, the next stage is the pre-processing stage. This stage involves processing the data to make it available for training to minimize overfitting. The first stage of pre-processing is noise filtering; the next stage is filling in missing data values and, lastly, creating classes categorized in the form of reflection and exploitation attacks.

Train models. Train models applied two different deep learning models for our approach. When using Bi-LSTMs to extract information from data, they are preferred due to their ability to keep track of this unique information sequence. This overcomes the limitations of traditional LSTMs and RNNs [3]. This research, using BiLSTMs, uses two hidden layers to predict DDoS attacks based on historical data. The data is credited in a multilayer perceptron when using feed-forward neural networks to obtain corresponding threshold values. The problem of Open Set Recognition (OSR) has severe effects on the detection of DDoS attacks since its technology keeps evolving and cause varying traffic feature. A New BI-LSTM model was recommended for detecting unknown attacks in computer machines.

Analysis. The experiments were performed on the datasets using Python. The results were measured through accuracy and precision for both approaches for the two algorithms. We also passed the datasets through a confusion matrix for both algorithms to test the outcome performance of both on the dataset. It was found that the more iterations on the testing data, the higher the accuracy from each iteration.

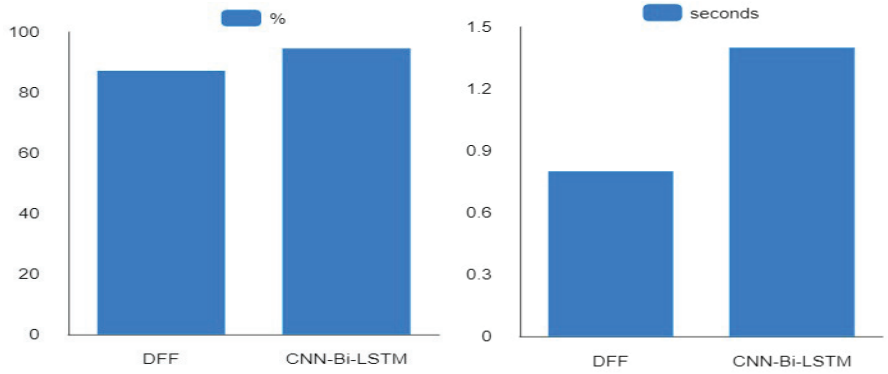

Figure 1. Graphical representations

Outcome 1. Using the CNN-Bi-LSTM with a filter size of 9 * 9 and a filter count of 18, we notice that this model performs 94.6% accuracy. The confusion matrix used in this algorithm classified normal and attack categories with a rate of 0.95 for all outcomes.

Outcome 2. With the second algorithm used, with the training of a batch of 100 trees, the model accuracy was 87.2%. The result for both the confusion and evaluation matrix performed by this algorithm showed a false positive rate of 0.007 and a false negative rate of 0.003.

Graphical Representation. Below are graphical representations of both density plots and confusion matrix performed on the dataset. The graphs created were further compared against each other. From the graphs, it shows that the performance was close.

Conclusion. With the increase of data on the internet and the rise of threats to internet threats, DDoS attacks have become rampant. Traditional intrusion detection systems can only work with small amounts of data. This necessitated using improved methods to handle large amounts of data. These two algorithms were able to achieve that. In terms of accuracy, it was found that CNN-Bi-LSTM achieved a high mean percentage accuracy in testing and training data (94.6%) with detecting the time of 1.4 seconds. feedforward neural networks, performed faster than the other one (0.8 seconds) but loses in the accuracy (87.2%). Also, the feedforward neural network had a faster clocked time than the hybrid network. With an increased rate of data on the internet, new opportunities for threats to aim sensitive data have raised several security challenges like malicious intrusions. Throughout the paper, the application of a machine learning algorithm for the issue of DDoS attack detection has been explained; hence further should be done to improve on detection of cyber-crime. The deep learning model is a valuable choice for the classifications of DDoS attack packets in the perspective of problem detection accuracy.

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Artur PETROSYAN, Eduard HARUTYUNYAN, David GALSTYAN
Compative analysis of Deep Learning Models for DDOS Attacks Detection
Keywords: DDOS, DFF, CNN, BiLSTM, deep learning

Recently, Distributed Denial of Service(DDOS) attacks have been on the rise and come in very many forms costing many technology firms a lot of time and money. In this study, deep learning models were compared in terms of performance, to solve the problem of detecting these attacks. The first step to mitigating DDOS attacks is by first identifying them, which serves as a toll order. This report used two deep learning models: the Deep Feed Forward (DFF) algorithm and a hybrid containing a CNN with BiLSTM (bidirectional long short-term memory). To compare these algorithms, the "DDoS Botnet Attack on IoT a71a0b42-4" dataset available on Kaggle was chosen. The dataset was undergone various evaluations to find out the performance metrics between the two algorithms. From the simulations conducted, DFF was found to have an accuracy of 87.2% with detecting the time of 0.8 seconds, while the CNN-Bi-LSTM was found to have an accuracy of 94.6% with detecting the time of 1.4 seconds.

ANALYSIS OF INTERNATIONAL EXPERIENCE IN FINANCING EDUCATION

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Keywords. education, budget, economic development, universities

Introduction. Education does not stand still; it is varied and constantly changing. Education changes the way we look at learning and the concept of something or any problem. Correct education and upbringing of people with a new edification is associated with the development of society and, of course, the country. With regard to the development of a country or society, it is believed that differences in educational levels are one of the main reasons for differences in economic performance between developed and developing countries [Sezer & Mercan, 2014, 925-930]. Funding for education is very important for the nation state to maintain the level of education at the current level. Becker viewed education funding as a capital investment. Investing in education helps a society not only educate people, but also contribute to the overall progress of citizens and social change. Better educated people are believed to have more accurate expectations and pursue their aspirations more effectively than people with lower levels of education [Vila, 2005, 3-10].

Scientific novelty. Our main hypothesis is based on an idea that education is the main driving force behind personal, national and global development, and education spending in a country is interrelated with economic development. Countries with higher per capita in-omes invest more in children's education. Efforts to promote more inclusive economic growth and better education systems can expand the reach of young people in developing countries and reduce inequalities between genders and social groups.

Thus, in this work, we intend to explain that investing in education does not mean developing infrastructure, using updated technologies, filling the university library with outdated and useless books, buying expensive devices only for a good world ranking of universities, but sectoral planning, investing in education, launching new time-oriented courses for all levels of education, training teachers tailored to the level of students and the learning environment, ensuring the availability of the most recent and most important books in the library, and providing government scholarships to highly qualified graduates, providing students with home-return guaranteed study abroad, etc.

Literature review. Investment in education is a catalyst for effectively preparing the next generation for the country's economic, social and cultural development. Econo-

mists believe that the time and money invested in paying for education pays off and that they have a positive net effect on the ability to meet human needs [Wha, 2014]. Developed countries devote more funds to education, especially education research. In terms of investment in education, Barshai wrote in a 2017 newspaper article that "the world's developed countries are betting heavily on investment in education, betting that a highly educated population will be needed to fill tomorrow's jobs, develop a healthy economy, and generate sufficient tax revenues to support the government" [Barsay, 2017]. All countries have recently significantly increased their funding for education. For example, between 2010 and 2014, education spending increased by an average of 5 percent per student in 35 OECD (Organization for Economic Co-operation and Development) countries. In some countries, it grew at a much faster rate. For example, from 2008 to 2014, education spending increased 76 percent in Turkey, 36 percent in Israel, 32 percent in the UK and 27 percent in Portugal [MacCarthy, 2015].

An interesting factor is that although the budget for education in the United States was limited at the indicated time, the allocation for primary and secondary schools there is higher than in all countries. Barshai also spoke about this in his newspaper column. He wrote that "even with spending cuts, the United States still spends more per student than most countries. In 2014, the United States spent $11,319 per primary school student, compared with the OECD average of $ 8,733 and $12,995 for each high school student, compared with the OECD-wide average of $10,106 per student". On the contrary, the opposite prevails in the countries of the Middle East. Among the top twelve countries with a high level of education, not a single country in the Middle East, although there are some countries in this region among the richest countries in the world.

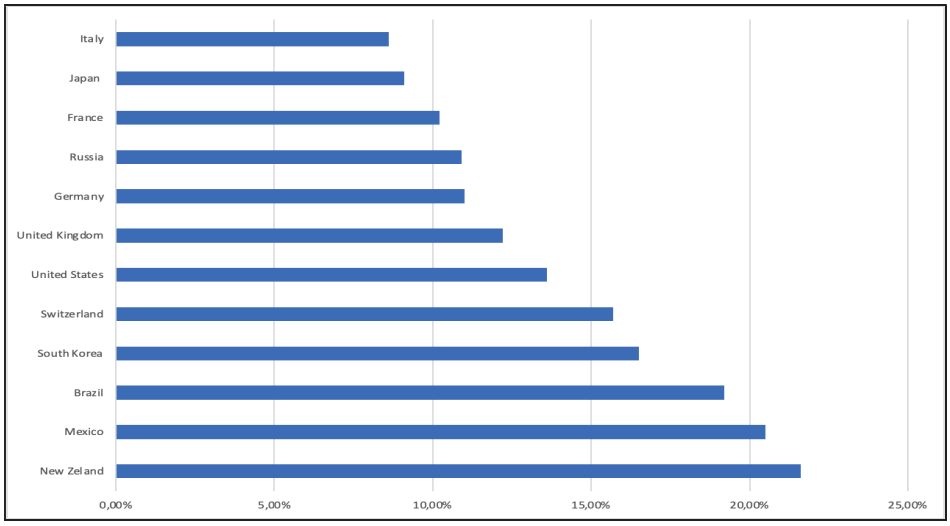

Figure 1. The importance of investment in education for the country
Source: https://www.statista.com/chart/3398/which-countries-invest-the-most-in-education/

Countries in the Middle East tend to place more emphasis on tertiary education than schooling, which is more important for students to have a solid basic education. This wrong move negatively affects confidence, enthusiasm and the necessary knowledge of the subject for study at the university level, as they reveal a large difference between the school system and the structure of university education. According to the Education Performance Index, despite their financial resources, several countries in the Middle East have failed to convert national wealth into expanded opportunities for basic education. Kuwait (54 places lower - pl), Saudi Arabia (48 pl), Qatar (38 pl) and Oman (36 pl) perform poorly in this regard [Akkari, 2004, 144-153].

Methodology. In this research work, both general scientific methods of synthesis and induction, and qualitative methods related to the field of economic science are used. The work used the content analysis of documents related to the research topic. The main information base for this method was international sources and official data from the responsible government agencies of the respective countries. A statistical method of data analysis was used with the development of appropriate graphs for a more convenient presentation of information. The institutional method is also used, which allows us to consider the issue through the prism of understanding the entire system of public administration.

Analysis. In the second half of the twentieth century, education was perceived mainly as an investment in human capital with long-term benefits for both the educated person and society as a whole.

First, in all countries, public funding is considered to be one of the main instruments in the development and expansion of education. During the Industrial Revolution of 1750–1990, the leading manufacturers in the world were the United Kingdom, Germany, France, Russia, Italy, the United States and Japan. In the aforementioned countries, funding for education depended on local, state and federal funding. After the industrial revolution of the 1950s and 70s, spending on education in America skyrocketed [Rosar, Ospina, 2016]. On the other hand, in the case of France, spending on education was initially low and mostly private, then in 1833 funding began to grow from local resources after the passage of a law exempting communes from raising local taxes for schools, and finally in 1881 the year the government took over most of the financial responsibility after the introduction of a new law abolishing all fees and tuition fees in public primary schools.

It is fair to say that the countries of North America and Europe have a larger budget for each fiscal year than other countries. However, data from the World Bank shows that European countries spend more on secondary and tertiary education than on primary. They choose to invest more in early childhood education to strengthen the foundation of their students [Education at a Glance, 2015]. Public preschool education in Europe is

generally more developed than, for example, in non-European OECD countries. Teachers in the Middle East also know that the lack of quality education at the primary level makes it difficult for students to cope with the system at the tertiary level. If the basic education of students is not provided, it is difficult to expect productive results from them at the level of higher education.

The Roser and Ospina treatise states that a percentage of total education spending is contributed directly by households in 15 high-income countries and 15 low / middle-income countries [Rosar, Ospina, 2016]. The charts below also show that both the government and the citizens of a country should take responsibility for funding education rather than relying entirely on government funds.

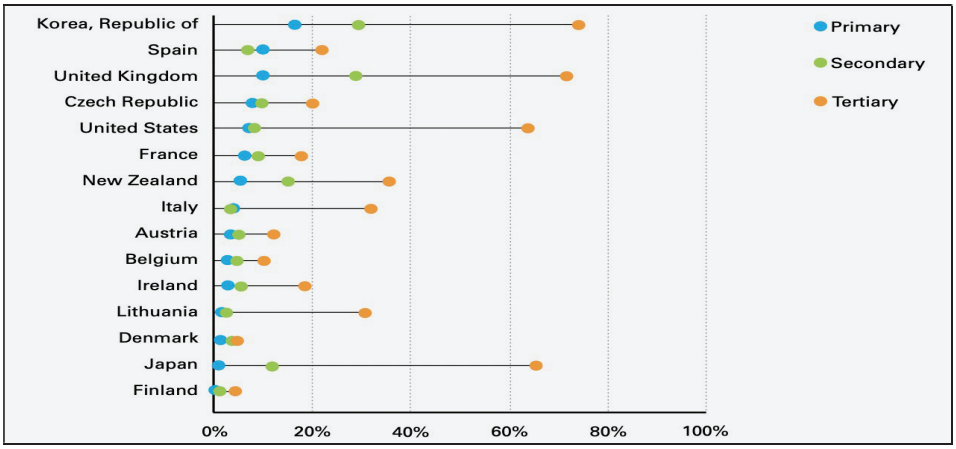

Figure 2. Total spending on education as a percentage contributed directly by households in developed countries

Source:https://www.unicef.org/media/50936/file/Investment_Case_for_Education_and_Equity-ENG.pdf

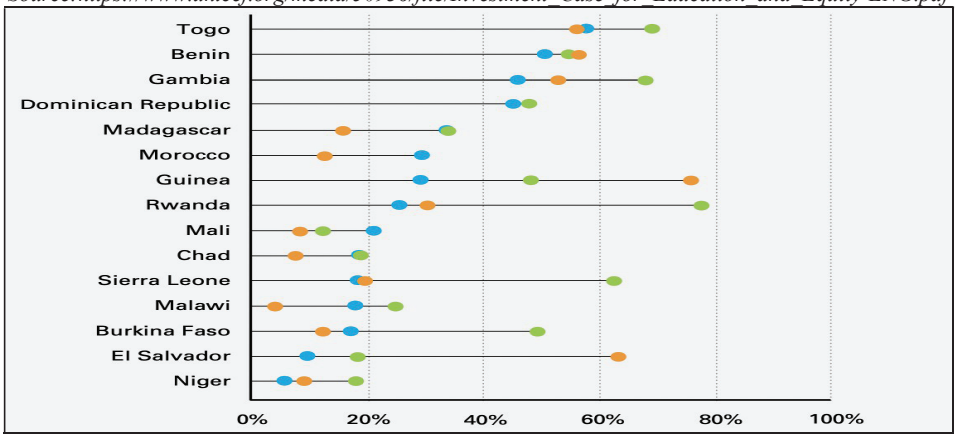

Figure 3. Total spending on education as a percentage contributed directly by households in undeveloped countries

Source:https://www.unicef.org/media/50936/file/Investment_Case_for_Education_and_Equity-ENG.pdf

On the other hand, inadequate investment in education by the public sector results in households paying a significant portion of the cost of educating their children. On a country-weighted average, households in low-income countries account for 27 percent of all spending. Private contributions to education can offset the budgetary gap for public education. If the richest take on the costs, and public resources are mainly used to support poorer and less affluent children, this may even have elements of an equity-focused solution. Figure 4 shows an average household spending in 15 sub-Saharan countries for each level of education. The share of total household expenditures is higher for the second stage of secondary education compared to lower secondary education and for lower secondary education compared to the primary level. However, it is the lowest at the tertiary level at 19 percent of total spending, although tertiary students are generally among the wealthiest.

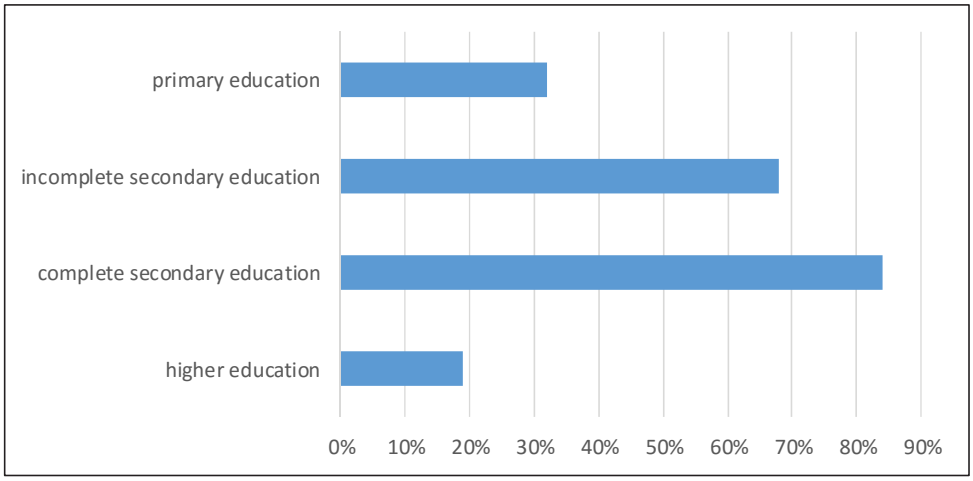

Figure 4. Share of government spending on current education contributed directly by households in 15 countries, 2004

Source:https://www.unicef.org/media/50936/file/Investment_Case_for_Education_and_Equity-ENG.pdf

Parental contributions to education costs include hiring teachers to compensate for the absence of a government-funded teacher. In 2020, 28.5% of teachers in 11 sub-Saharan countries were parent-funded community teachers [Mingat, Jee-Peng. 1996]. Although several countries now publicly subsidize these teachers, many still receive funding from citizens. In low-and middle-income countries, the most common trend is that household contributions to tertiary education are among the most costly investments and where private income from education is highest: for example, 4 percent in Malawi, 7 percent in Chad, and 8 percent in Mali. In 7 out of 15 countries, households 'contribution to tertiary education is lower than households' contribution to primary school, even though tertiary education is available almost exclusively to wealthier students. In some low-income countries where education is almost entirely subsidized by the government,

such as Chad, Madagascar, Malawi and Mali, the majority of primary education spending (18–34%) falls on households due to the lack of prioritization of public resources at this level. Malawi and Madagascar are among the top three countries with the highest concentration of resources for the top 10%. this distribution of private households' contributions to education is the result of highly regressive public funding for education [Leathes, Bonner, Das, Kalra, Wakeham, 2011].

According to Global Finance magazine, in 2018, the top 30 richest countries in the world included 11 countries from Asia, 16 from Europe, two from North America and one from Australia. Of the 11 Asian countries, six are in the Middle East region. Top 30 richest countries listed in Global Finance magazine, according to statistics from the UNESCO Institute for Statistics, there are no data available for Macau, Hong Kong and Taiwan as they are autonomous regions of China. Excluding them, Qatar, Singapore, Brunei Darussalam, United Arab Emirates, Kuwait, Saudi Arabia, Bahrain and Oman are Asian. An interesting fact is that, with the exception of Singapore, all the other richest countries in Asia spend less than 1% of their GDP on research and development. (R&D), and there are fewer than 605 researchers per million inhabitants. Unlike countries that are part of the North America, Europe and Oceania regions, with the exception of Malta, the other seventeen countries invest more than 1.3% of their annual GDP in R&D. In addition, more than 4233 people are researchers per million inhabitants of these seventeen countries. From the above data, it becomes clear that Asian countries are far behind countries in other regions in terms of R&D; even economically unstable Greece is investing more in research, and the number of researchers is larger than in most of the richest Asian countries. This means that Asian countries must focus on R&D for sustainnable economic and educational progress.

On the other hand, in today's globalized world, technology plays a rather large role in research and development in the field of communication and information use, therefore an efficient workforce is required to use technology. With regard to the improvement of modern technology and R&D, it can be said that technologies are generated through investment in R&D, which, in turn, requires the intensive use of a highly educated and intelligent workforce. Consequently, higher education affects economic growth not only directly, but also indirectly - through the creation and development of new technologies [Vila, 2005, 3-10]. After the start of the industrial revolution in 1750, it became apparent that the leading developed countries such as the UK, USA, Japan, Germany, Russia, Italy and others invested extensively in the development of the education sector, since at that time this funding was related to labor productivity.

In 1993, total spending on educational institutions in the United States was 4.2 percent of gross domestic product (GDP) for primary and secondary grades, 2.5 percent for tertiary education, 6.8 percent for all levels combined. Whereas Canada and France

spent more from all G-7 countries on primary and secondary education. Canada alone spent more than the United States on higher education and all levels together [International comparisons of expenditures for education, 1997]. It is also now clear that investment in education in developed countries is higher than in other countries.

Conclusion. However, colossal investments in education cannot accurately guarantee quality education, for example, despite the fact that the countries of the Middle East annually invest quite significant funds in higher education and have a decent budget for education, they still make a small contribution to the development of the education sector in the world. level. A well-thought-out plan, targeted education spending and the efficiency of the existing education system play a decisive role here. Supporting this problem, it can be noted that the indicators of a country in the development process are closely related to the effectiveness of the education system [Sezer, Mercan, 2014, 925-930]. In addition to several positive contributions to the social, cultural and political spheres, an effective education system increases competitiveness and fosters economic growth by training a skilled workforce and increasing economic productivity.

The most important advantage of developed countries is that they have the potential for a well-educated and skilled workforce that keeps pace with rapid changes in manufacturing and high-tech productivity. Raising the level of education has a positive effect on economic growth, increasing both labor productivity and the ability to acquire new knowledge. The quality of education in a country significantly affects the overall ranking of a country. We may conclude that the country's rating derived from indicators of the quality of education is made up of the following factors:

- investment attractiveness;
- economic growth;
- per capita income;
- the level of poverty;
- positive balance of migration flows;
- low level of the shadow economy
- etc.

For example, according to the US News & World Report 2018 education ranking, the top 30 countries include 22 countries from Europe, two from North America, two from Oceania, and four from Asian regions. This is practically reflected in other industries. Among the top 30 countries in the world in terms of education, 93.33% (29 countries excluding Belgium) are among the top 30 countries in the overall ranking. In addition, 76.67% (23 countries) of the aforementioned countries are among the 30 most influential countries in the world. Also 83.33% (25 countries) of these countries are among the 30 most progressive-minded countries.

In developed countries of the world with more funding in education the crime rate is lower and people have more decent lifestyle. Also, more education means more job opportunities, which leads to less crime. In addition, it can be argued that large investments in education are associated with greater stability of social structures [Vila, 2005, 3-10]. School helps children understand social values and encourages them to behave in a socially acceptable way, so educated people are expected to be more civilized and tolerant of others. Educated communities tend to be more stable and less prone to violent social conflict than societies with less educated populations. This atmosphere prevails in countries such as Finland, Canada, Norway, Denmark, Switzerland, Sweden, etc.

Diversification is a guarantee of a confident future, as the main tool for minimizing risks. Investment in education must be diversified to balance education development as it impacts sustainable economic growth across sectors. It should cover incomplete, secondary and higher education, as well as medical, technological, mechanical, scientific and social education. All of them must be linked to general social, environmental and cultural development. In addition, all of these advances need to be updated from time to time to meet global needs. Diversified investment in education will also cover the needs of the domestic and international market. It can be patronized by governmental and non-governmental organizations that are associated with the economic and educational goals of the country. The result of funding education can be reflected over several years or decades. In this regard, Emily Hu talks about investing in education to provide quality education in the United States. She believes that "well-established standards and authoritative systems for assessing the quality of education in the United States are key to their global leadership in the education of children under 12 and their ability to attract diversified investment in this and other sectors" [China's K-12 Schools embrace a diversified capital investment era, 2016]. Diversified investment in education and interdisciplinary education also reduces economic risk. China has taken initiatives to develop multidisciplinary talent as a top priority and key to allowing the broadest range of high quality social resources to flow into education, to foster innovation in education.

Since the quality of education, development and country influence are parallel processes, the following steps should be taken before thinking about investing in education.

The quality of education does not mean an influx of money; if it were possible, resource-rich countries would have the best schools, universities, research institutes and researchers. The following points should be carefully considered before funding:

- enthusiasm,
- research environment,
- research fund,
- transparency,
- investment of money,

- search for loopholes in the education system,
- in-depth knowledge of current world circumstances,
- the efficiency of using the latest technology and not just buying them.

To be successful, the development strategy and long-term vision of the country must be kept in mind before funding the education sector. In fact, the benefit of investing in education is finally reaching the students. So, we need to create a hardworking, knowledgeable, curious and talented generation to get the optimistic end result of this support. Policymakers should consider that this is a long-term investment; it may take several decades to see the results of this funding. Singapore is a good example here.

In the 1980s, Singapore's economy began to flourish and the emphasis in Singapore's education system shifted from quantity to quality. A lot of differentiation was made for students with different academic abilities, for example, the modernization of vocational education within the framework of the new Institute of Technology and the division of the general stream in secondary schools into academic and technical streams. The Gifted Education Program is also designed for more academically inclined students. In 1997, Singapore's education system began to transform into a capacity-based education system after then Prime Minister Goh Chok Tong outlined his vision of "schools of thought, learning nations." This policy put more emphasis on national education, creative thinking, collaborative learning, and ICT literacy.

We may conclude that interdisciplinary education is funded, and the transformation of education, based on this and human nature, is endless. In today's digital world, this is happening rapidly. After five years, the government authorities should revise the school and university education system; books and course plans should be reviewed for updates. Therefore, constant investment is required here. If students graduate from updated and time-based courses, it will create an efficient workforce that will make a lasting contribution to the country's economy. If the country's economy thrives, the labor market will expand, and eventually. the problem of unemployment will be reduced. Economic analyzes aimed at examining the value of education focus on the contribution of formal schooling to improving the ability to earn money in the labor market. Longer schooling increases your chances of finding a job [Sezer, Mercan, 2014, 925-930], reduces the duration of unemployment and positively affects incomes due to higher earnings in the labor market [Vila, 2005, 3-10].

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Analysis of international experience in financing education

Key words: education, budget, economic development, universities

Everyone knows that education is the foundation of a nation. Countries that have implemented this motto and have long invested heavily in the sustainable development of the country's education sector are now leaders in innovation, global influence, employment, innovative thinking, world-class healthcare, technology, ideological influence and even in the military. They diversified investment in education, which spurred progress across all sectors. On the contrary, there are many countries that rely on some specific advanced countries for creativity, education and even making important decisions. These countries cannot support their own sustainable development because they rely on others. In addition, some countries are highly dependent on natural resources, which currently face constraints due to the sharp fall in the prices of these assets due to the global economic depression or the invention of alternatives. The world's best educated countries have more researchers, a diversified world-class education system, and the creativity to cope with changing global circumstances. Thus, funding for education opens up many employment opportunities, which leads to a decrease in the crime rate in the country and, as a result, leads to the sustainable economic development of the nation.

QUANTITATIVE ASSESSMENT OF CREDIT RISK

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Key words: risk, assessment, probability distribution, distribution density, interest rate, profit

Introduction. Risk classification is one of the main functions of banking activities, as their precise structure and grouping make the planning and forecasting process more efficient. Comprehensive classification of bank risks is important on the assumption that it provides an opportunity to model and regulate banking activities, conduct a comprehensive research of internal reserves, as well as increase the efficiency of operations. It also allows to free the key performance indicators of the bank from the impact of externalities, increasing the accuracy of managerial decisions.

Currently, the hierarchical system of banking risks has a fragmented and improper structure, which is primarily conditioned by the diversity of approaches to measuring banking risks and the availability of different approaches to coordination.

Scientific novelty. The scientific novelty of the work the proposed model, which allows to assess the credit risk based on the probability distribution density function of the provided loans, according to the different scenarios of the strategies chosen by the bank. Taking into account the issue of the unified approach to the classification of the nature of the risks, the factors of origin and the source of origin, it becomes vital to take steps to create a comprehensive methodology.

The model presented in the work makes it possible to assess credit risk in case of different distribution functions as well as its sensitivity to changes in various parameters.

Literature review. Currently there are about 40 risk classification indicators, and still more than 220 types of risks typical of banking activities are being observed [Kadzho, 2015, 51]. One of the outstanding researches on the classification of banking risks is N. Sokolinskaya's work titled as "Economic Risks in Commercial Bank Activities" [Sokolinskaya, 2000]. It highlights criteria that have not undergone significant changes over time as a result of the development of banking risk theory. One of the disadvantages of this approach is the lack of risk sharing in accordance with their importance, also the relationship of risk to different groups and the impact on each other are not shown and the elements of the classification are eclectic. The strengths of the author's classification are the systematic approach to risk analysis, the need to manage banking risks through a combination of known tools over time and space, the gross banking risk calculation algorithm and the urgency to develop banking risk theory [Sokolinskaya. 2000].

V. Sevruk classifies risks, including banking risks, in the financial sector, since "the efficiency of the financial sector of the country's economy has a decisive impact on the activity of the economy as a whole." According to V. Sevruk, the complexity of risk classification is explained by their diversity, as well as by the emergence of new types of risks as a result of economic, social and technological development of the modern world [Sevruk, 2001]. The classification of external risks proposed by V. Sevruk is more comprehensive [Sevruk, 2001, 9-33], as it emphasizes the risk of the country, the risk of foreign exchange, the risk of natural disasters, etc.

M.I. Bakanova, I.O. Spitsina, O. Ya. Spitsina, IT Balabanova, N.E. Sokolinskaya and other scholars offer their own versions of risk classification. Here the main risks include credit risk, market risk, interest rate risk, liquidity and imbalance risks, profit loss and insolvency risks. Additional risks are inflation, currency, political and abuse risks.

J. F. Sinki [Sinki, 1994, 937], considering the analysis of the balance sheet of the credit institution, distinguishes three main groups of banking risks: *portfolio* (credit, interest, foreign exchange, liquidity and capital management) and *off-balance sheet risks, regulatory risk,* delivery risk (technological, affiliation, current efficiency, strategic risk). German Economists P. Welker and B.Oldesloe distinguishe two groups of banking risks: non-payment risks and price risks. [Alisheykhova, 2006, p.15-17] distinguishes five types of banking risks: credit, liquidity, interest rate risk, operational risk, capital risk (probability of bank insolvency).

The probability of not achieving the goal can probably be considered the most successful definitions of risk amongst many existing ones, but mathematical expectation of the expected result and dispersion are often used in practice. Moreover, the last two methods of risk assessment cannot be considered sufficiently justified. Of course, it is not perfect to measure risk with the probability of not achieving the goal, especially if it is formally perceived, then, for example, achieving the goal by 99% will formally mean that we have not achieved the goal. In many cases, being close enough to the goal can also be considered achieving the goal, for example, if that goal was to achieve a certain standard of living, then achieving it by 99% can also be considered a complete success, although we did not achieve the goal from a formal point of view.

Research methodology. Toolkit of probability theory, modern systems of risk classification and management strategies are implemented in this work. Particularly, issues such as distribution density function of random variables, their numeric character and distribution function, the concept of function of random variables, mathematical methods and models of quantitative risk measurement and assessment, as well as modern risk classification systems used to conduct research in the field of risk theory, several possible types of credit policies needed to manage them in conditions of uncertainty are touched upon in the current research.

Analysis. The use of linear models, as well as models based only on the assumption of normal distribution, are usually applicable in cases where the system is operating in constant conditions. The interdependencies between the elements of the model object are constant over time and are not subject to the impact of various factors. However, most of the variables included in the mathematical model are random variables or functions that may change over time. When evaluating the impact of external parameters or factors on a model object, only their probability characteristics should be considered. Besides, the complex relationships between the parameters of the modeling system are not linear; their linearization leads to a discrepancy between the object and the model, therefore the results obtained are not able to accurately express the real patterns in advance. It is therefore necessary to develop such methods that will take into account the probability nature of the variables in them and their actual dependencies. As a rule, in complex systems the decision is made in conditions of partial or complete uncertainty, therefore the expected results cannot also be completely determined, i.e. their receipt is associated with a certain risk, the existence of which depends on the probability nature of externalities, as well as the incomplete determination of the processes in the current system. In the professional literature known to us, there are only vague approaches or hints about getting possible credit risk assessments. In some ways it is recommended to use the average value of expected profit (or mathematical expectation) or the expected profit dispersion (or average squared deviation from the mean) as criteria for quantitative risk assessment [Sevruk, 2001].

We think that these assessments can not fully represent the reality, as they provide little information about the financial and credit policy of banks. Thus, it is necessary to develop a new probabilistic approach to measuring the risk involved in decision making. Below we present a generalized method of solving the above-mentioned problem, which can have both practical and versatile application.

1. Mathematical analysis of statistical data on the amount of loans provided by commercial banks to enterprises and households shows that the figure of loans, as random variables, are subject to the exponential law of probability distribution [Sevruk 2001].

$$F(x)=1-e^{-\frac{x}{T}} \qquad (1.1)$$

where x is a random variable expressing the amount of provided loans, T is the average loan amount, which will be called the bank's loan constant. The differential law of probability distribution (or the probability density function) will be

$$f(x)=\frac{1}{T}*e^{-\frac{x}{T}} \qquad (1.2)$$

The compliance of this law and statistic data was verified by Pearson χ^2criterion and a high probability of their compliance is obtained (P>0.9):

So, based on the probability distribution function of the loans and the probability density function (PDF), the following approach can be proposed for risk assessment.

2. Let's consider banks' credit policy formalization as a transformation of x-amount credit, which turns it into Q profit in the current economic climate and is also considered a random variable. Meanwhile, it can be admitted with great accuracy that the amount of profit received due to financial and credit activities of the bank is directly proportional to the amount of the loan [Sevruk, 1996, 72], i.e.

$$Q(x) - \begin{cases} 0, & x > 0 \\ k * x, & 0 < x < x_{max} \\ 0, & x > x_{max} \end{cases} \qquad (1.3)$$

where x_{max} is the largest possible loan amount provided by a bank, k is the average annual interest rate on loans. The formalized scheme of profit generation is as follows (Figure 1).

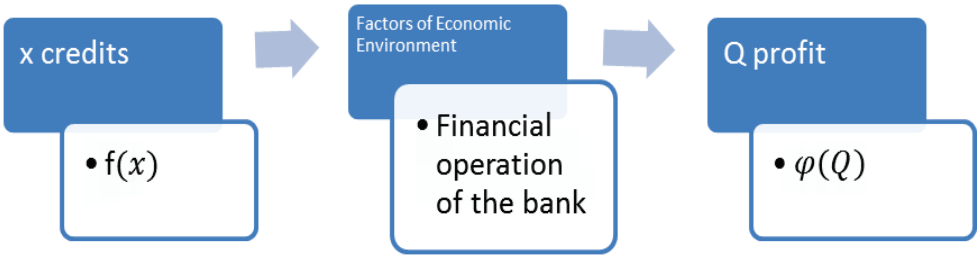

Figure 1. Profit generation scheme

Let's assume that the variety of possible solutions is a positive, continuous random variable with a probability density function (PDF) f (x). Suppose that the decision x makes a result of Q (x), for example, profit. Generally speaking, Q (x) result indicator is also a continuous random variable with a function φ (Q) of its hitherto unknown probability distribution density. For a particular system under observation, it is always possible to determine the pattern of Q (x) output obtained as a result of the decision made. To carry out quantitative risk assessment within the decision made, we propose to calculate the probability of the occurrence according to which Q of the expected outcome would be smaller than the desired Q_0 level given in advance, i.e. $P(Q < Q_0)$, or Q variable would be in a certain undesirable range (Q_1, Q_2), i.e. $P(Q_1 < Q < Q_2)$.

Thus, for quantitative risk assessment, the following formulas are obtained in the first and second cases respectively:

$$R = \int_0^{Q_0} \varphi(Q)dQ \qquad (1.4)$$

$$R = \int_{Q_1}^{Q_2} \varphi(Q)\,dQ$$

To apply the formulas in practice, it is necessary to find the function of the random distribution density Q (x), which in turn depends on the random quantity x of the probability distribution variable f (x).

As we have already observed [Ekonomicheskaya bezopasnost, 2001], the nature of the law f (x) does not change in the case of a linear change in the *x* variable, so the function φ (Q) will be exponential.

The solution to this problem is already known and, by following example [9], the function φ (Q) would be:

$$\varphi(Q) = |f[\psi(Q)]| * \psi'(Q) \qquad (2)$$

where ψ (Q) is the inverse of the Q (x) function of obtaining the output index.

Let's observe the quantitative risk decision by the example of the bank's credit risk, considering that it pursues a fairly cautious credit policy, which is one of three possible strategies:

fairly cautious

moderately cautious

relatively courageous

As it has already been mentioned, research [Venttsel, 1974] shows that in case of a fairly cautious credit policy, the amount of loans provided has a probability density distribution function.

$$f(x) = \frac{1}{T} * e^{-\frac{x}{T}} \quad , x>0 \qquad (3)$$

where *T* is the average loan amount variable.

As it has already been mentioned, in the case of a simple, linear representation of the output Q (x), which is typical of bank's loan operations, the following occurs:

$$Q(x)=k*x \qquad (4)$$

where *k* is the average interest rate on the loan.

From (3) we can get the inverse function ψ (Q) and its derivative.

$$\psi(Q) = \frac{x}{k}, \qquad \psi'(Q) = \frac{1}{k} \qquad (5)$$

Taking into account (2) and (5), the function of density distribution **φ (Q)** can be obtained in the case of cautious credit policy.

$$\varphi(Q) = \frac{1}{T*k} * e^{-\frac{Q}{T*k}} \qquad (6)$$

Via formula (6) we get the probability or risk that the result index **Q (x)** will be below a certain desired level of **Q_0** given in advance, as we defined it as a quantitative-probability risk assessment of the decision made.

$$R = 1 - e^{-\frac{Q_0}{T*k}} \qquad (7)$$

Thus, the variable of the profit is subject to the exponential law of probability distribution, i.e. **M (Q) = k * T** by mathematical expectation.

As a final result, we can assess the risk by the expected profit of mathematical expectation and dispersion, using formula (7) and calculating the dispersion by the following final expression (8).

$$D(Q)=(T-1)^2 \approx T^2 \qquad \sigma(Q)=\sqrt{D(Q} \approx T \qquad (8)$$

For quantitative risk assessment, according to law (6), a number of problems of theoretical and practical value can be solved, for example, to determine:

- $P(Q > Q_0)$ and $P(Q < Q_0)$ probabilities
- P (Q <T) probability of receiving less than average profit
- the average interest rate at which $Q=Q_0$ in case of R risk
- $P(Q_1 < Q < Q_2)$ probability, etc.

Conclusion. The approach to quantitative assessment of credit risk discussed in this article is interesting in respect that in case of different functions of crediting volumes and expected profit, it would be possible to calculate the credit risk and its sensitivity to changes in various parameters according to the strategy chosen by the bank.

The scientific novelty of the work is summarized in the proposed model, which allows to assess the credit risk based on the probability distribution density function of the provided loans, according to the different scenarios of the strategies chosen by the bank.

The end results of the work are conditioned by the fact that credit volumes are random variables of exponential distribution, but the above discussed approaches can also be applied in case of arbitrary distribution of credit volumes and to obtain formulas for calculating risk or other equivalent indicators.

In a nutshell, the presented approach can be used to quantify the risk in different situations and fields.

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Quantitative assessment of credit risk

Key words: risk, assessment, probability distribution, distribution density, interest rate, profit

Currently, various mathematical methods and models are used for quantitative assessment for risks, most of which are linear, as in case of nonlinear models normal distribution of random variables is assumed. This approach, in our opinion, significantly devalues the model, since other distributions of random variables that change over time are more common. It is known that the financial and credit policy pursued by banks in connection with large investments is carried out in conditions of certain risks. As a result, we come to a situation where there is some degree of uncertainty, when the expected return on bank investment in a loan portfolio is a random variable or random function. In such conditions, the development of new methods of quantitative analysis and assessment of the risk contained in the financial operations of a bank is becoming a very urgent problem, the solution of which will allow financial institutions to estimate in advance the likelihood of obtaining the expected profit, or calculate estimates of other equivalent indicators. In this article tools of probability theory were used as well as modern risk classifying systems and management strategies. Thus, the presented approach can be used in decision making in different conditions and fields for quantitative risk assessment.

EFFECTS OF INNOVATION LINKAGES IN THE CONTEXT OF NATIONAL INNOVATION SYSTEM DEVELOPMENT[1]

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Key words: national Innovation System, Innovations, Innovation Linkages Index, Global Innovation Index, Triple Spiral Model, Clusters

Introduction. Studies aimed at creating an innovative economy in Armenia and other countries of the former Soviet Union gained momentum during the transition to a market economy. Despite the different policies and tools used, the results are still not enough. One of the reasons is the existing problems in the field of operation of the national innovation system.

The guarantee of effective operation of the national innovation system is the existence of links between the various components of the system. The analysis of the latter is aimed at the study, within the framework of which the level of innovation linkages in the world, in Armenia, as well as in other EEU member states and neighboring countries of the Republic of Armenia has been studied. The level of innovation connections in general was studied, as well as according to the different directions of those connections. During the research, detailed reference was made to the "university-industry" cooperation in terms of research and development in different countries, the depth of development of innovation clusters, the depth of funding for research and development in foreign countries. Providing a high level of these three components allows the development of a national innovation system, which should contribute to the smooth transition to an innovative economy in the country. On the other hand, the analysis refers to indicators such as the number of transactions made for joint ventures or strategic alliances (Per Billion PPP$ GDP), as well as patent families (Per Billion PPP$ GDP). In fact, if it is possible to ensure the high level of work of these 5 components, a more developed and flexible system of innovative connections is provided. As a result of the research, some conclusions have been made, which aim to further strengthen the national innovation system of Armenia in terms of ensuring a higher level of innovation linkages.

Methodology. 6 indicators were included in the research. Based on the data of the World Intellectual Property Organization, the Innovation Linkages Index and 5 sub-indices describing the latter (University-industry R&D collaboration,

[1] The study was conducted with the financial support of the Committee on Science of RA MoESCS within the framework of a scientific topic under the code 21T-5B313

State of cluster development and depth, GERD financed by abroad, % GDP, Joint venture/strategic alliance deals (Per Billion PPP$ GDP) and Patent families (Per Billion PPP$ GDP) were observed. All indicators are presented as of 2021 and comparisons of indicators change compared to 2020 levels have been made. The study included the top three countries among 140 countries by the level of innovation linkages, cluster development level and depth sub-index. To the monitoring of the above-mentioned indicators in Armenia was given special importance. On the other hand, the indicators were observed in other EEU member states and in Armenia's neighboring countries: Azerbaijan, Georgia, Turkey, Iran. During the comprehensive research conducted in the mentioned countries, numerous diagrams were widely used to show the existing differences visually and practically.

Literature review. Since 1980, a number of scientists-economists have been studying the issues of formation and development of the national innovation system. The founders of these directions are C. Freeman, B. Lundwall, R. Nelson, and S. Metcalfe [Bondarenko, 2018, 4]. There are many definitions of a national innovation system. This diversity - once again represents the complexity of the system and its dynamic nature. According to one definition, a national innovation system is a network of public-private sector organizations whose interaction promotes, introduces, modernizes, and disseminates new technologies [Freeman, 1995, 5-7]. In this definition one can pay attention to the term "interaction".

There are numerous studies, rich economic and modern literature on the national innovation system, its separate components and their interaction. In particular, C. Freeman in his study "Technology policy and economic performance. Lessons from Japan» [Freeman, 1987, 38-66] notes that the study of the structure and work processes of already formed and operating national innovation systems in developed countries shows that there are serious differences between countries, which correspond to their cultural, technological, socio-economic characteristics. In his work "Towards the fifth-generation innovation process" R. Rothwell [Rothwell, 1994, 7-31] introduces model of national innovation system development from the linear process to the triple spiral. As stated in N. Smorodinska's "Triple Spiral as a New Matrix of Economic Systems" article [Smorodinskaya, 2011, 66-78] the triple spiral model is a network interaction of three participants (science, state, business) in a hybrid social structure.

As stated in Y. V. Danilina's article "Problems of Balancing the Integration of Institutions of National Innovation Systems of the Russian Federation" [Danilina, 2018, 63-67] the problems of incomplete functioning of national innovation systems are due to insufficient interactions or connections between participants in innovation processes. Mo-

reover, weak innovation linkages prevent forming a complete chain from the idea to its realization in the market. The lack of an information communication environment is emphasized, in which it would be possible to carry out effective coordination and not only vertical, but also horizontal connections establishment.

Analysis. For the full and effective operation of the country's innovation system, it is necessary to ensure a viable level of innovation linkages. In this regard, it is important to understand the level of development of innovation linkages in different countries of the world.

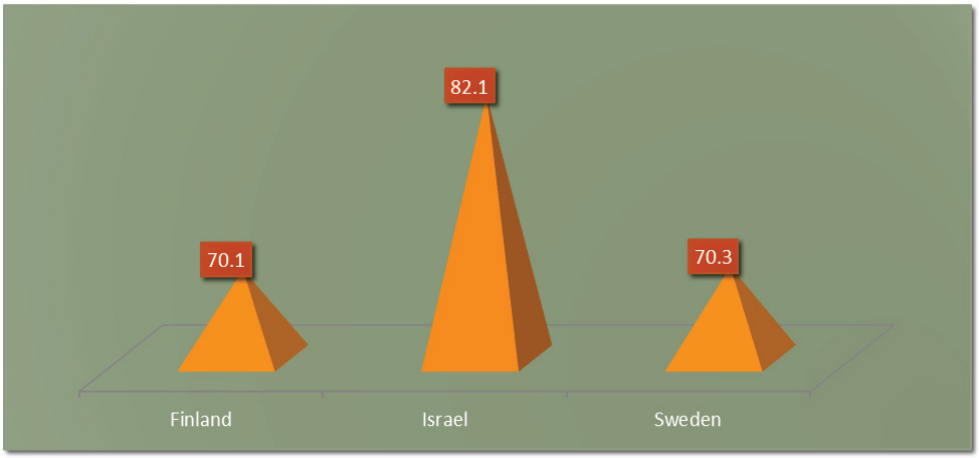

Figure 1. Innovation Linkages Index in Israel, Finland and Sweden in 2021
[Source` Indicator Rankings & Analysis | Global Innovation Index]

According to statistics, in 2021, the first three places in terms of innovation linkages were occupied by Israel, Sweden and Finland, respectively. Israel scored 82.1 points in the Innovation Linkages Index, while Finland and Sweden scored 70.1 and 70.3 respectively. The innovation linkages of Israel and Finland have improved by 0.5 and 1.6 points, respectively, compared to 2020. In Sweden, the index decreased by 5.9 points. Why have these countries taken the lead? To answer this question, for each of the top three countries, it is necessary to consider the levels of the innovation sub-indexes as of 2021. Note that, for example, Israel has provided the highest level of foreign-funded domestic expenditure on research and development / GDP ratio. The latter was registered in 2021 at the maximum level of 100 points. Israel provided a high score for patent families, providing a score of 93.3. Sweden and Finland are the leaders in the index of patent families, which has been set at 100 in both countries. Examining the available statistics, we notice that the countries occupying the first three places have registered very low levels in terms of the state of development of the clusters and depth.

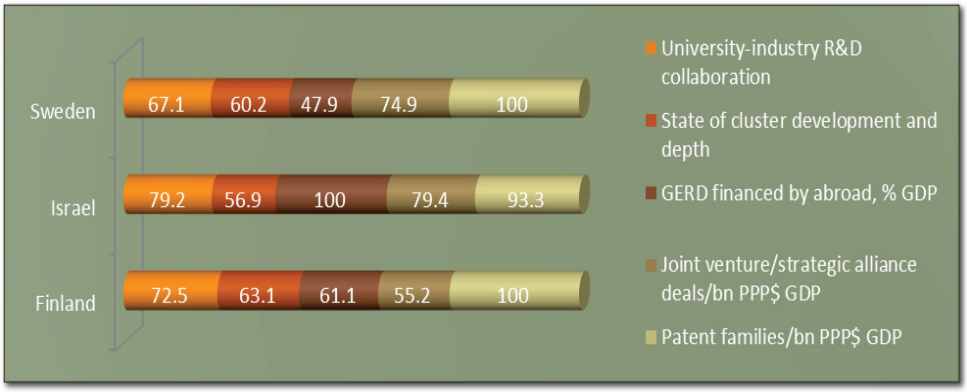

Figure 2. Innovation Linkages Index sub-indexes in Israel, Finland and Sweden in 2021
[Source` Indicator Rankings & Analysis | Global Innovation Index]

In particular, in 2021, Israel ranked only 32nd out of 140 countries in terms of depth of cluster development, with a score of 56.9. Finland and Sweden ranked 19th with 63.1 points and 25th with 60.2 points, respectively. Let's study the countries that have the best results of cluster development, depth and occupy the first, second and third place.

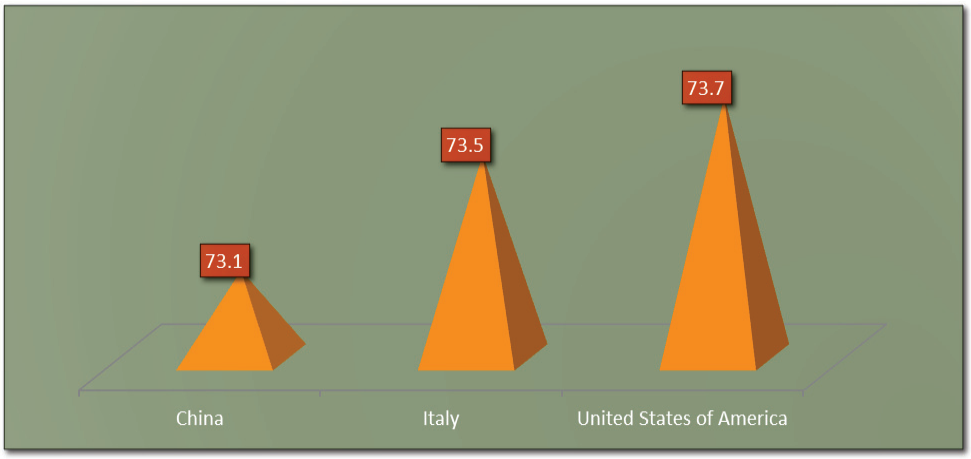

Figure 3. State of cluster development and depth sub-index in USA, Italy, China (2021)
[Source` Indicator Rankings & Analysis | Global Innovation Index]

The first place by the sub-index of the state of cluster development and depth belongs to the USA, where in 2021 the index result of 73.7 points was registered. It should be noted that the United States ranked 6th in terms of innovation linkages. Italy is in the second place at the level of 73.5 points. Italy ranks 27th in terms of innovation linkages. The third place belongs to China. In 2021, the latter ranked only 32nd in terms of the index of innovation linkages, and the third in terms of the depth and development of the clusters with a score of 73.1. China has made significant progress in state of cluster

development and depth. The index has increased by 13.5 points in 2021 as compared to 2020. The United States and Italy, on the contrary, had a setback.. The index has decreased by 1.1 and 1.4 points compared to 2020, respectively. Armenia still has a lot to do in terms of innovation linkages.

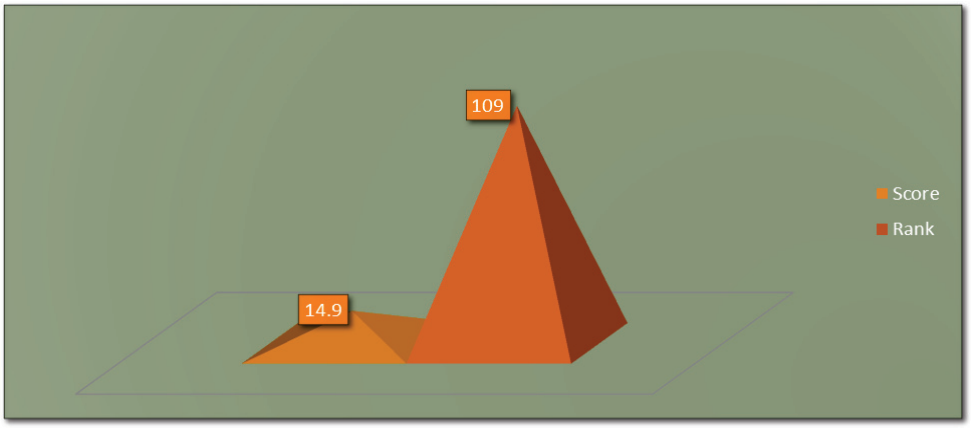

Figure 4. The score and the rank of the Innovation Linkages Index in Armenia in 2021
[Source` Indicator Rankings & Analysis | Global Innovation Index]

Armenia ranked 109th among 140 countries in 2021 by the index of innovation linkages, and the score of index of innovation linkages was 14.9. Compared to 2020, the score of the index of innovation linkages in Armenia has decreased by 1.3 points. As a result, Armenia has moved from the 101st position to the 109th position in terms of this indicator. Let's study the behavior of the components of innovation linkages index in Armenia.

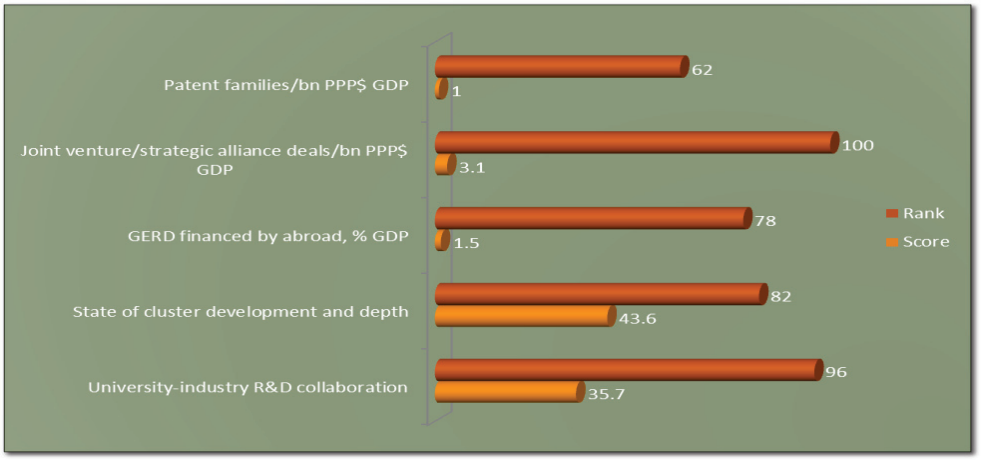

Figure 5. The score, the rank of sub-indices of Innovatiion Linkages Index in Armenia
[Source: Indicator Rankings & Analysis | Global Innovation Index]

As of 2021, Armenia was the 62nd by the index of patent families, which is a rather good result in comparison with the other components of the innovation linkages index. The worst situation is in terms of the number of joint ventures/strategic alliances (Per Billion PPP$ GDP). In terms of this indicator, Armenia is ranked 100th. It is also a difficult situation in terms of University-industry R&D collaboration sub-index. As of 2021, Armenia ranked 96th in terms of this index with a score of 35.7. In order to build a sustainable innovation system, it is very important to understand the reasons for the low level of innovation linkages from all sides. With regard to the latter, let us consider the geographical position of the Republic of Armenia, which can also be the reason for the low level of innovation linkages in a certain way.

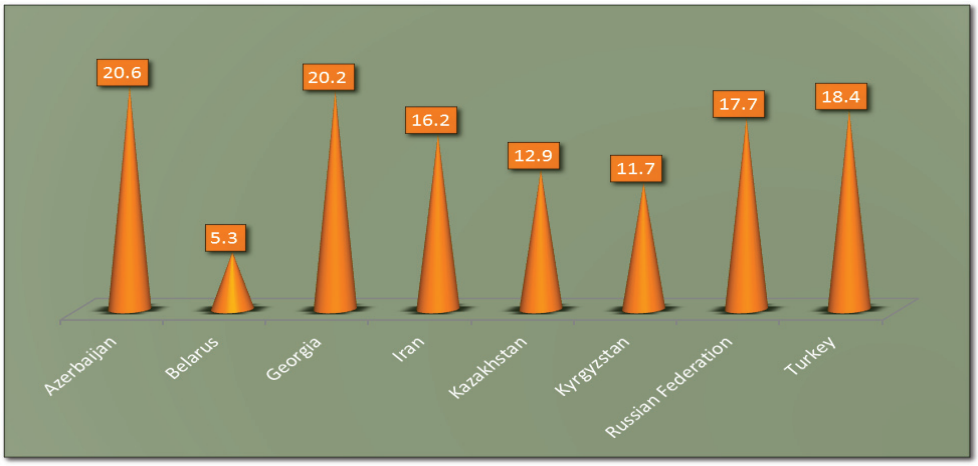

Figure 6. Innovation linkages index in the neighboring countries of Armenia and in the EEU member states in 2021

[Source: Indicator Rankings & Analysis | Global Innovation Index]

Azerbaijan, Georgia and Turkey have registered good results in terms of the index of innovation linkages from our neighboring and EEU countries. As of 2021, Azerbaijan ranks 66th in terms of innovation linkages with a score of 20.6, which is an increase of 0.5 points compared to 2020. The second place in the region belongs to Georgia, which is ranked 68th out of 140 countries, with a result of 20.2 points, which has increased by about 4 points compared to 2020. Turkey is in the third place which ranked 79th with 18.4 points. The latter has increased by 1 point compared to 2020. The situation in Belarus is difficult, as in 2021 the index of innovation linkages recorded 5.3 points, occupying the 128th place. In terms of innovation linkages sub-indexes both in the EEU member states and the neighbouring countries of Armenia have registered the following results. Let's pay attention to the fact that Azerbaijan, which has registered quite serious results in terms of innovation linkages index, is ranked 23rd in terms of research and development in the university-industry cooperation sub-index with a score of 59.5. In addi-

tion, it ranks 27th among 140 countries in terms of cluster development and depth. The situation in Azerbaijan is difficult in terms of expenditures on foreign-funded research and development. In terms of this index the country is in the 100th place. In the case of Belarus, there is a low level of all sub-indicators of the innovation linkages index .

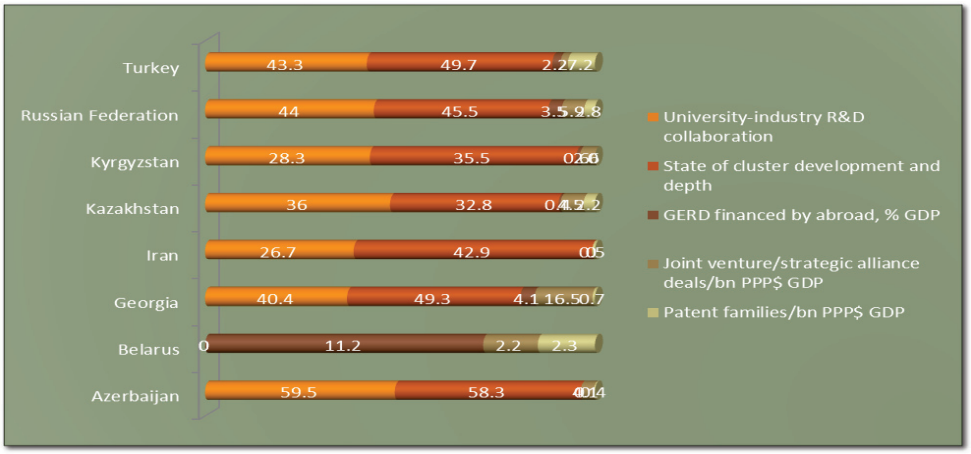

Figure 7. Level of Sub-Indices of the Innovation Linkages Index in Armenia's Neighboring Countries and EEU Member States in 2021
[Source` Indicator Rankings & Analysis | Global Innovation Index]

Scientific novelty. In the research, the basis for the effective operation of the National Innovation System is the level of development of innovation linkages. After comparing the countries with the best results in the Innovation Linkages Index by 2021, a transition is made to those countries with the highest level of cluster development. After reviewing the analyzes of a number of researchers in this article, a study of the Innovation Linkages Index, including its sub-indices, was conducted specifically for Armenia. During the analysis, the study of the reasons for the innovative connections and the changes in its components in the context of the peculiarities of the geographical location of Armenia was especially used. For this purpose, the dynamics of innovation linkages and its components in the RA neighboring and EEU member states were studied.

Conclusions. As a result of the analysis, it became clear that one of the most important components of the establishment and operation of the national innovation system is the provision of strong links between the elements of the system. One of the Global Innovation Index sub-indices, the Innovation Linkages Index, was used to describe the current state of these links. It turned out that as of 2021, the first three places in terms of innovation linkages were occupied by Israel, Finland and Sweden among 140 countries. However, even in leading countries, the provision of innovation linkages is not going smoothly. During the analysis it became clear that in these countries there are problems with the level of cluster development. Within the framework of the work, the countries

that are not in the first places in terms of innovation linkages, but they occupy significant positions at the level of cluster development were observed. Those countries are the USA, Italy and China.

Within the framework of the conducted research, special reference is made to the level of innovation linkages in Armenia. We state that Armenia is quite behind with this index, there is a lot of work to be done. Even tax incentives for the development of national innovation systems can also provide the enabling environment necessary for linking the relevant components of national innovation systems. In the case of Armenia, not only the current state of innovation relations was recorded, but also the level of development of its components was studied in detail. It was proved that as of 2021, there is a low level of the formation of joint ventures and strategic alliances. In terms of this index, in 2021 Armenia took the 100th place among 140 countries. Overcoming the existing obstacles in terms of innovation linkages in the establishment of the RA national innovation system should be a priority. Understanding the region, the geopolitical situation in which Armenia found itself, the current state of the latter's level of innovation linkages, the further course of its development is also connected with the level of development of innovation linkages with Armenia's neighbors and EEU partners. Based on this circumstance, the current situation of innovation linkages and its components as of 2021 with regard to the neighbours of the Republic of Armenia and EEU member states has been considered.

During the research, it was found out that Azerbaijan has a leading position, ranking 66th among 140 countries in terms of innovation linkages. The situation in Belarus is difficult. The latter took the 128th place. Examining the components of innovation linkages, we came to the conclusion that there are problems in Azerbaijan that have a direct impact on the further development of the country's national innovation system. As a result of the analysis, it became clear that the level of the Innovation Linkages Index in Armenia and existing problems in it almost repeat the existing problems in terms of the components of the innovation linkages and its components of the other EEU members and neighbouring countries.

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7. Indicator Rankings & Analysis | Global Innovation Index

Harutyun TERZYAN, Andranik MARGARYAN

Effects of Innovation Linkages in the context of National Innovation System development

Key words: National Innovation System, innovations, Innovation Relations Index, Global Innovation Index, triple helix model, clusters

The national innovation or innovation system is of central importance for the development of the innovative economy of the country. As a result of the smooth operation of all components of the system, the entry of innovations into the country is carried out more smoothly and efficiently. However, the work of individual components of the national innovation system is not enough to ensure the stability of the system. Numerous research economists have drawn attention to the connections between the individual components of the national innovation system. The effectiveness of the national innovation system depends on the level of their development. In this regard, this study examines the interconnection and mobility of innovative connections and its components in the global and regional context. The article analyzes innovative connections in the context of the dynamics of the global innovation index changes in the indicator and comparisons are made at the level of different countries and their groups (clusters). Special attention is paid to Armenia, its neighbors and other EAEU member states. In the abovementioned countries, comparisons of the innovation relations index and the results recorded by its components are carried out. The risks of each of the components of innovation links that create problems for the stable operation of the innovation system are analyzed.

ECONOMIC SIGNIFIANCE AND DESIGN OF LOW AREA AND LOW POWER MAGNITUDE COMPARATOR

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Key words: Digital comparator, logic gate, transistor logic, SAED 32/28 nm

Introduction. The digital comparator is one of the most widely used combination circuits in electronics, designed to compare two binary numbers [Rajesh, 2014, 238-247, Parashar, 2015, 977 – 982]. A typical digital comparator contains NOT, AND, XOR, NOR logic gates that compare the digital signals present at their input terminals and produce an output depending upon the condition of those inputs.

For example, along with being able to add and subtract binary numbers we need to be able to compare them and determine whether the value of input A is greater than, smaller than or equal to the value at input B etc. The digital comparator accomplishes this using several logic gates that operate on the principles of Boolean Algebra. Comparators are used almost everywhere, especially they are irreplaceable in ALUs (Arithmetic Logic Unit), that is used in different architectures of processors, microprocessors, and microcontrollers.

Scientific novelty. Currently the electro energy is turning into one of the most important parts of the economy. That is why our study is aimed to design electrical schemes and components that attempt to further minimize the power consumption in their designs, given the fact that the number of transistors is continuously increasing in integrated circuits. To achieve power minimization, we are constantly improving low power designs, which helps to decrease the power consumption in electrical systems.

Table 1. Truth table of identical comparator

Input		Output
A	B	A
0	0	0
0	1	0
1	0	1
1	1	1

Types of comparators. There are two types of digital comparators: identical comparator and magnitude comparator. Both types make comparisons, but they are somewhat different. After comparing the numbers, the identical comparator generates 1 signal at the output, which indicates whether the input binary numbers are equal or not. Table 1 shows the truth table of 1-bit identical comparator.The magnitude comparator, unlike the identical comparator, generates 3 signals at the output during the number comparison, showing that the first number is greater than the second, less or equal. The truth table of 1-bit magnitude comparator is presented in Table 2.

Table 2. Truth table of magnitude comparator

Input		Output		
A	B	A	B	A
0	0	0	0	0
0	1	0	1	0
1	0	1	0	1
1	1	1	1	1

Figure 1 shows a 4-bit magnitude comparator gate level logic circuit. The circuit consists of 8 NOT, 4 2-input XOR, 2 2-input AND, 2 3-input AND, 3 4-input AND, 2 5-input AND, 2 4-input OR logic gates.

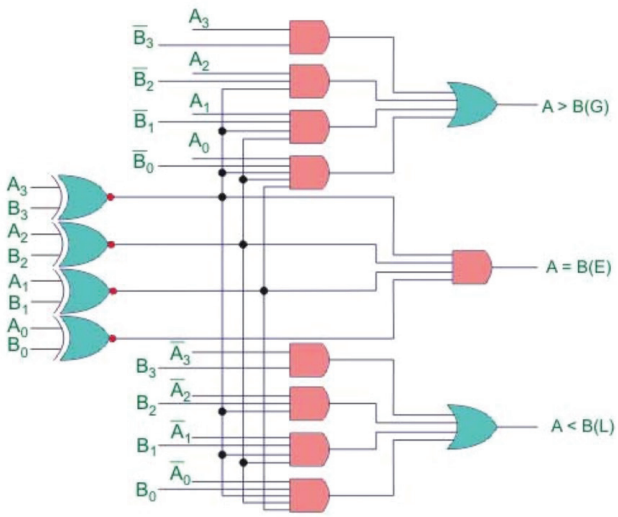

Figure 1. Gate level circuit of 4-bit magnitude comparator

If we calculate the total number of transistors, that is needed to make this circuit, then we will get: 8 * 2 + 4 * 8 + 2 * 6 + 2 * 8 + 3 * 10 + 2 * 12 + 2 * 10 = 150 transistors, which is a quite big number, taking into account the fact that technologies nowadays become smaller and smaller and the problem of circuit area becomes more significant.

Proposed architecture. There are special transistor logics that allow us to reduce the number of transistors in a single logic gate. Figure 2 shows NOR and AND logic gates that are designed using PTL (Pass Transistor Logic) and DVL (Dual Value Logic) logics [Bui, Wang, Jiang, 2002, 25-30, Sharma, Mehra, 2014, 57-60].

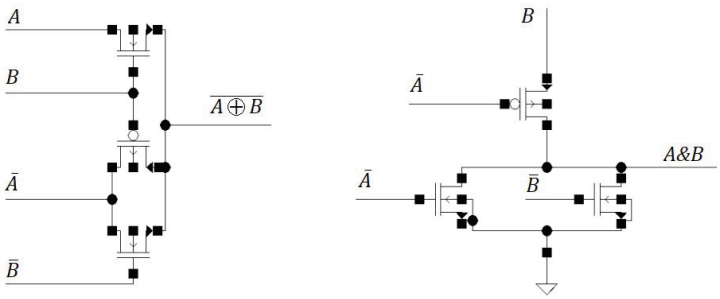

Figure 2. XOR and AND logic gates designed using PTL and DVL logics respectively

The research was conducted using Synopsys software tools. The goal of the work is to design a 3-bit comparator using a smaller number of transistors. To achieve this, some logic gates of the comparator will be represented by the mentioned PTL and DVL logics. Figure 3 shows the transistor level magnitude comparator scheme using CMOS technology. Figure 4 shows the same transistor level comparator circuit using PTL and DVL logic. The schemes were assembled using Custom Compiler software tool, and the simulations were performed with Hspice tool [Synopsys, 2018, 878].

According to the circuits, using PTL and DVL logics, the number of transistors decreases from 108 to 81. However, with PTL and DVL logics, the logic gates have a little disadvantage. Their output signals may deviate to some extent from the expected values. However, these deviations are not large enough to affect the overall functionality of the circuit. These signals pass through other logic gates, and, after making some improvements, they will finally disappear.

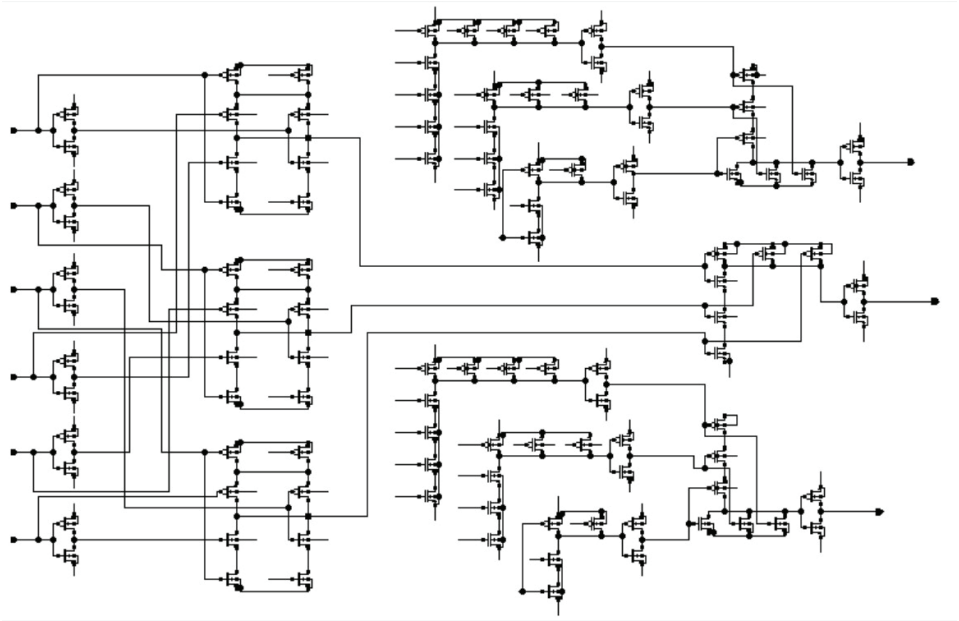

Figure 3. Transistor-level comparator circuit using CMOS technology

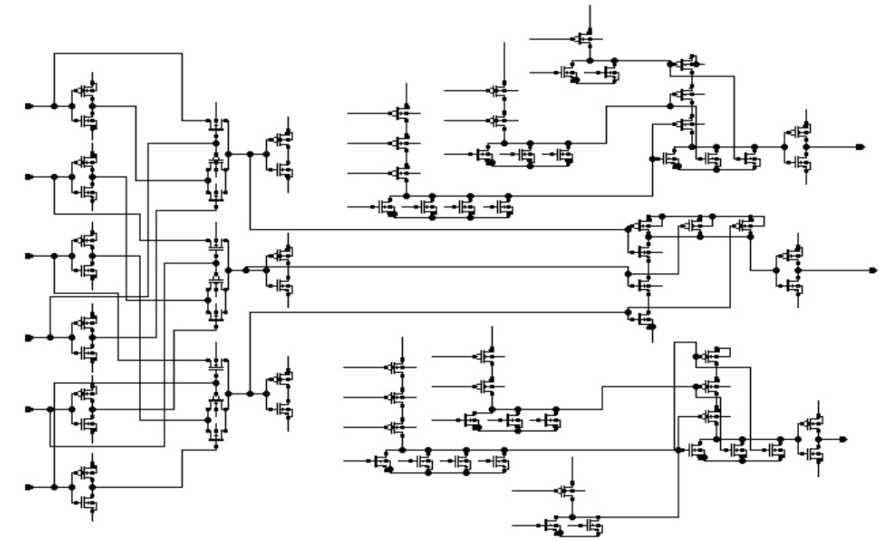

Figure 4. Transistor-level comparator circuit using PTL and DVL logics

Analysis and simulation results. Figure 5 demonstrates the input and output signals of the circuit, which is designed with CMOS technology. Figure 6 shows the input

and output signals of proposed comparator circuit. The signals were generated using Wave View software tool.

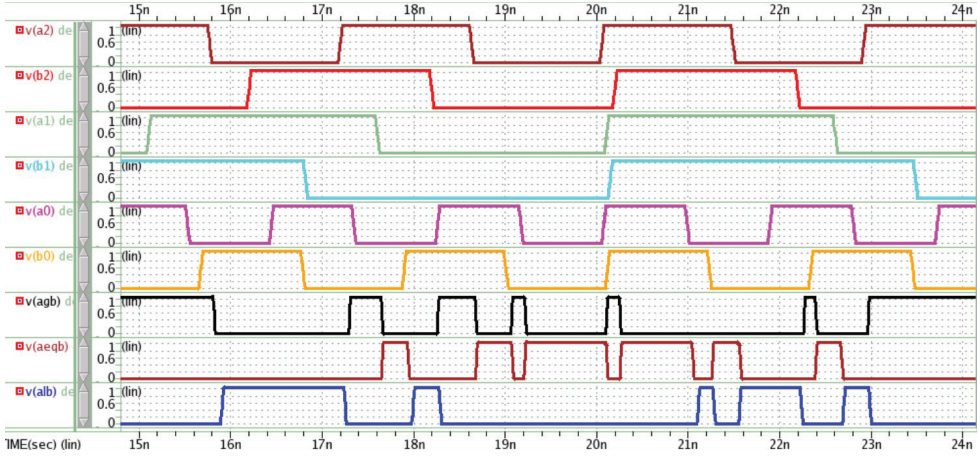

Figure 5. Simulation results of CMOS comparator

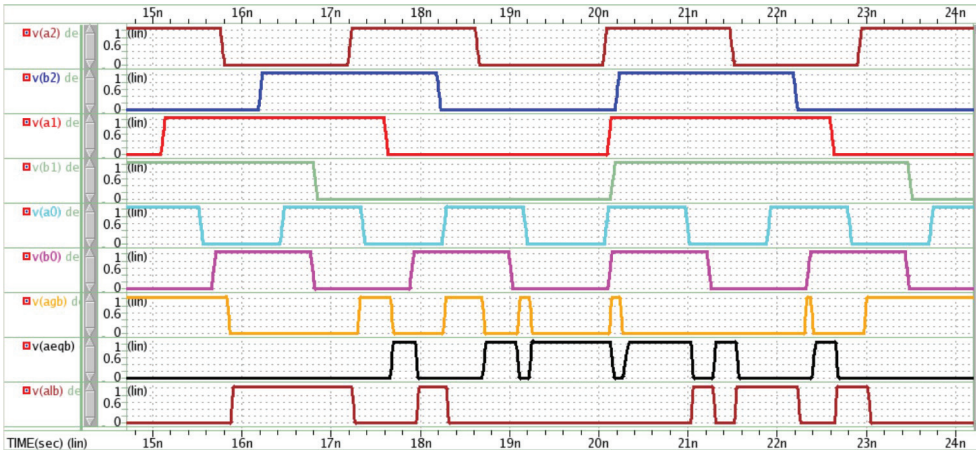

Figure 6. Simulation results of comparator circuit using PTL and DVL logics

Simulation results show that the functionality of both circuits are completely identical. Table 3 presents a comparison of some of the parameters of these 2 circuits using different logics.

Table 3. Comparison of parameters

Logic	Output load (fF)	Transistor number	Delay (ps)	Power (uWatt)
CMOS	1	108	67.9	4.5763
PTL, DVL	1	81	48.6	3.6015

Conclusion. In this article a 3-bit magnitude comparator circuit was developed, using standard CMOS technology and a new method, thanks to which, it consists of a smaller number of transistors. As a result, the circuit will occupy less area and have less power consumption. Some of the logic gates were designed using PTL and DVL logics instead of classic CMOS technology, due to which the number of transistors has been reduced from 108 to 81, or by 25%. The overall circuit delay has been decreased by 28.42% and the power was reduced by 21.3%. The circuit has been developed and simulated using SAED 32/28nm technology process.

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Design of low area and low power magnitude comparator

Key words: Digital comparator, logic gate, transistor logic, SAED 32/28 nm.

Multibit digital comparators take up large surface and high power consumption. As they are composed of logic gates, it is recommended to decrease the number of transistors in the logic gates using different transistor logics. By decreasing the number of transistors, the occupied surface and power consumption of the entire circuit will also decrease. The identical circuit was propounded applying standard CMOS (Complementary Metal-Oxide-Semiconductor) technology and with a combination of PTL (Pass Transistor Logic) and DVL (Dual Value Logic) transistor logics. Due to less area and decreased number of transistors, the physical design (layout) of the whole circuit will become easier and less time consuming from layout designer point of view, then in case of standard CMOS technology. As an output load was used a 1fF capacitance for both circuits. Correspondingly, the propounded circuit cuts down the power consumption by 21.3%, the delay was decreased by 28.4%, and the number of transistors was reduced by 25%. The circuit was developed using Custom Compiler tool. All the simulations are done using Synopsys Hspice and WaveView tools. SAED (Synopsys Armenia Educational Department) 32/28 nm technology process libraries have been used during the work.

ASSESSMENT OF THE RELEVANCE AND EFFECTIVENESS OF THE DEVELOPMENT OF THE AGRICULTURAL SEGMENT BASED ON THE INTEGRATION OF INFORMATION TECHNOLOGIES

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Key words: information technology, automation, agriculture, enterprise, efficiency, robotization, digitalization

Introduction. Agriculture is one of the most relevant areas of the national economy, which has individual characteristics in terms of production. The agro-industrial complex of Armenia has a key place in the development and life of the state, due to the fact that it is on its basis that the countries of the world are provided with food necessary for the life of the population. The development of this sector of the national economy has a fairly strong impact on the level of well-being of the population, because in some countries the level of agricultural production reaches as much as 90% of all trade goods.

Over the past decades, the agro-industrial complex (AIC) of Armenia has not been a business that would be attractive to an investor, due to a number of factors, i.e., a long production cycle, high exposure to natural risks, expressed in crop loss, the impossibility of automating biological processes and others. Until recently, the use of information technology in the agro-industrial complex was expressed only in the use of electronic computers and software with a narrow focus, in particular, financial management and transaction tracking. Despite this, information and digital technologies have great potential, through which it is possible to significantly improve the quality and efficiency of production processes in agriculture. The issues of increasing the productivity of the agro-industrial complex are becoming especially relevant in view of the rapidly growing population of the Earth, which, according to experts, by 2050 may approach 10 billion (Figure 1) [Dudnikova,Tkachev, Voloshchuk, 2019, 56-63].

Thus, the world population can reach more than 9.7 billion people, and therefore, to feed it, it is necessary to increase food production by more than 70%. Based on this, the agro-industrial complex needs to be modernized, scaled up and the efficiency of production processes increased. One of the solutions to the emerging problem is innovative activity in the agro-industrial complex, based on the active development and integration of digital technologies.

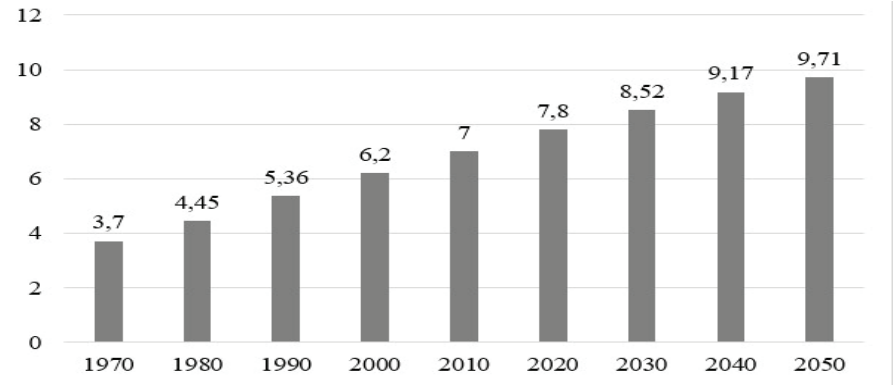

Figure 1. Projected world population (in billion people)

Methodology. Within the framework of the presented work, an analysis was made of the experience of the development and integration of information technologies in the agricultural field. The presented materials are backed up by real experience and research in this area. Theoretical and statistical research methods were used. To obtain the most relevant and objective data, statistical information was studied regarding the experience and effectiveness of the use of information and digital tools in agriculture, both around the world as a whole and separately on the territory of Armenia. The paper analyzes the current experience of using automated systems in agriculture, as well as highlights original conclusions regarding the prospects for further development in this segment.

Various scientific materials served as sources of information in the work. So, for example, the paper analyzed the scientific materials of such authors as: Dudnikova E.B., Tkachev S.I., Voloshchuk L.A., Voskoboinik V.F., Markaryan M., Cherkasov E.A., Koloskova D.A., Belova AS, Berdnova EV, Dulnev V.I., Belousov F.F., Tikhonov L.I. and others. In each of these works, the essence of the issue concerning the study of the field of application of alternative energy sources is separately disclosed. For example, in the materials used, such questions were raised as: the trend in indicators of sustainable development of agricultural production; deviation of physiological parameters in animals and computer diagnostics of diseases; information and computing support for the veterinary service; analysis of the use of automated and robotic systems in agriculture and a number of others.

Literature review. The agro-industrial complex is of tremendous relevance in its study today. To a greater extent, the relevance of studying this sector is due to the fact that it is agriculture that occupies a key place in the population of Armenian citizens. It is through agriculture that most of the food is produced, the presence of which is considered a paramount condition necessary for the life and functioning of any person. For the successful and more efficient functioning of this sector, it is necessary to integrate

and develop innovative systems and technologies that automate work activities, one of which is digital technologies. Information and digital technologies in general have more than once led to global changes in the life of society, increasing the efficiency and rationality of the functioning of processes in certain professional areas of human life.

Despite this, to date there are no studies, as a result of which an assessment of the state and prospects for the development of digitalization of agriculture is made. As a result of this factor, a problem arises, expressed in the absence of a methodological apparatus that reveals these issues, on the basis of which a vector is set for the development and development of other innovative technologies from the field of digitalization of agriculture. It is an exhaustive description of the current state and development prospects that can lead to really relevant and important research in this area, as well as direct resources to the development of innovative or modernization of existing technologies. Based on this, the author attempts to analyze the current situation and identify development prospects in the issue of digitalization of agriculture, followed by systematization of the knowledge gained [Voskobojnik, 2013, 26-29].

Analysis. According to the materials of the international independent Agricultural Policy Institute, the key trend of the world economy in the last decade is the widespread introduction of digital technologies. In agriculture, the priority direction is the use of an integrated management system for the fleet, equipment, and more. However, the level of digitalization in agriculture remains low. The world leaders in the implementation of digital technologies are IT companies, media, finance and insurance (Figure 2).

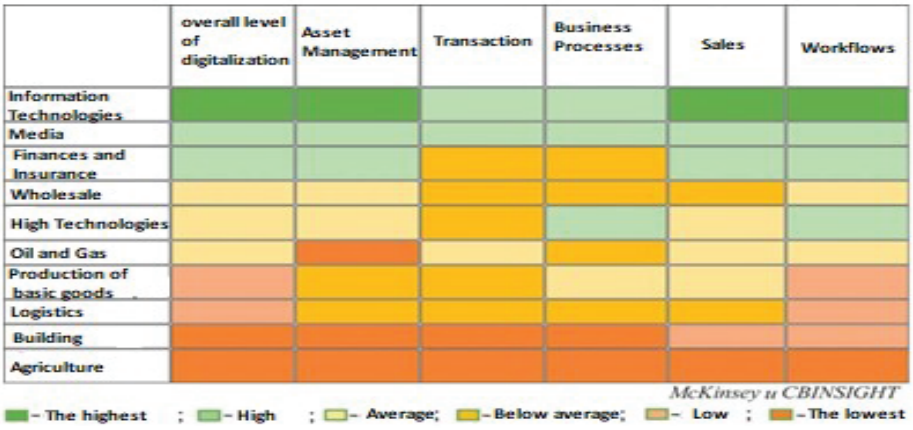

Figure 2. Comparative level of digitalization by sectors of the world economy

As can be seen from fig. 2, the level of implementation of digital technologies in the agricultural sector is quite low today, yielding to almost all other sectors of the economy. It should be noted that according to the Ministry of Economy of Armenia, at the

current time in our country, only 10% of arable land is processed on the basis of integrated digital technologies. In parallel with this, it is noted that the non-use of innovative information technologies can lead to a loss of up to 40% of the economic effect [Markaryan, 2010, 76-84].

Despite the low level of development of digital technologies in the agro-Industrial complex today there are still a number of inventions that have proven their effectiveness in real application. Some of these examples are smart greenhouses, automatic robotic harvesters and others. In the modern world, studies of the possible integration of digital technologies in solving problems in the agricultural field continue, but this happens at a rather low level and speed. This factor is also a consequence of insufficient funding aimed at the innovative development of the agro-industrial complex [Cherkasov, Koloskova, Belova, Berdnova, 2019, 35-39].

Studying the key current directions in the field of digitalization of agriculture, it should be noted that it is robotization (automation) and work with big data that are the fundamental vectors, the development of which can increase the efficiency and rationality of technological processes in the agro-industrial complex. It should be noted that the automation of production processes is understood as the use of such equipment, which makes it possible to carry out the technological process according to a predetermined mode. In this case, a person does not use physical force, but only controls the correct operation of machines. It is also worth noting that the introduction of automatic and remote control systems for the production equipment of the agro-industrial complex is one of the priority measures to ensure the safety of workers today.

Analyzing the main processes taking place in developed foreign countries regarding the digitalization of agriculture, it should be noted that in order to ensure high competitiveness in world markets, the agro-industrial complex needs to rapidly increase the level of digitalization through the use of innovative achievements in the field of digital technologies [Dul'nev, Belousov, Tihonov, 2014, 111-116].

The Internet of Things (IoT) is a key technology that can increase the efficiency of the agro-industrial sector in the future. The Internet of Things is a network of interconnected physical things or devices that have embedded sensors, and software that exchanges data between society and information systems through a huge number of standard communication protocols. In addition to sensors, the network may include actuators that are located inside the objects themselves and operate with each other using wireless and wired networks. These devices have the following functions: reading; work activetion; programming; identification; the possibility of automated work due to the presence of intelligent interfaces. Relevant data on figure 3 shows the priority areas for the use of IoT technology in agriculture in the near future [Iskaliev, Bekaeva 2020, 52-58].

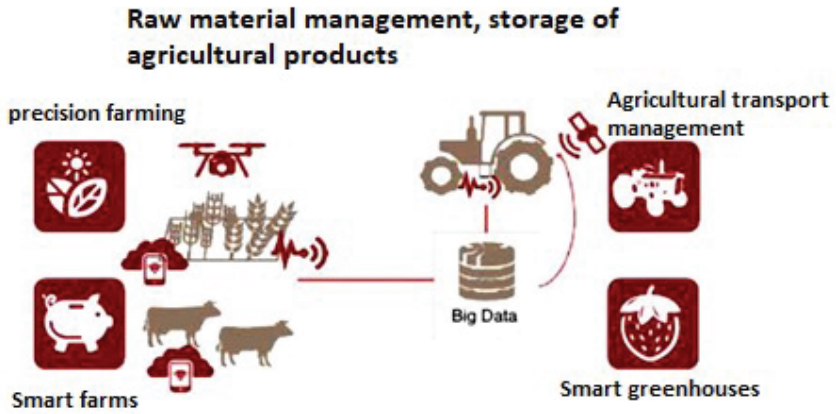

Figure 3. Areas of use of IoT in agriculture

"Smart" agriculture aims to maximize the automation of technological processes occurring in the agro-industrial complex, while increasing the yield and quality of products. For example, according to experts of this market, automated systems for feeding, milking and monitoring the health of livestock are capable of increasing milk yield by more than 30%. For example, based on the use of GPS systems or global positioning systems that can be installed at any agro-industrial complex, the farmer gets the opportunity to control the functioning of agricultural machinery. Another such means are remote measurement sensors. On their basis, on a remote basis, the level of soil moisture, air temperature, etc. is controlled. These tools alert specialists in real time, indicating the intended actions in order to carry out the necessary measures in a particular non-standard situation. Also an important role is played by various tools that allow automating business processes (Figure 4) [Plaksin I., Trifanov, Plaksin S., 2018, 36-43.].

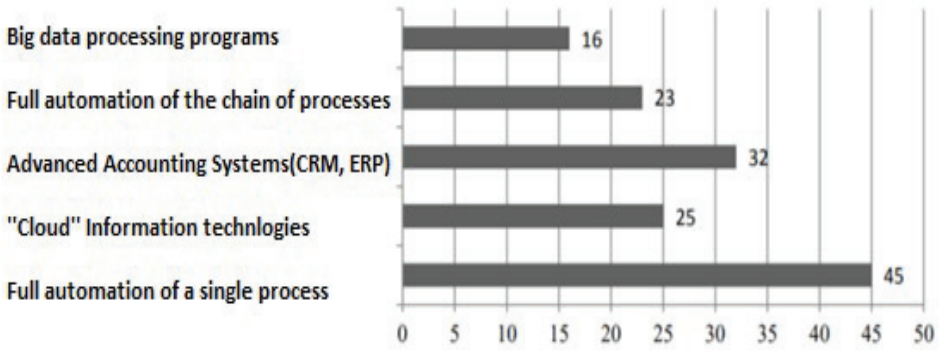

Figure 4. Implemented technological innovations in agriculture, %

The key direction of integration of information technologies in the agro-industrial complex is to maximize automation at each of the stages of production functioning in the general system. On the basis of information technology tools, the organization of systematized operations is carried out, through which the use of enterprise resources is carried out in an automated manner. Digital technologies include a number of production and software-technological tools that are combined into a technological chain through which such processes are performed as: collection, storage, processing and output of information flows. The main goal, which is laid down in the integration of IT, is to reduce labor costs when using and processing information resources.

Based on the above information, the introduction of digital and information technologies in order to provide automated technological processes in the agro-industrial complex can realize a kind of revolutionary transition in decision-making for the farmer based on tools that allow you to perform quick and accurate analyzes of certain factors.

Conclusions. The main goal of this work was to study the innovative activities related to the integration of information and digital technologies in the agro-industrial complex of Armenia. The attention of the article was focused on the impact of innovation processes and the development of technological processes in the economic aspect. Thus, the segment of information technology, which is developing at one of the most intensive rates in comparison with other sectors of the modern world, is of great relevance in almost all spheres of life of a modern person.

One of the directions of active development and integration of information technologies is the agricultural industry. Through various electronic and automated systems, modern farmers are able to significantly increase the efficiency of production on their farm. In conclusion, it should be noted that through widespread digitalization, it is possible to automate, rationalize the use of resources, and other things that can greatly increase the efficiency of the farmer's work.

The materials presented within the framework of this article can be used by scientific representatives who aim to improve the efficiency of agricultural enterprises by the integration of various information technologies. After studying this article, the researcher can find out the priority areas and prospects for the development of digital technologies in the agricultural sector, as well as get acquainted with the current information regarding the current state of development of this issue. Based on this, the presented article has the material necessary for the initial study, which introduces the reader to the key issues related to the topic of this study.

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Arman MARTIROSYAN, Gevorg KARAPETYAN, Gevorg HARUTYUNYAN
Assessment of the relevance and effectiveness of the development of the agricultural segment based on the integration of information technologies
Key words: information technology, automation, agriculture, enterprise, efficiency, robotization, digitalization

Information technologies occupy a key place in the development of issues of improving the rationality and efficiency of modern enterprises. This direction of technological progress finds its application not only in solving various professional tasks, but also in various household and other issues of daily human activity. The widespread development of information technologies presents tremendous results in improving the efficiency and rationality of the work of modern enterprises. One of the directions of development of this segment is the agro-industrial complex. To date, various advanced and other innovative technologies are being integrated in agriculture, which greatly simplify the life of a modern farmer. Within the framework of this work, the issue related to the assessment of the relevance and effectiveness of agricultural development through the introduction of information technologies is covered in more detail. The main subtasks of this article are the study of the following aspects: the relevance of the development of information technologies within the framework of the modern agro-industrial complex of Armenia; the need for the development of information technologies within the modern agro-industrial complex of this country; promising technologies integrated today from the field of information technologies in the agro-industrial complex of Armenia. The author has obtained unique conclusions that can be useful in further research in similar fields of science.

ASSESSMENT OF TAX BURDEN IMPACT OF PER INDIVIDUAL TAX TYPES ON THE ARMENIAN ECONOMY

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Key words; taxes, tax burden, economic growth, profit tax, value added tax

Introduction. The most common classifications of taxes found In research works referring to the assessment of the taxes affect on the economy and its individual sectors (when discussing certain types of taxes or their impact) suggest the following types: direct and indirect taxes, corporate and personal income taxes, distortionary and non-distortionary taxes, taxes on factor and non-factor income and other classification of taxes.

In their reports Romero-Avila and Strauch discuss the negative role of direct taxes on the growth of GDP per capita [Romero-Ávila and Strauch, 2003, 26]. The authors conclude that direct taxation has a rather negative impact on the accumulation of physical capital. In the monograph presented at the Fifth Ukrainian-Russian Conference entitled "Theory and Practice of Tax Reforms", the authors note that in terms of economic efficiency consumer taxes on non-factor income have a number of advantages over taxes on factor income:

- In contrast to taxes imposed on factor income, consumer taxes are regressive.
- As the marginal propensity of consumption decreases with the growth of income, consumption taxes (the burden of which largely falls on low-income households) have a greater impact on consumption and less effect on savings.
- Consumption taxes do not reduce savings returns, so they do not tend to reduce aggregate savings, which happens in the case of taxes on factor income.

Taking into account above stated arguments the authors emphasize the importance of applying consumption taxes in countries with emerging markets.

Literature review. In research papers related to the assessment of direction and size of individual impact of each tax type on economy situations when the adverse effect of corporate tax burden on economic activity/growth rate is the largest (compared to the impact of other taxes) are very often depicted. One of the reasons for such immensity is that corporate taxes can have a significant impact on consumption, investment and employment rate. Let's consider some of the research on the impact of corporate taxes on the economy. The theorists Lee and Gordon, examining the economies and tax systems of

more than seventy countries, indicate that corporate taxes as a whole have had a rather negative impact on economic growth [Lee. Gordon, 2005, 1041].

OECD analyst Johansson also addresses the negative economic impact of corporate taxes. Johansson states that regarding the impact on economic growth the corporate tax is the most harmful one. According to the author, in view of similar impact, the corporate tax is followed by the income tax and then by consumption taxes [Johansson, 2008, 2]. Another OECD analyst, Jens Arnold, also reports that corporate taxes have the greatest negative impact on the economy, GDP per capita while consumption taxes, taxes on personal income and real estate taxes, have a relatively positive impact on economic growth [Arnold, 2008, 2]:

Naive approach. In light of the aforementioned discussion, estimation of the impact of the tax burden of specific tax types in the Republic of Armenia is of special interest. In this case, taking into account that the RA Tax Code is currently in effect in the RA and the RA tax system's functions are primarily regulated by the RA Tax Code, upon which the main legal relations for certain types of taxes are established, it would be relevant to estiamte the economic impact of tax burden for specific tax forms in reference to 2016 year, when the Tax Code was approved by the RA National Assembly. In accordance with Article 6 of the RA Tax Code, taxes can be state or local. The types of state taxes are; value added tax (VAT), excise tax, profit tax, income tax, environmental tax, road tax and turnover tax. Local taxes can be 2 types; real estate tax and vehicle property tax. The following tables represent the tax revenues for the 4 main types of taxes which provide the largest budget incomes.

Table 1. VAT revenues in 2016-2020, in billion drams

Year	2016	2017	2018	2019	2020
VAT, including:	391.1	408.8	438.2	474.4	471.6
VAT from internal circulation	157.0	121.0	141.6	120.9	187.8
VAT From import	168.2	203.3	204.6	247.3	176.5
VAT on imports from EAEU	65.9	84.5	92.0	106.2	107.3

Table 2. Income tax revenues in 2016-2020, in billion drams

Year	2016	2017	2018	2019	2020
Income tax	332.8	341.2	356.6	410.3	411.2

Table 3. Profit tax revenues in 2016-2020, in billion drams

Year	2016	2017	2018	2019	2020
Profit tax, including:	127.2	110.0	170.1	181.3	148.8
Profit tax from residents	98.4	84.0	150.9	159.7	125.6
Profit tax from non- residents	28.8	26.0	19.2	21.6	23.2

As VAT has the largest share in the tax revenues of the Republic of Armenia in 2016-2020, so comparing to other types of taxes, the largest tax burden comes on VAT. As of the same period, the value added tax is followed by the income tax, the profit tax and the excise tax per their share size.

Table 4. Excise tax revenues in 2016-2020, in billion drams

Year	2016թ.	2017թ.	2018թ.	2019թ.	2020թ.
Excise tax, including:	59.7	82.3	109.0	127.5	123.6
Excise tax from the products produced in RA	24.1	37.2	61.8	68.0	62.3
Excise tax from goods imported to Armenia	25.7	31.5	37.5	43.9	40.4
Excise tax for goods imported from EAEU member countries	9.9	13.6	9.7	15.6	20.9

Taking into account the above-mentioned, the indicators of tax burden of individual types of taxes in 2016-2020 is represented in the figure below.

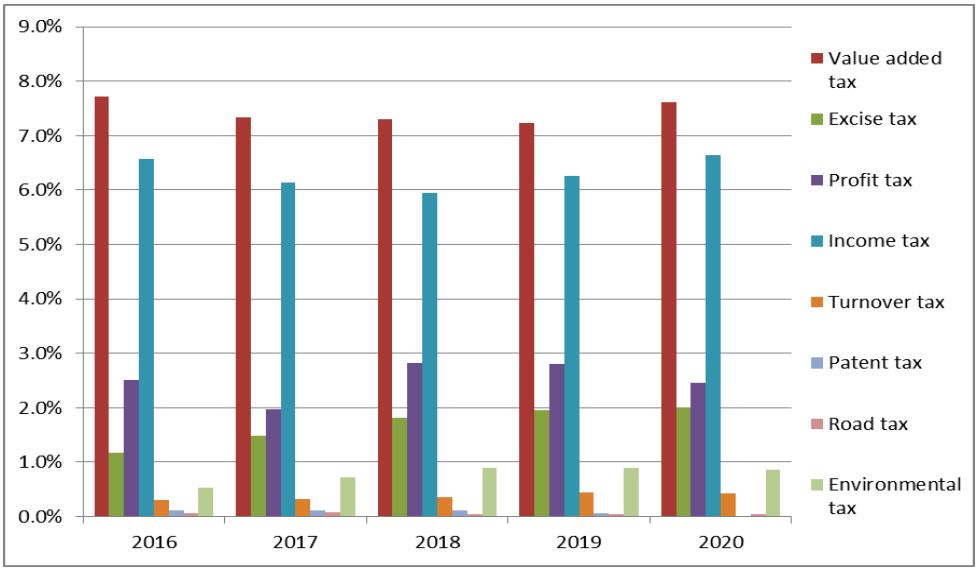

Figure 1. Tax burden of individual types of taxes, in percentage

According to data of individual tax types, in 2016-2019, there were no significant changes in the tax burden for any taxes, except for the patent tax, which was sharply reduced due to the fact that entites engaged in the avtivites of public catering sector, who had been considering patent taxpayers until the amendment to the Tax Code upon the law HO-338-N entered into force on 01.07.2018, became turnover taxpayers due to the change in the tax code became turnover taxpayers and moreover, since 2020 the whole patent tax system has been declared invalid.

At the same time, due to the economic downturn in 2020 as a result of both the coronavirus pandemic and the 44-day war, tax revenues on almost all types of taxes began to decline compared to the previous year, the most significant of which was the profit tax revenues the loss of which amounting to about 32.5 billion drams. As for the change of the tax burden according to different types of taxes in separate years, here we should be guided by the annual reports[1] of the State Revenue Committee of the RA.

Metholodogy. As we have mentioned, upon the current research we have set up a goal to find out the impact of certain types of taxes applied in the Republic of Armenia (changes in the tax burden on those types of taxes) on the Armenian economy (gross domestic product). by applying econometrical model. When considering the model, it is necessary to take into account the following main methodological peculiarities:

- Monthly data were used in quantitative calculations[2]:
- The sample length in the models is 60 (here we have used monthly indicators for the period of 2016-2020)[3].
- Models with different characteristics were built within the frame of the same calculation method (OLS calculation method), thus creating an opportunity to observe and estimate the economic impact sizes of the belwo mentioned fiscal units by groups within different model modification.
- In quantitative calculations, apart from relative indicator of gross government expenditures/GDP ratio, we involve the relative indicators of tax revenues/GDP for the following fiscal units:

1) value added tax,
2) profit tax,
3) income tax,
4) excise tax,
5) environmental tax,
6) turnover tax,
7) other tax revenues.

In the research related to the subject «fiscal policy-economic growth» World Bank theorists H. Davoodi and H. Zoo desing the model of that relationship, based on hypothesis that GDP per capita has a functional relationship with tax rates and the share of expenditures made by various government agencies. This approach makes it possible to

[1] The source` https://www.petekamutner.am/siPublications.aspx?ptname=AnnualReports
[2] The source` https://armstat.am/am/
[3] Quarterly GDP indicators for the period 01.2010-12.2020 were brought to the monthly level, using the ratios of the quarterly GDP growth indicator to the average economic activity indicator of that quarter. Quarterly government gross expenditures were brought to a monthly level, dividing the quarterly indicators by the number of months constituting the quarter by arithmetic mean.

observe and quantify the impact of certain taxes on the rate of economic expansion and economic activity[1].

Scientific novelty. Based on our analysis of the impact of the tax burden of certain types of taxes on the economic growth of the Republic of Armenia we discovered that out of current types of taxes applied in Armenia a negative impact on economic growth can be observed mainly in case of profit tax, VAT, as well as turnover tax, while tax burden per excise tax, environmental tax, as well as income tax mostly have a positive impact on GDP.

In this respect, the results of our models are not coincidental at all and once again, they substantiate the opinion that increasing the tax burden on low-demand-flexibility fiscal taxes (excise tax, environmental tax, real estate tax, as well as passive income tax) can have a positive impact on economic growth, while raising the tax burden in the case of high-demand flexibility taxes, is not economically feasible.

Analysis. The correlation between tax types, government spending and economic growth can be modeled as follows:

$\Delta y_t = b_0 + \Sigma b_{i1} * \Delta T_{it} + b_2 * \Delta X_t + \varepsilon_{it}$ **(37)**, where

- Δy_t is the RA's GDP growth rate at the t moment,
- b_0 is the angular coefficient to be assessed,
- b_{i1} is the coefficient that describes the impact of the tax burden onper the i-th tax type on the economy[2],
- b_2 is the coefficient that describes the impact of the RA's gross public expenditure/RA GDP ratio on the economy.
- ΔT_{it} is the index of growth rate of the tax burden per the i-th tax type at time the t moment,
- ΔX_t is the growth rate of the gross government expenditure/GDP ratio at the t moment,
- ε_{it} is the noise component which encompasses factors that are not included in the model (assumed to be i.i.d.).

The estimated coefficients of all variables in the models are statistically significant (at least p-value <0.1). The coefficients' covariance matrices are estimated using Newey-West heteroskedasticity and autocorrelation consistent estimators in the models. Table 5 represents the results of models designed with different combinations of fiscal units:

[1] We also have used this hypothesis to model the interaction of tax-economic growth. Unlike the model proposed by Davoodi and Zoo, in our model each type of tax is presented not in terms of its own tax rate, but in terms of its tax burden; tax revenue/GDP ratio for each type.

[2] Depending on the model specification, the increase in the tax burden on taxes is calculated using either the first difference of the gross tax revenue/GDP ratio or the first difference of the logarithmic value of the gross tax revenue/GDP ratio.

Table 5. Results of 5 models built with different combinations of tax and budget units

Variables	Model 1 (estimated coefficient sign)	Model 2 (estimated coefficient sign)	Model 3 (estimated coefficient sign)	Model 4 (estimated coefficient sign)	Model 5 (estimated coefficient sign)
C	-	-	-	-	-
Gross government expenditure/GDP	+	+	+	+	+
VAT/GDP	-	N/A	N/A	N/A	-
Profit tax/GDP	-	-	-	-	
Income tax/GDP	N/A	+	N/A	-	+
Excise tax/GDP	+	+	-	+	+
Environmental tax/ GDP	N/A	N/A	+	+	N/A
Turnover tax/ GDP	N/A	-	N/A	-	N/A
Other taxes /GDP	-	N/A	-	+	-
R-squared	0.7526	0.2887	0.2895	0.6978	0.2787
Adjusted R-squared	0.7297	0.2228	0.2238	0.6571	0.2119
S.E. of regression	55884	94756	94701	62936	95422
Log likelihood	-738	-770	-769	-744	-770
F-statistic	32.8563	4.3843	4.4024	17.1579	4.1733
Prob (F-statistic)	0.0000	0.0021	0.0019	0.0000	0.0028
Prob(Wald F-statistic)	0.0000	0.0101	0.0008	0.0000	0.0147
Included observations	60	60	60	60	60

Conclusion. Summarizing the results of the obtained models, we can infer the following:

- According to the estimates of all five models, the growth of the Gross Government Expenditures/ GDP ratio had a positive effect on economic growth, and vice versa.
- According to the estimates of the two models, in which the gross tax revenue / GDP ratio for VAT tax type was represented, the impact of the latter's growth on economic growth was assessed to be negative.
- In all four models, in which the gross profit tax revenues/GDP ratio was represented, the impact of profit tax growth on economic growth was assessed to be negative.
- In two of three models, in which the gross income tax revenue / GDP ratio was represented, the impact of the latter's growth on economic growth was assessed to be.
- In four of five models, in which gross excise tax revenues/GDP ratio was represented, the impact of excise tax growth on economic growth was assessed to be positive.
- According to the estimates of the two models, in which the Environmental Payments / GDP ratio was represented, the impact of the latter growth on economic growth was positive.

- According to the estimates of the two models, in which the gross turnover tax revenues/GDP ratio was represented, the impact of the turnover tax growth on economic growth was assessed to be negative.
- In three of the four models, in which the other tax revenues/GDP ratio was represented, the impact of the latter's growth on economic growth was assessed to be negative.

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Vladimir MKTRCHYAN, Karen SAROYAN, Martun HOVHANNISYAN
Assessment of tax burden impact of per individual tax types on the Armenian economy
Key words; axes, tax burden, economic growth, profit tax, value added tax

In the basis of generating the needed state revenues for the efficient operation of each country is well designed tax policy. Tax system is the basis of the tax policy and it's study begins and ends with analysis of the main elements, i. e. taxes. Studies on the role and essence of taxes and their impact on the economy have been conducted since ancient times and the are still widespread. In addition to providing the needed state revenues, taxes has also another prior role due to it's regulatory characteristic as they serve as a means of implementing income redistribution function the people of different social and income groups, which aims to balance the disproportion of income and wealth between these layers. Taking into account the above mentioned, we have made an attempt to assess the impact of the tax burden for each separate tax types on the economy of the Republic of Armenia.

ON INSTITUTIONAL DETERMINANTS OF DEMOCRATIC VOLATILITY (CASE OF UKRAINE)

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Key words: institutions, electoral system, democratic erosion

Introduction. This paper aims to outline the regime change in Ukraine in frame of its foreign policy choices, geopolitical situation, institutional and cultural heritage. As well as discuss current state of democracy, its perspectives and developments, rationales behind democratic stagnation and erosion. For that purpose, it is essential to unveil the institutional heritage and path dependence that shaped the current institutional environment in Ukraine.

Scientific novelty. This paper is worthy as it suggests holistic approach to study Ukraine's rapid regime changes and reasons behind it, which covers historic and civilizational tracking of the problem, institutional heritage and current institutional environment, geopolitical context. Although this research doesn't cover reason current stage of Russian-Ukrainian conflict escalation, it exposes rationales behind the conflict. Moreover, it discusses internal and external factors for regime volatility: institutional environment and foreign policy choices respectively. As a result, paper outlines general principles for conflict mediation and resolution, and eventually sustainable democratic transit.

Methodology. Paper exploits qualitative methods to unveil reasons of Ukraine's democratic waves and ebbs. Paper adopted institutional approach to discuss the determinants. Particularly, electoral institution, judicial system are analyzed. Apart from that paper uses historic, comparative methods to study historic effects and current geopolitical shifts, as well as their effect on regime quality. To review certain institutions in the frame of democratic transit content analysis is applied as well.

Literature review. Path dependence is not a completely deterministic category and as Levy [Levy, 1997, 78] argues it means that once a country or region has started down a track, the costs of reversal are very high. She prefers comparison with tree rather than path, which has different branches from the same trunk. Even though it is possible to change the branch the climber began with, it is more likely that she will proceed with the initial choice. Ukraine, historically and culturally divided into two parts, has two vital, in many cases mutually intolerant "roots". First, are the Cossack roots, proto-Ukrainian polities, which by the assessment of various experts (Kotovchikhina et al., 2020, p. 283) had democracy and freedom as imperatives in their life. These roots are closely connected with Western/European identity and values. Second, are tsarist, orthodox, hierarchic roots strongly tied with Russia. This division in more conceptualized manner is pre-

sented by Huntington [Huntington, 1993, 35), who puts Ukraine, where western part is dominated by Uniate tradition, while eastern part by Orthodox, in a row of cleft countries. Although some authors [Brudny & Finkel, 2011, 818] find heterogeneity of Ukrainian identity as an advantage and good soil for democracy in contrast to Russian hegemon, imperialist identity, Huntington (1993, p. 38) noted its destructive feature and predicted Ukrainian conflict with Russia long before it occurred.

Analysis. Another significant part of Ukraine's institutional heritage derives from its Soviet past, which fuels eastern-tsarist part of national identity. Several scholars suggest specific models of transit for post-Soviet countries different from the other regions (*Eastern Europe, Latin America*) of the third wave. McFaul [McFaul, 2002, 227] illustrates three scenarios of transit: a) resulting democracy due to mass movements and power of democratic challengers; b) resulting autocracy due to power imbalance favoring ancient regime; c) hybrid regime due to equal distribution of power. Karl and Schmitter (1994) disagree with McFaul's exclusive revolutionary model for democratic transit. Moreover, they (1995) emphasize the importance of "defining borders" for successful democratic transit. Data (VDem, Freedom House) shows that post-Soviet countries that had peaceful borders had greater democratic performance. Geopolitics and foreign policy choices had significant impact on regime change in post-Soviets, particularly in Ukraine. After its independence, Ukraine was among those few countries, where communist elites preserved significant influence [Karl and Schmitter, 1994, 972]. In spite of the smooth political transition, privatization and decayed economy created huge inequality and oligarchic class. With the economic crisis and hyperinflation first president was forced to organize snap elections to meet the demands of Donbas strikers (coal-producing region bordering with Russia). Despite the peaceful transit of power, Ukraine faced democratic decline during Kuchma's office, combining it with economic stabilization. In terms of international relations 1990s were times of NATO and EU expansion to the East. US and EU spent $1.5 billion on democratic promotion [McFaul, 2007, 61]. This triggered Russia's reluctance, however it was weak to resist [Mearsheimer, 2014, 77].

These actions of West saw wave of democratic revolutions in Serbia, Georgia, Ukraine and Kyrgyzstan from 2000 to 2005. Interestingly, relatively pro-Russian president Kuchma's positions were weakened due to the Kuchmagate, tape that leaked president ordering kidnaps and murders. Consequently, whistleblower found asylum in US, while US ambassador to Ukraine revealed that tapes are authentic and suggested that it was a response to Ukraine's arms' sales to Iraq (Materic, n.d.). Based on this McFaul implied that Ukraine's 2004 democratic Orange revolution was imported [McFaul, 2007, p. 57]. After Orange revolution pro-Western regime received significant assistance for democratic reforms, which resulted in increase in democratic score since 2005 [VDem, Freedom House]. Head of Ukraine's NED [Gershman, 2013] argued that US made great effort for democratic regime change in Ukraine and it aims the same result in Russia. He

also added after pro-Russian Yanukovich took the office, further support will receive Ukrainian opposition. Orange revolution failed to consolidate democracy in Ukraine [McFaul 2007]. As a result, Yanukovych came to power, pro-Russian politician, whose organized election frauds provoked the Orange revolution. Ziblatt and Levitsy [2018, 71-73] stress the importance of adhering to unwritten democratic rules. This was definetely not the case with Ukraine. In 2010 the 2004 constitutional changes that were aimed at limiting presidential power and its handover to the parliament were deemed [Constitutional Court decree, 2010] as unconstitutional since several procedural misconducts were made during their approval. And then decision was made to adapt all legal acts to 1996 constitution. This implied the cancellation of six-years' operating constitutional rule, and extension of president Yanukovych's power. Venice Commission [Venice opinion, 2010] considered the situation highly unusual, as the political system change was declared unconstitutional after a period of 6 years and by only Constitutional Court decree. Moreover, during political crisis of 2014 2010's decision was revised [Law, 2014] and Ukraine returned to the constitution of 2004.

After those actions democratic performance saw notable decrease. What's more, after years of negotiations with EU, Yanukovych decided to reject the agreement instead signing one with Russia. As a result, mass demonstrations forced Yanukovych to flee the country. Newly formed government canceled agreement with Russia and declared its pro-Western direction. This time, Russia, much stronger than it was, responded fiercely, which threw Ukraine into war [Mearsheimer, 2014, 81]. With Trump's isolationist foreign policy democracy in Ukraine did not receive notable support and the oligarch Poroshenko's time in office was deemed non-democratic, mainly due to the crisis.

Conclusion. Ukrainians exhausted of war, economic hardships elected new figure in Ukrainian politics, Zelensky, former comedian. The peaceful transit of power, due to inability of Poroshenko to misconduct during the elections somewhat signified democratic re-emergence [VDem, Freedom House]. Future of Ukrainian regime highly depends on the macro factors already mentioned: cultural schism between west and east, and how it can be effectively managed, geopolitical situation and ability of West, Russia and Ukraine to negotiate. Huntigtonian explanation of Ukraine has strong influence not only in West, but also in Ukraine, and how they perceive the current crisis. It is evident that Ukraine is culturally closely tied with Russia and normal relations with Russia are vital. To resolve the crisis and install sustainable democracy following actions are required (Brzezinski, 2014) from three main stakeholders: Russia accommodates with Ukraine by terminating the assault on its sovereignty and economic well-being, accepts Ukraine's prolonged journey toward eventual European Union membership with possibility of bilateral trade deal. At the same time, it should be made clear that Ukraine does not seek, and the West does not contemplate, Ukrainian membership in NATO.

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On institutional determinants of democratic volatility (case of Ukraine)

Key words: institutions, electoral system, democratic erosion

This paper attempts to examine institutional reasons behind democratic ups and downs in Ukraine. From historical, civilizational determinants to foreign policy, judicial, electoral systems are considered as defining factors for regime volatility. Civilizational factor is observed in the paper as a basic determinant upon which modern political institutions and practices are constructed. The paper accordingly discusses Soviet institutional heritage for the current institutional environment. Furthermore, the paper considering afore-mentioned determinants uses diachronic approach to trace regime changes in Post-Soviet Ukraine. What's more, paper outlines several events as critical junctures for institutional development and path dependence: as electoral rule changes, constitutional amendments. Aside from immanent systemic features paper accents external, geopolitical situation as well, linking democratic instability to geopolitical shifts. Eventually the paper forecasts that democratic erosion and volatility can be stopped, and democratic progress guaranteed only through "border defining", both physically and culturally, which is applicable for all Post Soviet states.

STUDYING THE MOST EFFECTIVE FPGA NEURAL NETWORKS: ECONOMIC AND MODELING ISSUES

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Keywords: FPGA, Neural Networks, Modeling, Simulation

Introduction. Computational imaging techniques, including object recognition, photo recognition, computational methods, and object tracking, typically use convolutional neural networks (CNNs). Using an FPGA-based diagnosis microprocessor with equal processing speed and efficiency is more complicated the more complex the CNN gets. Sophisticated and low-cost CNN designs such as ShuffleNet and Mobilenet are suitable for FPGA-based systems. On the other hand, researchers are still focused on maintaining as much processing and analytical power as possible [1]. As a solution to this matter, we provide Ad-MobileNet, a system constructed on the conventional MobileNet topology that utilizes fewer computer complexity while achieving classification techniques superior to some well-known FPGA-based platforms. When compared to the standard MobileNet concept, Ad-MobileNet offers something new.

Literature review. The Ad-depth module we develop outperforms the traditional feature maps convolution in this architecture. An embedded system can benefit from this component's improved precision without much raising the underlying hardware's calculation complexity. Research studies later discovered that making hardware design easier by removing several layers with a negligible impact on the prediction performance had been removed [2]. Third, effectiveness appears to be influenced by choice of convolution operation independent from precision. Hardware design uses simple evolutionary algorithms like Tanh, Rectified Linear Unit (ReLU), and sigmoid. Alternative input nodes work better than algorithms to help MobileNet generalize. As a result, we're adding Mish, Tanh Exponential (TanhExp), and ReLU to the list of acceptable non-linear activations.

Methodology. We applied the exponential approach to approximate the nonlinear transfer components TanhExp and Mish in the Ad-MobileNet design. A network is activated when using a learning algorithm if the summation is more significant than zero or if a bias is added. It's like a gate that checks to see whether an inbound number exceeds a predetermined limit [3]. The activation function's most important job is to make a neuron's response less linear. A neural network was little more than a linear regression app-

roach without a convolution operation, and linear regression models cannot address complicated issues like image recognition. Overall, the activation function enhances the learning algorithm, making it more capable of learning and doing more complex tasks [4]. For practical systems, nowadays, most researchers employ an essential nonlinear process that needs minimal computing power.

The figure below shows the overview of the proposed design:

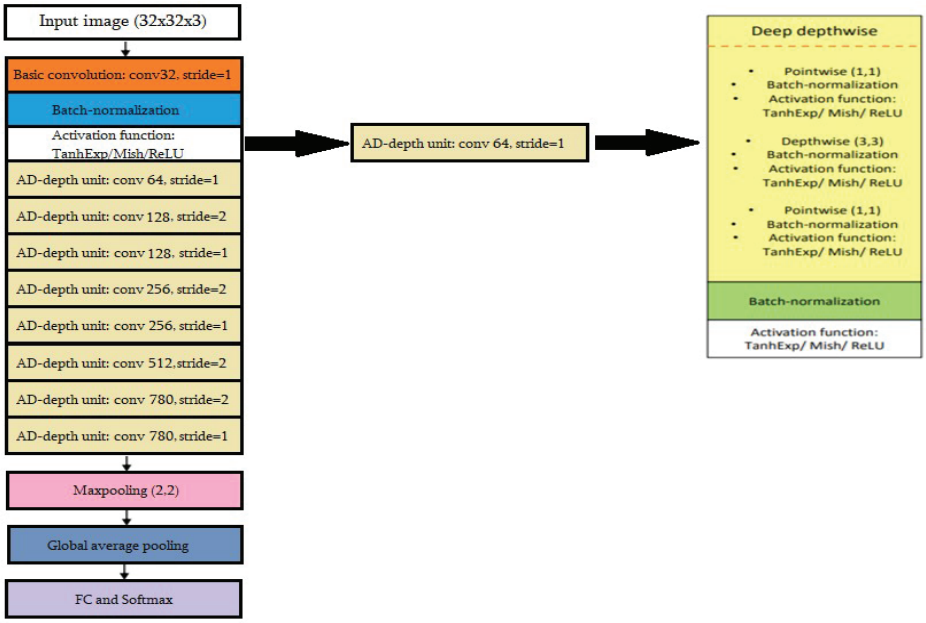

Figure 1. *Ad-MobileNet Schematic Structure*

Advantages of FGA over GPU and CPU: FPGA has three significant benefits over GPU and CPU: adaptability, network connectivity, and energy accuracy. Because FPGA enables developers to modify the underpinning hardware design down to the pixel level, demonstrating adaptability, this ability is what sets FPGAs apart from other types of hardware technologies. Because of this, the slowness of an FPGA is measured in nanoseconds [5]. When it comes to GPU, we're talking about milliseconds here. FPGA typically operates at a slower clock frequency relative to GPU and CPU, but it has a higher or equal calculating capability. As a result, FPGA may be more energy efficient. Xilinx's Virtex Ultimate FPGA platform and Nvidia's Tesla P4 GPU, both of which were released in 2017, are two examples of embedded systems released in 2017.

Beyond the FPGA board, CNN is an efficient algorithm for speeding up computation. CNN uses a considerable number of parallelizable exponentiation processes. A convolutional element's calculations are heavily reliant on the subsequent layer's output.

However, the same CNN model algorithms are primarily autonomous, laying the foundations for massively parallel computing. CNN methodology has currently flourished with the introduction of new arithmetic designs from that other standpoint. This ability means that each person's data is routed in a certain way. FPGA is capable of meeting the designer's particular needs and of achieving a high-frequency band. Binarized data and weights are used in BinaryNet, a predictive algorithm. XOR computations replace the standard CNN's amplification algorithms. FPGA could construct the system since it can express a structure at the bit-level with precision. On the other hand, average accuracy data formats are compatible on broad sense platforms like GPUs and CPUs. The binary image neural framework may use fewer requirements than integrating the network on GPU or CPU.

Scientific novelty. Deep Neural networks (DNNs) have been widely applied to finance and economic forecasting as a powerful modeling technique. Economic funda-mentals are important in driving exchange rates, stock market index price and economic growth. Most neural network inputs for exchange rate prediction are univariate, while those for stock market index prices and economic growth predictions are multivariate in most cases. Prediction performance of neural networks can be improved by being integ-rated with other technologies. Nonlinear combining forecasting by neural networks also provides encouraging results. Finally, this method is compared and contrasted with standard (statistical) approach on real economic data to show the potential of using deep neural network in modelling economic variables. For all these reasons the low-cost neural networks important in economics.

$$Mish(X) = \left\{ \begin{array}{l} x, 2 < x \\ 1.08273 \times x - 0.22053, 1 < x \leq 2 \\ 1.02872 \times x - 0.11989, 0 < x \leq 1 \\ 0.29798 \times x - 0.04853, -1 < x \leq 0 \\ -0.05617 \times x - 0.37574, -2 < x \leq -1 \\ -0.10802 \times x - 0.46768, -3 < x \leq -2 \\ -0.07294 \times x - 0.36108, -4 < x \leq -3 \\ -0.03876 \times x - 0.22528, -5 < x \leq -4 \\ -0.01855 \times x - 0.12508, -6 < x \leq -5 \\ -0.00838 \times x - 0.06455, -7 < x \leq -6 \\ -0.00049 \times x - 0.00632, x \leq -7 \end{array} \right\}$$

$$TanhExp(X) = \left\{ \begin{array}{l} x, 1 < x \\ 1.00522 \times x - 0.01850, 0 < x \leq 1 \\ 0.34275 \times x - 0.06743, -1 < x \leq 0 \\ -0.08953 \times x - 0.45752, -2 < x \leq -1 \\ -0.12067 \times x - 0.50794, -3 < x \leq -2 \\ -0.07575 \times x - 0.37267, -4 < x \leq -3 \\ -0.03929 \times x - 0.22795, -5 < x \leq -4 \\ -0.01864 \times x - 0.12562, -6 < x \leq -5 \\ -0.00840 \times x - 0.06466, -7 < x \leq -6 \\ -0.00049 \times x - 0.00632, x \leq -7 \end{array} \right\}$$

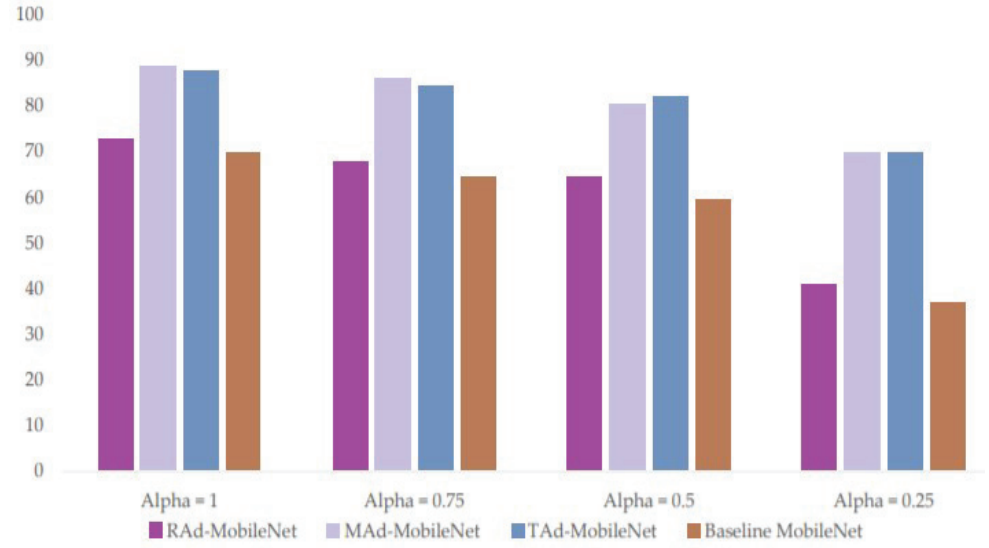

Figure 2. *Accuracy of the Models*

Research design. We use float-point encoding to computerize actual quantities like parameters, variables, and distortions to build the Ad-MobileNet model mostly on FPGA. It is possible to achieve high resolution while using a reasonable amount of physical servers with float-point notation. We Ad then set up the convolution layer in FPGA form with the execution of activation functions. Using Activation Modules ReLU, Tanh-Exp, and Mish, we developed the RAd-MoileNet, TAd-MobileNet, and MAd-MobileNet model on Virtex-7 FPGA xc7vx980t. We employed an image recognition application running on the CIFAR-10 database to show the functionality of models. This resource is divided into ten different categories. VHDL was the hardware modeling language applied in this research. We created the Ad-MobileNet framework to put the changes put into place. We decided to use the PWL methodology to depict nonlinear systems. Thus we experimented with three different convolution layers: TanhExp, Mish, and ReLU. Over the last DSC unit, we reduced the range level from 1000 to 700 by erasing the five new layers. The Ad-depth module has taken on the role of the DSC unit due to its increased thickness. The Ad-recognition MobileNet's performance is improved due to these changes, which use fewer system resources. PWL, TanhEx Mish approximations are developed on an integrated FPGA platform utilizing registers, one multiplier, and one adder for each technique un et al., 2010).

Experimental Results. The Figure below illustrates a comparison of MAd-MobileNet, TAd-MobileNet, RAd-MobileNet, and MobileNet using CIFAR-10 database:

Results Discussion. A look at Figure 3 shows the MobileNet simulation to be the most inaccurate (lowest accuracy). As a result, TAd-MobileNet and MAd-MobileNet

have high classification rates than the other two approaches (87.88 percent against 88.76 percent). In terms of hardware requirements, the RAd-MobileNet comes in last. It saves around 41% of the DSP required relative to the MobileNet solution. Additionally, the results show that employing a sophisticated non - linear transformation on an FPGA to build the system uses more physical hardware than utilizing ReLU. In this study, we compare the performance and efficiency of our suggested models' embedded system to other MobileNet-related designs that have been described in the past. They activated the device with ReLU.We attained a frequency of 100 MHz, the lowest value in Table 1 and 130 MHz less than the proposed methodology for RAd-MobileNet.

Table 1. Comparing MobileNet Models

	Model				Rad-MobileNet
FPGA	Intel Stratix 10	ZYNQ7100	XCZU19EG	XCZ9EG	Virtex-7 xc7vx980
DSP	298	1920	1030	1642	973
LUT	925,000	141,192	369,963	137,000	58,834
Frequency	155	102	205	155	230
Power (W	-	4.084	7.53	-	3.52
FF	581,000	186,641	392,715	54,000	80,723

In addition, their system used the most physical hardware (1920 DSP), making it the most powerful in the comparison. They employed 989 times as much DSP than was required for RAd-implementation. MobileNet's Additionally, they consumed 0.8 W more energy than RAd-MobileNet. According to researchers, there are two degrees of heterogeneity in the RAd-obileNet concept, one at the database level and the other at the desirable rate. These ideas attained the second-lowest wavelength on the table, at 155 MHz. In particular, they utilized 1642 DSP, the second-highest analytical hardware capability in the chart. Besides that, they utilized 137 K logic elements (LUTs), which is far more than twice as much as we used in our simulations. Tomato's researchers presented a methodology for automating the creation of effective CNN multipliers called Tomato. As a result of their advice, the MobileNet-V1 architecture used the minuscule DSP system resources of any. They did, however, use the most FFs and LUTs of everyone in the study. Compared to our approach, they employed around 16 times more LUTs. Their model also ran slower, clocking in at 69 MHz slower than ours—the scientists proposed a typical synthesis as an interpretation accelerator on the MobileNet-V2 connection. Their network reached the second-ranked speed of RAd-MobileNet, which attained an actual speed of 205 MHz. The DSP frequency used was higher than the RAd-

MobileNet execution by 83 DSP, however. In addition, those who used six times as many LUTs as we did.

Additionally, they consumed 7.53 W of power, which would be 4.1 W, far more RAd-MobileNet did. This trend suggests that our simulations successfully inaccuracy, energy consumption, and speed while requiring fewer system resources, as shown in Table 1. We choose the model that best fulfills our computing hardware capacity, efficiency, or reliability needs.

Conclusions. We aimed to create a structure with little physical servers but with the highest accuracy rate that didn't result in loss or destruction using an FPGA. To accomplish this, we enhanced the MobileNet-V1 framework. We commenced by removing any elements that were duplicating the resulting shape. Secondly, we experimented with different combinations of the training algorithm of ReLU, TanExp, and Mish to see what happened. All designs in this study employed the convolution layers of ReLU, TanhExp, and Mish. FPGA implementations of TanhExp and Mish non-linear transfer function became greatly facilitated by using PWL approximations. We used float-point integers to digitize the actual data. Thirdly, we amplified the classification rate of the design by replacing the complexity convolution component with a broader one called the Ad-depth module. We compared FPGA implementations on the Virtex-7 platform and other platforms regarding the number of physical servers, power efficiency, information processsing, and reliability. Also, with MAd-MobileNet modeling, we were able to attain a recognition performance of 88.76%, 18.72% more than for the basic MobileNet framework. In addition, the RAd-MobileNet design allowed us to achieve a bandwidth of 225 MHz, which is 120 MHz better than the primary method. It's essential to remember that we obtained the preceding performance with a simple local database CIFAR-10.

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Sergo HARUTYUNYAN, Garnik VOSKANYAN, Andranik GALSTYAN, Davit GABRIELYAN, Armen SAFARYAN

Studying The Most Effective FPGA Neural Networks: Economic and Modeling Issues

Key words: FPGA, Neural Networks, Modeling, Simulation .

Field Programmable Gate Arrays (FPGAs) are semiconductor devices that are based around a matrix of configurable logic blocks (CLBs) connected via programmable interconnects. FPGAs can be reprogrammed to desired application or functionality requirements after manufacturing. This feature distinguishes FPGAs from Application Specific Integrated Circuits (ASIC), which are custom manufactured for specific design tasks. The purpose of this paper is to study and compare various FPGA neural networks and determine the most effective among them in terms of energy efficiency. Even though various research studies worked on different FPGA neural model designs, very few researchers have considered comparing these designs to determine energy efficiency. This paper provides Ad-MobileNet as an efficient solution, a system constructed on the conventional MobileNet topology that utilizes fewer computer complexity while achieving classification techniques superior to some well-known FPGA-based platforms. Because of this, we've investigate the Ad-MobileNet model with larger datasets and a range of uses as part of continuing research.

PROMISING DEVELOPMENT OF THE AGRO-INDUSTRIAL COMPLEX BASED ON THE INTEGRATION OF ALTERNATIVE ENERGY SOURCES

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Key words. agro-industrial complex, agriculture, alternative energy sources, economic system, development

Introduction. The energy sector is an integral part of the practical in each of the areas of human life in the modern world. Alternative energy sources that are actively used today have many features and advantages over classical energy sources. The concept of "alternative energy" includes three main components, presented in figure 1:

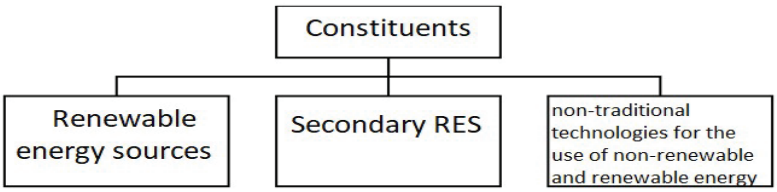

Figure 1. The main components of alternative energy sources

Most of the non-traditional energy sources are based on traditional principles, but at the same time, both local sources (geothermal, wind, etc.) and sources that are in the development status serve as primary energy in them, examples of which are fuel sources and elements, capable of finding applications in the future (thermonuclear energy, etc.). Fi-gure 2 shows an analysis of alternative energy sources that are actively developing in the field of agriculture today [Pavlova, 2013, 23-27]. The key features of non-traditional energy sources are their environmental friend-liness, as well as the enormous costs of capital construction and low unit capacity. For example, for the construction of a solar power plant in the agricultural complex of Armenia, with a capacity of 1000 MW, it will be necessary to attract expensive mirrors with an area of 4 km2.

Methodology. As a result of the work, theoretical and statistical research methods were used. To obtain the most relevant and objective data, statistical data were studied regarding the prospects and effectiveness of the integration of alternative energy sources. Due to the fact that the agro-industrial complex of Armenia is located remotely from the main generating stations, the issue related to the development of distributed generation based on alternative energy sources is of particular relevance. Statistical information is analyzed that reflects the essence of the current situation on this issue, and forecasts for

the coming years are made based on the results of the study. The sources of information in the work were various scientific materials published in domestic and foreign publiccations. So, for example, the work analyzed the scientific materials of such authors as: Esenov I.Kh., Eloeva R.K., Kenden, KV, Penjiev A.M., Mamedsakhatov B.D., Baranova MP, Klipatsky VN, Amuzade AS and others. In each of these works, the essence of the issue concerning the study of the field of application of alternative energy sources is separately disclosed. So, for example, in the materials used, such questions were raised as: actual problems of energy in agriculture; improvement of the food source in agriculture; autonomous power and water supply to desert pastures using solar photovoltaic installations and a number of others.

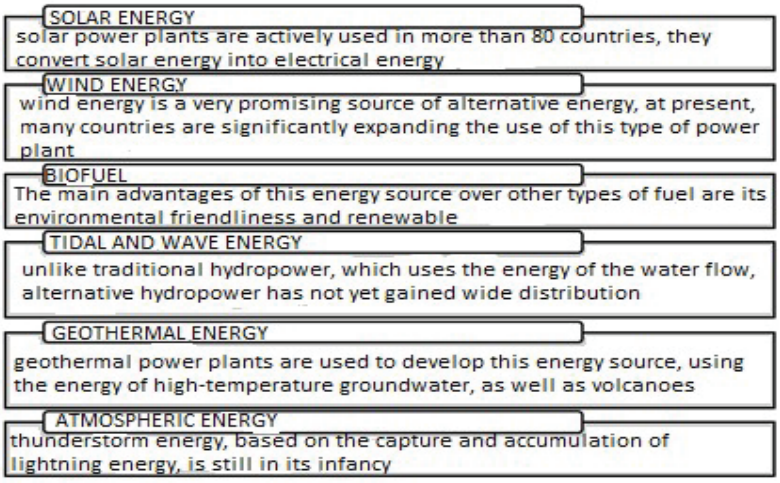

Figure 2. Analysis of alternative energy sources

Literature review. At present, the population of the Earth is increasing at a progressive rate, as well as the intensification of people's need for resources of various nature, including the electric power industry. Referring to the statistical information of the International Energy Agency, it can be said that electricity is at the center of the modern economy and provides a growing share of energy services. Demand for electricity in the coming years will increase as a result of rising household incomes, electrification of transport and heating, and an increase in demand for digital devices. Growth in demand for electricity was one of the key reasons why global CO2 emissions from the energy sector hit record highs in 2018, but the commercial availability of a diverse range of low-emissions generation technologies also helps guide efforts to fight climate change and pollution . In addition, decarbonized electricity [carbon-free energy sources] can become a platform for reducing CO2 emissions in other sectors with electricity-based fuels such as hydrogen or synthetic liquid fuels [Esenov, Eloeva, 2013. 11-15]. The need for energy system flexibility for Armenia's agriculture is growing even faster than the de-

mand for electricity, due to the growing share of variable renewable energy sources and the growing demand for both carbon reduction and electric vehicles. Power plants and power generation and transmission networks continue to be the backbone of power system flexibility. In this concept, renewable energy also plays an important role in ensuring access to electricity for all, and it is renewable energy that allows us to talk about a more sustainable development of the world, therefore, the Armenian Energy Agency pays attention to two concepts for the development of electricity in the agricultural field, presenting two scenarios: a modern policy in the field of the electric power industry and a policy of sustainable development of the electric power industry. In general, one can see in figure 3, which shows the dynamics of the development of energy sources in accordance with the above scenarios [Kenden, 2012, 34-39.]: figure 3 shows the dynamics of 2018-2040. terawatt-hour in two scenarios: current energy policy (left) and sustainnable electricity policy (right): light blue - coal, blue - natural gas, green - oil, turquoise - nuclear sources energy, yellow - hydropower, orange - wind energy, red - solar energy, purple - other sources of renewable energy. As you can see, the difference between the first policy and the second is significant.

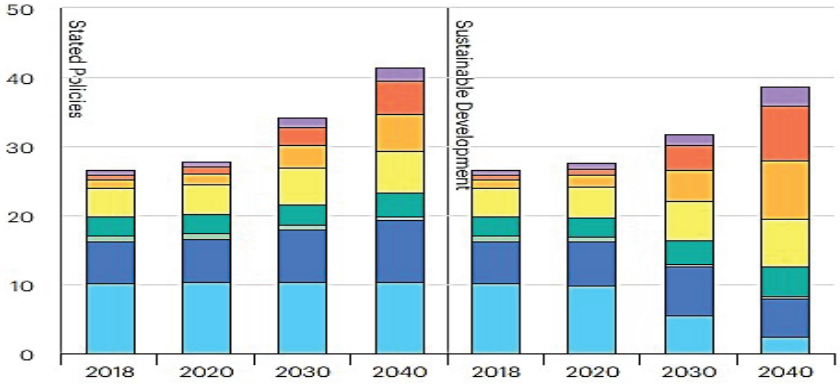

Figure 3. "Scenario" of fuel generation and its dynamics

The first policy assumes a "stop" on gas, coal and oil as the prevailing energy sources, which will further worsen the environment, while the sustainable development scenario allows us to talk about the dominance of renewable energy sources by 2040, which will significantly improve the environmental situation on the territory of Armenia. And, in principle, we can say that such a concept as distributed generation will help to achieve a paradigm of more conscious generation of electricity, as well as its use, which determines the relevance of our topic [Pendzhiev, Mamedsahatov, 2007, 112-115].

Analysis. So, as mentioned earlier, one of the most innovative technologies that can qualitatively increase the efficiency of energy generation and, in the long term, significantly reduce the cost of electricity for the agricultural segment of Armenia, are

distributed energy generation networks based on renewable sources. Alternative energy sources (RES) are among the most innovative forms of energy in use today. The main types of renewable energy sources include: hydropower, wind power, solar power [Baranova, 2016, 39-47].

Distributed generation based on renewable energy sources is one of the most relevant and promising areas for the development of the energy sector to supply energy to agriculture in the territory of Armenia. These technologies play a key role in improving the reliability and quality of the generated and supplied electrical energy. One of the positive arguments in favor of the implementation of distributed generation based on alternative sources is the absence of potential man-made disasters. This factor is especially relevant from the standpoint of strengthening energy security in local areas.

With regard to specific conditions, power plants based on renewable energy sources can be integrated into centralized networks. This scenario is the most relevant when the power of the power plant based on alternative sources is from several tens of kilowatts to several megawatts.

It is also worth emphasizing that with a low power source of energy, it would be most expedient to install it in close proximity to the end user. The most relevant role of distributed energy generation sources belongs to the case in which the end user has a remote location. In this case, distributed energy generation sources based on renewable sources will become the most economically and technically efficient technical solution for delivering electricity. The technical solution under study allows solving a number of urgent problems, taking into account the current difficulties in traditional energy, in particular, power supply systems for remote consumers [Trachuk, Linder, 2018, 231-236].

Continuing the conversation about the relevance and efficiency of the use of RES in agriculture in Armenia, it should be noted that the installation of autonomous energy sources based on renewable energy sources allows much more quickly and in real time to compensate for the interruption of electricity generation by other (centralized) energy installations .

One of the main factors determining the feasibility and relevance of integrated distributed sources of energy generation based on renewable sources is the assessment of their effectiveness. Thus, the effectiveness of integrating this technology into the energy balance is determined by a number of factors. Some of these factors are: capacity assessment; rationality of placement on the landscape; environmental assessment and others. Distributed generation based on renewable energy sources is inherently random in construction. In this regard, there is a need to change the typology of the network due to changes in power flows.

To solve this problem, in the modern energy complex of distributed generation in Armenia, various means of intelligent control or full-fledged networks of distributed generation are integrated at the borders of individual regions. It should be noted that the full potential and efficiency of integration of distributed energy generation systems based on renewable sources can be achieved with the availability of intelligent solutions, in particular, intelligent energy networks.

In general, it should be noted that distributed generation based on RES is a rather relevant phenomenon in modern electric power industry, which is confirmed by the experience of use in Denmark, Sweden, the USA, Norway and other countries. However, in Armenia, the concept of distributed generation also finds a synergistic response with the country's socio-economic development strategies. For example, back in 2016, according to a statistical study by the "Skolkovo" Innovation Center, the total installed capacity of power plants in Russia and neighboring countries reached 255 GW, of which about 237 GW is accounted for by centralized energy supply, represented by thermal power plants, hydraulic power plants, nuclear power plants and renewable energy sources [Klimovec, Zubakin, 2016, 11-16].

Distributed generation systems are widely used in the world. The "Skolkovo" Innovation Center conducted a study, as a result of which the relevance of distributed generation in the world was analyzed, which can be seen in figure 4:

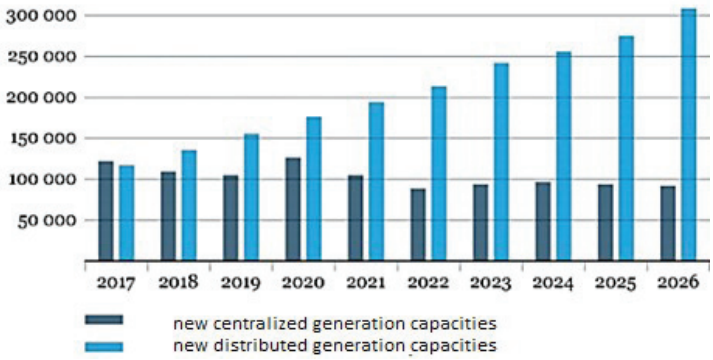

Figure 4. Forecast of commissioning of new capacities in the world, MW

As can be seen in fig. 4, by 2026 more and more distributed generation capacities will appear, but centralized generation and its capacities will gradually reduce their influence in the electric power industry. Moreover, the International Energy Agency assumes that after 2020 the world will begin a functional transition to greater use of renewable energy sources, which can be seen in figure 5 [Klipatsky, Amuzade, 2018, 21-27]:

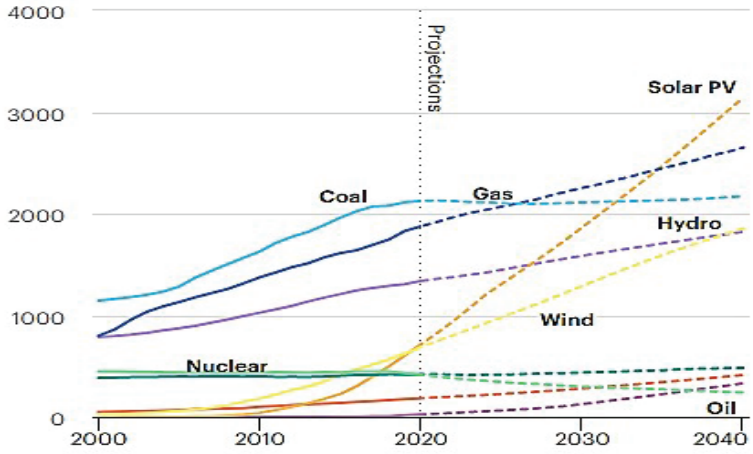

Figure 5. Installed generation capacity by source

Figure 5 shows the development scenario for 2000-2040, blue - coal, blue - natural gas, green - oil, turquoise - nuclear power, yellow - wind power, orange - solar power, red - other renewable sources, purple - hydropower, purple - rechargeable batteries.

Conclusions. Relative to the US and EU countries, the use of RES in agriculture in Armenia is at a low level. This situation can be explained by the availability of traditionnal fossil fuels. In parallel with this, one of the main barriers to the construction of large power plants based on renewable energy sources is the absence of a provision on an incentive tariff at which the state would buy electricity produced on the basis of renewable energy sources.

Modern progress in the energy field sets the trends for the development of the country's energy sector based on renewable energy sources in the context of the promising concept of a "smart" energy system. The Government of Armenia regularly allocates funds to study issues related to "green energy" and its use in agriculture that is, the generation of energy based on renewable sources, the type of generation of which leads to the development of the concept of distributed energy and, as a result, is able to provide prerequisites for the promising development of agriculture economy of the country.

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Promising development of the agro-industrial complex based on the integration of alternative energy sources
Key words. agro-industrial complex, agriculture, alternative energy sources, economic system, development

The presented work highlights in more detail one of the most pressing issues in the field of the agricultural complex of Armenia, associated with its development based on the integration of alternative energy sources. The economic development of the agro-industrial complex is highly relevant today. This factor is connected with the fact that this complex is the most important part of the modern economic system through which the modern population is provided with food. The main purpose of this article is to study the development of the agro-industrial complex through the development and implementation of alternative energy sources. The author works through the application of theoretical and statistical research methods. The work also uses scientific materials of foreign and domestic authorship. The main subtasks of this article are the study of the following aspects: the relevance of the development of the energy sector; the main components of alternative sources of energy; analysis of alternative energy sources; features of non-traditional energy sources; relevance and efficiency of integration of alternative energy sources in the agro-industrial complex of Armenia; necessity of development of distributed energy generation. The author analyzes not only the current situation around the presented issue, but also makes a prediction of the development of the issue for the coming decades.

THE ECONOMY DEVELOPMENT WITH RATIONAL MONEY MANAGEMENT AT THE EXPENSE OF CASH PAYMENTS

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Key words: monetary policy, non-cash payments, interest rate, means of payment, bank cards, payment and settlement system, issue

Introduction. The modern world economy is characterized by the transition from cash transactions to non-cash transactions. In recent years, the global economy, especially after the outbreak of COVID-19, has seen a sharp increase in non-cash transactions through the use of payment instruments. Based on the above, the research work is based on the transformation of the use of cash into non-cash, which will significantly change the control and management of the money supply in the economy, as well as the speed of the money supply cycle.

Currently, in parallel with the rapidly developing payment and settlement services, the relevant standards and criteria should be developed, which will be based on payments made by bank POS and virtual POS terminals, payment cards and ATMs. It should be added that in addition to making non-cash or cash payments through payment transactions, the process of resolving disputes over payment transactions (cards or debit cards), unrealized / incorrectly executed, fraudulent and other transactions, is a resource-intensive process according to the rules of the given payment system, for example ArCa, VISA, MasterCard, etc. [VISA, 11]. Despite all this, we did not exclude payments made by electronic payment orders during the study, as the latter constitute a large share ensuring the implementation of payments / transfers between legal entities / individual entrepreneurs.

Methodology. The theoretical, informational and methodological basis for the research was the legal acts and norms in force in the Republic of Armenia, websites and materials published by local and international payment and settlement organizations for making non-cash payments by payment instruments, domestic and foreign professional literature, published by the Central Bank of the RA and the Statistical Committee of the RA, etc. Statistical and logical, tabular, computational, comparative, systematic and other methods were used during the research. In the Table 2, 2020 is calculated as reflected in the database "Transfers made in the banking system through non-cash payment instruments in the territory of the Republic of Armenia", published by the Central Bank of Armenia. The average index of the two quarters is calculated on the principle of four quarters, as the data does not include 2020 database starting from the third quarter.

Literature review. The object of research is cash and non-cash money in the economy, its impact on money circulation, ATMs served by banks, POS terminals, payment cards, electronic payment orders. A key factor for the development of non-cash transactions is that businesses are interested in making non-cash payments for services, labor and supplies, in which POS terminals provided by commercial banks have a special place. However, businesses do not fully use this method, as there are no incentives for non-cash payments; for example, reduction of the tax interest rate for non-cash payments. The main purpose of the study is to reveal the effectiveness of non-cash and cash transactions. In order to achieve the mentioned goal, we have proposed the following problems: the problem of the possibility of non-cash money, the impact of the latter on cash monetary policy instruments as a result of the transition from cash to non-cash money. In his book "Money Market. Banking System and Monetary Policy", V. Ordukhanyan reflects that the components of money supply are cash and payment deposits, which are a debt or a payment obligation. The first case is the debt obligations of the Central Bank, and the second is the debt obligations of commercial banks and saving institutions. In his book "Finance, Money Circulation and Credits", L. Badanyan comments on the money system mainly in the form of cash flow, commenting very briefly on the circulation of money through non-cash accounts, which is currently a necessary factor for controlling money in monetary policy. Non-cash means of payment are also very briefly referred to in Ghazaryan's book "Payment and Settlement System", in which, despite the fact that there are non-refundable non-cash transactions and bank cards, there is no reference to them through rational money management or interest rate stability mechanisms of monetary policy transactions.

***Analysis*.** In the conditions of the modern economy, money, as the main category of the commodity economy, appears in the economy both in the form of cash transacttions and non-cash transactions [CBA, the essence of money aggregators and the application scopes, 1]. Central Bank's money issue, which is the issue of securities or currency at a certain point in time, due to the issue, the money supply in the economy is increasing, through which the Central Banks are carrying out their main task - to achieve price stability. The issue can be both cash and non-cash. If cash is issued by the Central Bank, then non-cash is issued by the banking system.

In the Republic of Armenia, the majority of non-cash payments are made through payment orders (one of the reasons is that most businesses use bank business cards less), and the rest through other tools; such as receivables, checks, payment cards and recently also e-money. However, most of the recent transactions with e-money are a combination of a virtual POS terminal for depositing money into the account of an electronic money issuer, in which case a transaction is carried out through a virtual POS terminal – payment card acquiring, on the other - non-cash payment by a payment card. In the context

of all this, we have not considered the volumes of payments with electronic money in a separate way, as they are the card transactions, which are already reflected in the volumes of non-cash payments with payment cards.

Non-cash transactions have the following advantages:

- They are fast moving, that is why the compensation for the purchase both "national" and "international" services, goods and works is carried out in seconds or in a few days. For example, international SWIFT payment orders are processed in a matter of days, depending on circumstances, even if they are through intermediary banks; or international local P2P transfers, which take seconds depending on the time of a day and geographical location, the international P2Ps are also processed in the same way (a transaction, during which two people immediately transfer from one payment instrument to another,in the Republic of Armenia it is known as C2C (Card2Card)Transfers).
- Do not cause physical loss.
- Theft of money.
- Counterfeiting money, etc.

Through the implementation of non-cash transactions, the circulation of money in the economy becomes completely controllable, which implies control over the money: exchanged or provided between its two or more participants.

The transition from traditional money circulation (in coins, banknotes) to non-cash or electronic transfers implies control over the free money supply in the economy, the use of free non-cash money (eg. bank demand, time deposits), refinancing, monetary instrument for the purposes of market participation, liquidity management (Securing daily money demand and liquidity by banks through repo agreements or foreign exchange swaps), etc. In addition, the transfer of cash to non-cash circulation facilitates the mandatory transfer of free cash from cash to bank accounts in the form of non-cash (restrictions on cash transactions also have a major impact on cash to non-cash transfers), which contributes to the best way of ensuring the transparency of turnover by economic entities, which also ensures the control of the base for tax revenues of the state budget.

In the context of all this, a big factor in accelerating the cashless circulation is the implementation of non-cash payments through the use of payment instruments, the acquisition of services, works or goods by consumers, which are directly credited to the bank accounts of businesses or service providers through final settlement and clearing. Clearing is the process of collecting, grouping, exchanging payment documents, as well as calculating the positions of the participants of the payment system for the final settlement or including a part of them, and the final settlement is an action, which has settled liabilities [Law, 2005. 3]. The types of property by considered currency in the Republic of Armenia are the currency of the Republic of Armenia payment securities denominated in currency, foreign currency (foreign currency) payment securities denominated in

them, bank's golds, rights and liabilities arising from the currency values and liabilities of the latter expression [Law, 2005, 4]. In order to carry out cash transactions, a corresponding amount of cash is required, for the provision of which, in addition to the resources involved, the banks attract financial resources from the Central Bank of Armenia by implementing monetary policy instruments. For instance, the corresponding amount of money in the lending or cashing devices (the amounts in the devices are recorded as cash on the way, until they are not cashed as a result of the use of payment instruments, as a result of which they are not reflected in the banks' software) to ensure the attraction of funds, which was in 14.12.2021. As of today, it was 6,25% per year. In other words, we can say that the cost of the resource involved in securing cash was only at least 6,25% in terms of involvement, which does not include the cost of collection services for the performance of work (for example, banknotes and / or coins), counting, resource payments, etc. In case of non-cash payments, there is generally no attraction of additional funds, as the person ordering the payment has money invested in the bank at least in the form of a demand deposit, collection of expenses, accrual of money, etc. Looking at 2017-2021, we see that the cost of securing money by financial institutions has decreased year by year, especially from September 2020 to December 2021. In December, interest rates for raising money again increased, as a result of which banks incur higher costs for cashing on demand funds (for example, funds available on banking payment cards). The same is true of pawn repo refinancing rates (see interest rates in Table 1).

Currently, the execution of transactions with payment orders has become so automated and improved (bank payment applications, payment instruments, etc.), that for the implementation of orders the labor resource fees are being reduced day by day.

In the context of all this, it is a possible circumstance that the majority of the population will make most of the payments through non-cash methods, in which case the "fundraising" cash will not be that sensitive for financial organizations, especially banks, as it is now.

The impact of non-cash money on the economy is to reduce the cost of printing banknotes in national currency, reducing the cost of minting coins, destroying cash banknotes, reducing the risk of embezzlement and the risk of counterfeit currency (According to the "Procedure on installation, operation and implementation of financial transactions through automatic self-service devices" approved by the Board of the Central Bank of the Republic of Armenia, all automatic financial operations equipment must be equipped with inking systems. In case of theft or damage to equipment, the money in the cassettes must be inked, which, although not subject to replacement until January 1, 2022, are not considered obsolete, replaceable amounts in accordance with Regulation 9 of the Central Bank of the RA. In this case, too, there was a risk of banknote damage) [CBA, 2011, 3 and CBA, 2016, 5]. In the case of non-cash currency, counterfeit non-

cash money is almost ruled out, as banks provide cash conversion into non-cash, and both the payment and settlement system ensures non-cash transfers, payments, which are based on certification (authorization). Non-cash payments reduce the costs of issuing and maintaining money in the country, as well as reducing the costs incurred by one of the parties to the application of monetary policy tools. Despite the decision N 190 on 21.12.2021 by the Board of the Central Bank of the Republic of Armenia, as a result of the operation of ATMs, the inked banknotes were subject to return to the Central Bank of Armenia until 2022, on January 1, which could be placed in the economy in the form of loans [CBA, 2022, 2].

Table 1. Interest rates published by the monetary policy provided by the Central Bank of Armenia

Date of setting	Deposite date	Lombard repo rate	Refinancing rate
14/12/2021	6.25%	9.25%	7.75%
14/09/2021	5.75%	8.75%	7.25%
03/08/2021	5.50%	8.50%	7.00%
15/06/2021	5.00%	8.00%	6.50%
04/05/2021	4.50%	7.50%	6.00%
02/02/2021	4.00%	7.00%	5.50%
15/12/2020	3.75%	6.75%	5.25%
15/09/2020	2.75%	5.75%	4.25%
16/06/2020	3.00%	6.00%	4.50%
28/04/2020	3.50%	6.50%	5.00%
17/03/2020	3.75%	6.75%	5.25%
10/09/2019	4.00%	7.00%	5.50%
29/01/2019	4.25%	7.25%	5.75%
14/02/2017	4.50%	7.50%	6.00%
27/12/2016	4.75%	7.75%	6.25%
15/11/2016	5.00%	8.00%	6.50%
27/09/2016	5.25%	8.25%	6.75%

Although it is as a result of the use of Monetary policy tools that they are "forced" to enter into contracts with the main bank to manage their liquidity and foreign exchange positions, non-cash incentives and incentives for financial institutions, such as banks, reduce Monetary policy spending itself. Finally, due to non-cash money, the volumes of "currency" and "foreign currency" in the economy are regulated and controlled, which is very important for the management of state reserves. In this context, we can say that independent money is the best mechanism to understand the more refined supply of money in the national economy, as a result of which the Central Bank of Armenia will sensitively consider the possibility of achieving targeted inflation, during which the toolkit was changed 5 times (taking into account all equal conditions), and in 2021 6 times during 12 months. We believe that the stability of interest rates on Monetary policy instruments will ensure a reduction in the bank interest rate, which has a significant impact on the deposit interest rates and, why not, on the reserve interest rate.

General analysis of cash and non-cash transactions. As we know, in the theory of economics, money has no clear or common definition. The inclusion of this or that financial instrument in the aggregators of money or, in other words, the definition of money circulating in the economy is closely related to the functions of money in economic processes. The following functions can be distinguished with money:

- Value size function,
- Circulation tool function,
- Accumulation or saving function [Ghushchyan, 2005, 439].

In order to understand the picture of cash and non-cash payments through payment systems, we have considered the statistical data published by the Central Bank of Armenia. Studies show that transactions are carried out in the following ways:

- Payments by electronic payment orders,
- Checks, payments with electronic money and non-cash card transactions,
- Payments by other debit instruments (data on the latter is not avai-lable).

Table 2. Transfers in the banking system through payment instruments in the territory of the Republic of Armenia in 2014-2019.

Types of payments	2014	2015	2016	2017	2018	2019	2020	Changes of 2020 regarding 2014	
								Absol.	Rel.
E-pays with orders									
Volume (tril. AMD)	18.30	19.61	21.96	24.19	23.64	31.15	29.09	10.80	59%
Quantity	9.76	11.76	14.00	15.71	18.70	22.52	25.99	16.23	166%
With checks									
Volume (tril. AMD)	0.007	0.012	0.005	0.009	0.018	0.003	0.005	-0.002	-26%
Quantity	0.004	0.006	0.002	0.005	0.014	0.002	0.001	-0.003	-82%
With other debit tools									
Volume (tril. AMD)	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Quantity	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Non-Cash card trans.									
Volume (tril. AMD)	0.13	0.17	0.22	0.27	0.40	0.60	0.70	0.57	432%
Quantity	4.57	6.11	8.20	11.00	18.01	31.15	41.84	37.28	817%
Total									
Volume (tril. AMD)	18.44	19.78	22.19	24.47	24.06	31.76	29.80	11.36	62%
Quantity	14.32	17.87	22.20	26.71	36.73	53.67	67.83	53.51	374%
Card transaction									
Volume (tril. AMD)	1.28	1.36	1.38	1.56	1.86	2.41	2.42	1.14	90%
Quantity	24.83	27.94	30.00	34.82	45.13	65.42	75.61	50.78	205%
Cash card trans.									
Volume (tril. AMD)	1.14	1.20	1.16	1.29	1.47	1.81	1.72	0.57	50%
Quantity	20.26	21.84	21.80	23.82	27.11	34.27	33.76	13.50	67%

We have observed the study period 2014-2019 (Table 2), and to get the indicator picture for 2020 (only the data of the first two quarters of 2020 are published), we have calculated 2020 average annual result for 2020 published in the calculation of 2 quarters in 2020. A clear analysis of this indicator is not very appropriate, as there was a Lock

Down in the economy due to the Covid 19 pandemic, and a 44-day war since September, which had a significant impact on the economy. However, in 2020 we tried to reach 2014 by calculation changes in payments made through payment instruments relative to 2020 in absolute relative terms. As a result of the study of Table 2, we observe the transactions in 2020 with electronic payment orders in 2014. Compared to the previous year, payments by checks increased up to 10,8 trilion drams or about 59%, payments by checks decreased up to 0.002 trilion drams or about 26%, the volume of non-cash card transactions increased up to 0,8 trilion drams or about 532%. As a result, in 2014, cashless transactions were increased by a total of 11,36 trilion drams or about 62%. Having the volume of non-cash and total card transactions, at the end of the table we have calculated the volume of cash transactions with cards and last changes of 2020 regarding 2014. As a result, the volume of cash transactions with 2020 cards in 2014 was increased by 0,5 trilion drams or about 50%. Despite the fact that the dynamics of the indicators of the table show that in 2018 there was a sharp increase in non-cash payments, the amount of cash is still growing dynamically.

Scientific novelty. In the context of the above-mentioned study, we use the following scientific novelty in case of installation of non-cash payment devices and POS terminals in the regions of the Republic of Armenia. Activated licenses for servicing payment cards in cash registers allow banks to make deductions from the profit tax base in the amount of the acquisition cost, as long as they are not subject to use in the amount of their carrying amount or at a certain point in time. Do not charge commissions from businesses during this period. In the context of this proposal, the Central Bank of the Republic of Armenia should set the balance values of POS terminals for the applicable period by Regulation N2 not to reduce by more than 25% of the capital balance, but also to define clear directions of use in the amount of their values, otherwise apply the deductions defined by the Regulation.

Another new approach that will regulate the provision of tools for servicing payment instruments for independent payments. All the persons who will register organizations or become individual entrepreneurs in case of using cash register devices depending on the sector, as they apply to open accounts in Armenian banks, should apply in the same way to activate the corresponding functionality of POS terminals in cash registers. In order to ensure the control part of the latter, as an announcement on the activity is submitted to the RA State Revenue Committee, for example number 201; "Declaration on being considered a turnover taxpayer", in the same way, within 20 days, submit an announcement on the possibility of servicing payment cards, which will provide tools for businesses to service non-cash funds very quickly.

Conclusion. As a result of the research, we have proved that to the extent that non-cash transactions develop in Armenia, the volume of cash transactions does not decrease

at the same time. This is considered by us in the context of 2020. According to the Labor Code of the Republic of Armenia, since January 2012, economic entities with more than 10 employees are obliged to pay their salaries non-cash, which resulted in an increase in the volume of cash withdrawals made by individuals and an increase in the number of transactions. The latter does not have a completely positive impact on the financial market, as banks are required to provide additional cash at branch cash registers and / or ATMs, particularly ATMs.

Increasing the volume of non-cash transactions and reducing the volume of cash transactions will lead to the effectiveness of money supply control, which will regulate the more flexible use of Monetary policy instruments and change the interest rate inferquently.

Despite the increase in non-cash payments in the economy, cash operations continue to grow dynamically, to reduce which we propose to make a systematic investment of non-cash payments in the regions of Armenia, which will reduce cash flow, which will lead to more targeted use of resources, Monetary policy tools, such as loans, which will also create added value within the economy. In the context of all this, there may be regulations in the legislation, which will lead to a smooth transition from cash to non-cash, especially with a limit on the one-day amount of cash.

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The economy development with rational money management at the expense of cash payments

Key words: monetary policy, non-cash payments, interest rate, money supply, means of payment, bank cards, payment and settlement system, issue, speed of money circulation, GDP

The purpose of the article is to ensure the stability of interest rates on monetary policy transactions in Armenia through cash and non-cash money, which will directly lead to the clarification of interest rates on monetary policy transactions and not monthly fluctuations. Research shows that the development / promotion of non-cash payments will not only stabilize the resource savings of its users within the economy, but will also lead to control of transparency, almost the entire amount of money circulation, as well as curbing the risk of cash temptation, embezzlement or similar. In the study, we found that, in case of non-cash transactions, transition from cash to non-cash has an impact on the monetary policy, the provision of financial resources by the financial institutions of the economy. In addition, the minimum provision for devices for the use of non-cash payment instruments by businesses is a very important circumstance, which we have presented as a novelty in several regulatory areas in the conclusion of the article.
As a result of the research, we have identified the following scientific innovations: not to deduct more than 25% of the POS terminals acquired by banks for the service of non-cash payments, not in operation, but to set clear directions for the use of these funds. The other new approach is for all businesses; to apply to banks for providing POS terminals or similar functionalities at cash registers, as well as to register bank accounts depending on the industry, and at the same time submit a statement to the State Revenue Committee within 20 days.

EEU ACTIVITY IN CONDITIONS OF CORONAVIRUS

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Keywords. Coronavirus, epidemic, crisis, integration union, EAEU economy

Introduction. The Eurasian Economic Union (EEU) is an international organization for regional economic integration. It has international legal personality and is established by the Treaty on the Eurasian Economic Union. The Member-States of the Union are Russian Federation (since January 1st, 2015), the Republic of Belarus (since January 1st, 2015), the Republic of Kazakhstan (since January 1st, 2015), the Republic of Armenia (since January 2nd, 2015) and the Kyrgyz Republic (since August 12th, 2015). The Union is being created to comprehensively upgrade, raise the competitiveness of and cooperation between the national economies, and to promote stable development in order to raise the living standards of nations in the member-states [EEU, 2015-2022].

The economic crisis caused by the Coronavirus pandemic (COVID-19) is the first serious challenge in the 6-year history of the EEU, as a result of which the Union will either collapse in the face of the crisis or withstand the negative effects of the crisis, overcome it and pass to a qualitatively new level of development with the more stable and secure elements.

Scientific novelty. the main issues and options are defined for correction of the plan of priority measures for the sustainable economic development and social stability of EEU and its member states in conditions of coronavirus. Conducted study has also practical significance: in our opinion the application of the proposed measures may improve anti-crisis management in the EEU macroeconomy.

Research methodology. The theoretical and methodological basis for the research has been the studies of domestic and foreign authors on different aspects of the impact of the coronavirus on the economy of the Eurasian Economic Union, as well as statistical and analytical materials published by various specialized international organizations (International Monetary Fund, The World Bank, etc.), research and analysis conducted by foreign research centers and experts. The analysis was carried out in several directions, revealing the development trends of the EEU economy before and during the epide-mic. The methods of observation, comparison, statistical analysis, generalization and prediction were used during the research. The indicators were mainly used in the form of comparisons for individual EEU member states.

At the meantime, it should be noted that the conclusions made may not be entirely substantiated, as the epidemic continues to spread and various restrictions due to the epi-

demic still exist, which are the basis for the continuation of the crisis. In addition, the epidemic is characterized by a high level of uncertainty (for example, new variants of coronavirus appear). It should also be taken into account that many anti-crisis measures have not registered their final results yet, which is due to their timeliness.

Literature review. It is no coincidence that many researchers are wondering what will happen to the integration unions after the epidemic. Of course, it is impossible to give a clear answer. A study of publications on this topic shows that the opinions of experts are quite different. First group of experts believes that the epidemic will weaken some integration units (D. Istafyov) or even lead to the collapse (Soros, Pshinichnikov), the second group is sure that after the epidemic all ties will be fully restored (Pritchin), and the third group believes that the integration units will be preserved, but they are expected to test the stability and security of the elements of that system (Rekeda) [Slutsky, Khudorenko, 2020, 123-124.]

The goal of this article is to analyze the impact of the epidemic on the economies of the EEU and its member states. The topic of the research is important to the extent that Armenia is an EEU member state and its economic policy, and especially its anti-crisis policy, is influenced by the policies implemented in the other member states.

Analysis. Prior to the epidemic, the economic indicators of the EEU member states showed mainly positive dynamics. Thus, in 2019, there was an increase in mutual and foreign trade volumes, the growth rates of production and agricultural products increased. GDP growth was observed in the EEU and individual member states (Armenia, Kazakhstan, Kyrgyzstan) (see Table 1). An attempt was made to ensure the free movement of goods, services, labor and capital in the union[1].

Table 1. GDP growth rate of EEU member states in 2015-2019

Country	GDP growth rate, annual %				
	2015	2016	2017	2018	2019
Russia	-1.97	0.19	1.83	2.81	2.03
Belarus	-3.83	-2.53	2.53	3.15	1.4
Kazakhstan	1.2	1.1	4.1	4.1	4.5
Armenia	3.2	0.2	7.5	5.2	7.6
Kyrgyzstan	3.88	4.34	4.74	3.76	4.6

The EEU, however, is not developing without obstacles. It is influenced by factors such as international and regional shocks, various sanctions, crisis phenomena and the slowdown in global economic growth. The union is also not free from internal contradic-

[1] http://special.kremlin.ru/events/president/news/60597

tions, which are mainly manifested in the form of short-term economic imperatives that are higher than the common interest. For example, according to the Eurasian Economic Commission, as of the end of March 2019, 71 obstacles were calculated, which complicate the work of the EEU common market. However, these problems are natural phenomena for the integration unions that are still being formed and they are even some necessary elements for development.

As it is well known, since the beginning of 2020 the world contracted the coronavirus, which quickly spread to all countries, leading to an increase in mortality rates and a crisis in the health care system, which in turn led to an economic crisis. Areshkin distinguishes the following features of the epidemic [Oreshkin, 2020, 3]

1. Widespread impact - the virus affects all countries of the world.
2. High impact speed - The spread speed of Covid-19 is quite high. It has spread all over the world in almost a few months.
3. The decline of world GDP. Restrictions to prevent the spread of the virus reduce the GDP of almost all countries in the world by an average of 2% per month, and international trade is reduced by 15% -35% [Eurasian commission, 2020]. Slutsky and Khudorenko added the following to the above [Slutsky, Khudorenko, 2020, 125-126].
4. Systemic impact. The virus affects all aspects of human life.
5. Increasing the role of state regulation. It is possible to overcome the epidemic through joint efforts, coordinated activities and justified, comprehensive anti-crisis measures implemented by the state.
6. Strengthening the role and significance of science. This primarily applies to medicine, biology and the system of social relations.
7. Extremely high rates of digitalization of communications.
8. Effective management has become a factor of international competitiveness. The integrity of national, regional and international systems depends on the quality and results of governance.
9. The Internet is becoming a basic human need, which transforms the surrounding reality. It has already led to changes in the content of work and education (e.g. the transition to the remote version).

All these factors, of course, affect the activities of the EEU, but in order to assess the impact of the epidemic, it is also necessary to take into account the external and internal risks. External risks include

1. Weakening of EU economic activity. In this regard, it should be noted that on the one hand the EU is a unique model for the EEU and the EEU leadership is guided by its experience and mistakes, on the other hand it is the largest economic partner of the EEU and its problems also affect the EEU [Tass, 2020].
2. China's economic slowdown. For the first time since 1992, China's GDP in the first quarter of 2020 fell by 6.8% compared to the previous year [Reuters, 2020].

3. The decline in demand for goods on the commodity exchange due to falling oil prices. This is a very sensitive issue, especially for the two main oil giants of the EEU, Russia and Kazakhstan, whose economic development is directly linked to the effective operation of one of the main sources of rental capital, the hydrocarbon economy [Eurasian commission, 2020].

These are some important internal factors influencing the EEU:

1. The deepening economic crisis in the member states. The situation created by the epidemic disrupts various economic processes.

2. Migration issues, which are also quite important for the EEU member states. In parallel with the development of the EEU, labor relations between the countries are developing. As a result of the spread of the epidemic, the closure of borders and quarantine restrictions have led to a relatively poor state of migrant workers, which in turn has increased unemployment, required additional resources and may have led to increased social tensions.

3. During the epidemic, problems began to arise with the legal and legislative framework of the union. Weaknesses in the laws governing economic and production relations between the countries, weakness of the logistics nodes and shortcomings of the mechanisms of financial transactions were observed in the union.

As we can see, in the conditions of the epidemic, the EEU has some problems that it naturally has had before the epidemic. All the listed internal problems are solvable and are being solved at present, and their existence speaks of the "viability" of the union, and overcoming them is the basis for development and improvement. It is obvious that development is not possible without challenges. That is why the epidemic has such opportunities. Processes aimed at overcoming the above-mentioned internal risk factors are carried out both at the level of the EEU and at the level of individual member states. However, it should be taken into account that in the current situation the main problem for the EEU is the COVID-19 epidemic. Examining the history of the initial spread of the epidemic, we can note that in the early stages of the spread of the epidemic, almost all countries in the world were in some point isolated from each other to curb the spread of the disease, and of course, jointly coordinated processes to overcome the epidemic were practically absent. The EEU was no exception in this respect either. The next stage was the so-called exchange of experience, in which the integration unions try to implement joint arrangements in their member countries to minimize the impact of the epidemic and restore economic activity. The following can be distinguished from the main measures to overcome the consequences of the epidemic in the integration unions

- Information exchange
- Assistance to migrants in the process of repatriation
- Joint acquisition of drugs and medical equipment
- Ensuring continuity of reproduction

- Transition of non-paper documents-circulation in commercial processes
- Implementation of measures to promote the inflow of necessary goods (medicines, personal protective equipment, food supplies, etc.) during the epidemic, etc.

There are two main models of fighting the epidemic in the EEU countries. One is the "point" model in Belarus, and the other is the quarantine model in other countries. The Belarusian model is mainly aimed at maintaining and supporting the economy in times of crisis. The quarantine restrictions are of maximum humanitarian nature, although they are costly and cause great damage to the economy. They are primarily aimed at restoring the normal living conditions of the population, as well as maintaining the principle of life and health. However, it should be noted that quarantine restrictions, closure of borders, traffic restrictions can only combat the effects of the already widespread epidemic. As the virus has no borders, there is a need for member states to take joint action. That is why the EEU policy strategy is to move from the damage caused by the virus to EEU states to creativity, which can be achieved through a joint fight against the virus.

In 2020, in the context of the coronavirus epidemic, the use of tools to regulate the foreign trade of medical and food products in the EEU member states ensured their security. Some of the measures taken were restrictive in nature and aimed at restricting the export of those goods, while others were aimed at providing conditions that would encourage the import of necessary goods in the event of an epidemic. The EEU member states imposed various non-tariff restrictions on exports, in particular:

- Export barriers. Belarus temporarily bans exports, arrangements for exports of personal protective equipment, disinfectants and protective materials, medical supplies and equipment,
- Quantitative restrictions on export demand used by Russia and Kazakhstan, for example, Russia imposed temporary quantitative restrictions on grain exports;
- Export authorization procedure. This implies obtaining an export license or permition for goods subject to restrictions, for example, Armenia has applied this to medical products.

Measures to ban or restrict imports were also taken. It is important to note that during the first peak of the coronavirus epidemic, Member States took uncoordinated action in relation to trade in the Union, which created additional barriers. Thus, Armenia demanded that drivers entering the country isolate themselves, Belarus restricted the duration of transit (road transport in case of transit through Belarus had to leave its territory no later than the next day after entry). As part of the simplification of trade procedures, two groups of tariff incentives were introduced at the EEU level in the form of complete exemption from import duties (related to imported special (critical) goods and imported goods preventing the spread of coronavirus infection).

The EEU member states have taken measures to simplify trade procedures at the national level. The operation of "green corridors" has become a widespread practice, which allows national participants in foreign economic activity to avoid certain customs formalities and to immediately clear customs of imported goods. For example, in Kazakhstan, the "green corridor" exempted importers of socially important goods from inspection, expertise and customs control. A "green corridor" has been opened in Russia for basic necessities and food. The customs authorities should ensure the priority procedure for customs clearance of such goods, expediting their release for free circulation.

In some EEU member states, the tax burden on participants in foreign economic activity has been reduced. For example, in order to stabilize the food market and the agro-industrial complex in the face of the epidemic, the Republic of Kazakhstan introduced tax privileges, which reduced the rates of VAT on the import of socially significant food products and biological assets of the agro-industrial complex. In the framework of the fight against coronavirus, on March 19th, 2020 a "Coordinating Council" was set up to monitor the selection of measures to prevent the spread of coronavirus and measures of emergency response. The Council exchanges information between the member states of the Union. The session of the Supreme Eurasian Economic Council took place on April 14, 2020, as a result of which it was decided to implement the following measures:

- Strengthening the healthcare system, conducting joint scientific research on virus detection, prevention, diagnosis and treatment;
- Monitoring and prevention of the spread of COVID-19 in the context of the principle of free movement of socially important goods, foodstuffs, medical and personal protective equipment,
- Strengthening economic cooperation between member countries, including reducing the impact of negative factors, gaining the ability to operate in world markets in conditions of uncertainty;
- Ensuring the stability of domestic markets, including exemption from export restrictions and duties on certain goods from the EEU
- Providing support to citizens, businesses through tax deferrals, credit vacations and other measures.

The willingness of the member states to cooperate and provide mutual assistance to the process in the context of the coronavirus, testifies to the success of the EEU as an integration union and that it has great potential for development. Below is the estimated cost of anti-crisis measures implemented by the EEU member states at the national level in 2020 [GDP growth, 2020].

Table 2. Estimated cost of anti-crisis measures in the EEU countries in 2020

Country	Economic growth in 2020, %	Estimated cost of anti-crisis measures	% Of nominal GDP in 2020
Armenia	-7.4	$ 300 million (150 bln AMD)	About 2.3
Belarus	-0.9	About $ 1 billion	About 1.6
Kazakhstan	-2.5	$ 10 billion	About 5.9
Kyrgyzstan	-8.62	$ 627 million	About 8.1
Russia	-2.95	$ 47 billion	About 3.2

The Government of the Republic of Armenia on March 16th, 2020 passed a resolution "on declaring a state of emergency in the Republic of Armenia." This resolution prohibited the implementation of certain types of economic activity, restricted the free movement of people and established a special procedure for the entry and exit of persons, vehicles, cargo, other property, animals and vehicles at all checkpoints of the RA state border. During the year the Government of the Republic of Armenia adopted and implemented 22 anti-crisis measures of economic and social nature.

Belarus initially refused to impose a quarantine regime, and limited resources did not allow for full anti-crisis measures. Therefore, the priority was given to supporting the public sector of the economy, which was also of a limited nature. However, there was no sharp decline in the economy. The President adopted a decree on economic support, which approved the anti-crisis program. It includes deferral of tax arrears, the right to reduce the property tax is given to local administrative and executive bodies, legal entities, sole proprietors, real estate owners, it is recommended to provide tenants with deferred rent. In order to simplify procurement procedures, buyers are given the right of public procurement from one source (to the extent necessary to meet demand within 2 months) if the contract with the former supplier is terminated, etc.

The government of Kazakhstan has developed a $ 10 billion anti-crisis package to mitigate the negative economic impact of the epidemic. The measures include support for enterprises, primarily SMEs, and households. The state will finance the increase of social protection measures, including subsidizing the payment of salaries and unemployment benefits and providing socially vulnerable citizens with food baskets.

The economic assistance measures of *Kyrgyzstan* are described as follows: On April 30th, 2020 the government adopted a new Act on Economic Freedom and Development, which aims to restore Kyrgyzstan's economic activity by $ 400 million, or 5.2% of GDP. The main goal of this event is to improve the business environment through further digitalization of the economy (non-cash payments), introduction of reasonable tariffs, launch of new infrastructure projects, new investment code, protection of private property rights, investor guarantees, privatization expansion and free movement of capi-

tal. On June 11, 2020, the "Financing of Entrepreneurs" program was approved. The implementation of this program is aimed at restoring and ensuring economic and social stability, supporting economic entities in the context of the spread of coronavirus infection. The priority business areas included in the Program are the areas within which the following factors are taken into account:

- Assistance in maintaining existing jobs and creating new jobs amid rising unemployment and the return of migrant workers.
- They are economically efficient business sectors to make the largest possible contribution to the country's GDP growth.
- They support business sectors, which have a multiplier effect on the development of other types of economic activity.
- They support export-oriented enterprises.
- They consider the need to improve the level of food security in the country.
- They provide the population and the healthcare system with home-made protective products and the most demanded medicines.

Under the program, soft loans will be provided for the following areas: tourism, light industry, pharmaceutical industry, cargo transportation, manufacturing and processing enterprises, including agro-industrial complex enterprises. The financial support of international institutions also has a great impact on the prevention and overcoming of the coronavirus.

In contrast to the lack of joint financial operations within the EEU and the CIS, international financial institutions were quick to respond to the threat of the COVID-19 epidemic to the world economy. The first loan to fight the effects of the epidemic was approved on February 20th, 2020. It was a 130 million yuan loan from the ADB to China [ADB projects, 2020]. To support the fight against the effects of the COVID-19 epidemic, the IMF, the ADB and the Asian Infrastructure Investment Bank (AIIB) became the largest lenders in the post-Soviet countries. The Ukraine ($ 5.1 billion), Kazakhstan ($ 1.8 billion), Uzbekistan ($ 1.0 billion) and Georgia ($ 0.9 billion) received the largest loans. In the case of Kyrgyzstan and Armenia, the amount of aid was the largest of the EEU countries, compared to the size of their economies - 4.1% and 2.6%, respectively. If we look at the ratio of loans received in 2019 to the country's GDP, Georgia (5.0%), Kyrgyzstan (3.9%), Ukraine (3.3%) and Tajikistan (3.2%) received the largest assistance. Russia, Turkmenistan and Azerbaijan (receiving only 3.5 million from the EBRD) did not receive financial assistance to combat the effects of COVID-19 [Posledstvia: Doklad IRIP VAVT, 25].

The actions of international financial institutions raise the issue of creating EEU's own financial assistance mechanism to help member states in emergency situations. It can be an independent new financial institution or previously created special programs

of the EEU institutes. Below information on the amount of financial support from the international financial organizations to the EEU member states on the impact of the COVID-19 epidemic is presented as of July 12, 2020.

Table 3. Financial assistance from international financial organizations to the EEU states to combat the consequences of the COVID-19 epidemic, million USD (12.07. 2020)

Country / International Finance Organization (IFO)[1]	AIIB	ADB	IMF	IBRD	EBRD	IDA	IFC	IDB	General loans from IFOs	The share of aid in GDP in 2019, %
Armenia	0	20	175	3	50	0	0	0	248	1.81
Belarus	0	0	0	101.7	30.5	0	25	0	157.2	0.25
Kazakhstan	750	1000	0	0	93.1	0	0	0	1843.1	1.02
Kyrgyzstan	0	70	242	0	0	21.1	0	15	348.15	4.12
Russia	0	0	0	0	0	0	0	0	0	0

Armenia*:* On May 18th, 2020, Armenia received a $ 175 million loan from the IMF at an annual interest rate of 1.3% to solve urgent economic and humanitarian problems in the country caused by COVID-19. The EBRD has signed a $ 20 million loan agreement with ACBA-Credit Agricole Bank CJSC (now ACBA Bank OJSC), for the Bank to use to raise funds to finance micro, small and medium-sized enterprises affected by the COVID-19 epidemic. The EBRD and the ADB have provided $ 25 million and $ 20 million in loans to Electric Networks of Armenia CJSC, respectively. The loans were intended to maintain the quality of reliable and uninterrupted services in the face of the negative economic impact of the COVID-19 epidemic. The EU, in turn, in April 2020 confirmed the assistance to Armenia for urgent and short-term needs in the amount of 92 million euros for the fight against the outbreak of the coronavirus. Areas of assistance are health, educational and socio-economic. This opened up additional fiscal space for the Government's health and anti-crisis measures and will be used to provide medical equipment and supplies, train medical staff and laboratory staff, support SMEs and the business community, and provide social and humanitarian assistance in the event of a coronavirus outbreak. The assistance consists of the reconstruction of some ongoing projects jointly with the EU and new targeted assistance programs. It should be noted that most of the support will be provided as budget support and will be directed to the implementation of support programs approved by the Government [Posledstvia: Doklad IRIP VAVT, 2020, 27-28].

Belarus: In April-June 2020, the Government of the Republic of Belarus requested assistance from international financial institutions to finance measures to combat the

[1] Note: AIIB - Asian Infrastructure Investment Bank; ADB - Asian Development Bank; IMF – international Monetary Fund[IBRD - International Bank for Reconstruction and Development; EBRD - European Bank for Reconstruction and Development; IDA - International Development Association; IFC - International Finance Corporation; IDB - Islamic Development Bank

spread of coronavirus. The republic can receive up to $ 2.5 billion from international financial institutions in the fight against COVID-19. Thus, at the end of June, Belarus placed $ 1.385 billion worth of government bonds in foreign financial markets. In addition, Belarus has received a $ 90 million loan from the World Bank for 11 years to quickly respond to the spread of COVID-19. The program helps to meet the urgent needs of medical equipment in the healthcare system, including providing the healthcare system with modern oxygen equipment, analgesics and antibiotics, as well as personal protective equipment for physicians. Funds will also be directed to measures to raise citizens' awareness of social distance and hygiene measures [Posledstvia: Doklad IRIP VAVT, 2020, 28-30].

Kazakhstan: The ADB has approved a $ 1 billion aid package to help the Kazakh government mitigate the social, economic and health effects of the COVID-19 epidemic. ADB's financial assistance supports a comprehensive health, social protection and employment, as well as economic recovery program developed by the government to mitigate the impact of the epidemic. The Asian Infrastructure Investment Bank, in turn, has provided a $ 750 million loan to Kazakhstan to combat the effects of the epidemic. The United States has provided $ 3.11 million in assistance to Kazakhstan, of which $ 1.5 million has been provided to strengthen the capacity of laboratories and medical staff to combat the spread and containment of COVID-19 [Posledstvia: Doklad IRIP VAVT, 2020, 31-32].

Kyrgyzstan: In total, the Kyrgyz Republic has received $ 627 million in grants and loans from international financial institutions. These funds will be mainly used to support the state budget (financing of protected expenditures, financing of healthcare expenditures), financing the purchase of medical supplies and medicines to fight COVID-19, implementing an epidemiological education program, as well as digitalization processes in the economy [Posledstvia: Doklad IRIP VAVT, 2020, 32-38].

Russia: The assistance was mainly provided as follows: The United States has provided oxygen apparatus to Russia for the Central Clinical Hospital, China has provided protective clothing, masks and other equipment, and a number of EEU and CIS countries have offered Russia to purchase protective kits and medical masks. Below is the change in GDP of the EEU member states (quarterly data of Kyrgyzstan are missing) during the epidemic (%, on a quarterly basis).

Table 4. The change of EEU member countries GDP during epidemic (%, quarterly, in terms of 2020 January - 2021 September)

Country	Month							
	2021-4	2021-5	2021-6	2021-7	2021-8	2021-9	2021-10	2021-11
Kyrgyzstan	-3.8	-1.6	-1.7	-1.6	-0.7	0.1	1.6	2.4

Table 5. Kyrgyzstan's GDP during COVID 19 (%, monthly, 2021 April - November)[1]

Country	Quarters						
	2020-I	2020-II	2020-III	2020-IV	2021-I	2021-II	2021-III
Armenia	4.2	-13.5	-8.7	-3.3	-3.3	13.3	2.7
Belarus	-0.2	-3.3	-0.2	-0.2	1.1	5.8	-
Kazakhstan	2.7	-1.8	-2.8	-2.6	-1.5	2.3	3.5
Russia	1.4	-7.8	-3.5	-1.8	-0.7	10.5	4

As can be seen from the data in the tables, the EEU member states have been recording positive dynamics of economic recovery since the second half of 2020. Starting from the second quarter of 2021, there are generally positive indicators of economic growth compared to the previous period, which is due to the easing of restrictions and the implementation of anti-crisis measures. However, in the third quarter, the economic activity of the Republic of Armenia weakened, which in turn was due to the high prevalence of coronavirus disease.

Conclusions. Thus, we can conclude that if before the epidemic integration processes were actively and purposefully carried out within the EEU, not only the quality of the integration processes, but also the security of the countries and the whole Union began to depend on the development of those processes. The way out of the ever-deepening crisis caused by COVID-19 requires serious efforts to overcome external and internal challenges and contradictions, which is extremely difficult, if not impossible, to do alone. The severity of the common problem pushes the states to get as close as possible. As the events have shown, the danger of the epidemic leads not to the secession of the EEU member states, but to the increase of their interconnectedness and, consequently, to cooperation in much larger volumes and spheres under the influence of constantly changing external and internal challenges and threats. Following the logic of the research, we can assume that after the epidemic there can be more favorable opportunities to further strengthen the ties between the EEU member states, and there will be opportunities to increase the integration within the union. Based on the above, we offer to implement

- measures aimed at coordinating the actions of the healthcare systems of the EEU member states and actively exchanging information;
- measures to regulate the labor market, we mean the protection of the rights of migrant workers, i.e. to ensure the return of migrants to their donor countries, regardless of restrictions on movement outside the country, and to ensure the normal living conditions of migrants in host countries, taking into account social and medical assistance;
- measures aimed at creating EEU's own financial assistance mechanism to help member states in emergency situations or in the process of economic development;

[1] https://www.theglobaleconomy.com/economies/

- measures to accelerate and simplify decision-making on administrative regulations at Union level (non-paper (electronic) paperwork, minimum level of face-to-face inspection and control procedures). It is important to simplify trade and customs regulation procedures (especially medicines, disease protection products, medical equipment) by moving them to a digital platform (e.g, customs clearance processes without paper media and personal contacts).

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EEU activity in conditions of coronavirus

Keywords. Coronavirus, epidemic, crisis, integration union, EAEU economy

In the current conditions, the coronavirus-caused epidemic has challenged the world economy and national economies, facing the fact of economic crisis. Creating a deep crisis, it carries risks of disrupting global and regional economies. According to the IMF, world GDP shrank by 3.1% in 2020, including by 4.5% in developed countries and 2.1% in developing countries. World trade in goods and services decreased by 8.2%. Although the global economy is already recovering in 2021, the coronavirus is still considered a serious threat. It is characterized by high rates of spread, which leads to the unpredictability of any impact. That's why scientists at Singapore University of Technology and Design recommend not making predictions about the epidemic, as traditional forecasting models designed to make accurate predictions now and in the future can lead to misunderstandings in extreme uncertainty. The Corona Crisis or the “Great Quarantine” can serve as a historical test of the “strength” of the economic space of the EEU states. The prospects for Eurasian integration largely depend on exogenous factors, primarily the coronavirus pandemic, and now each of the EAEU countries found itself in a unique epidemiological situation, despite the common zone of infection.

RA LABOR MARKET CHANGES IN THE CONTEXT OF THE COVID-19 PANDEMIC

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Key words: Covid-19, labor market, unemployment, quarantine restrictions, measures to neutralize the effects of the pandemic

Introduction. The Covid-19 pandemic, which began in late 2019, disrupted the normal movement of the world in the context of almost all infrastructures. The work of the governing bodies of the vast majority of countries around the world began to focus on solving the issues they faced in the shortest possible time and with effective means. Quarantine conditions and many restrictions on movement were introduced everywhere to reduce the spread of the pandemic. Both the pandemic and the various restrictions adopted by the governments disrupted normal economic activity in the countries: consumption decreased, investments in the number of sectors were reduced, export and import rates lost their intensity, etc. The rate of recovery of economic activity over time in each country of the world was manifested in very different ways, due to the outbreaks of Covid-19 at different times, which in its turn, brought backwardness in many areas. The programs initiated by governments were aimed not only at reducing the spread of the pandemic but also at reducing the losses that businesses and employees suffered from it. Given the fact that a large number of small and medium-sized businesses operate within the shadow economy, especially in developing countries, deprived of the opportunity to use these programs and reduce the expected losses and the latter could be used by many large businesses that didn't feel the need extremely. Armenia did also not refrain from this global pandemic and the many issues that arose as a result. Since the spread of Covid-19, a number of restrictions have been imposed on the activities of economic operators and employees in the country. This especially led to some changes in the RA labor market: many were forced to retire due to the economic restrictions imposed by the government and a large group became unemployed.

Literature review. Since the outbreak of the Covid-19 pandemic, the entire economic world has made a number of predictions, analyses about the expected breakthroughs in the world. Because the spread of the virus has been observed all over the world and not only in some countries, studies are being carried out at the level of both "individual countries" and the whole world. Thus, according to the International Labor Organization, the number of unemployed people in the world in 2022 will be 207 million, when the latter was only 186 million in 2019 [International Labor Organization, 2022, 13]. According to the same studies, the recovery of the labor market will be very

weak until 2023. Employment losses and loss of income from work were revealed especially in 2020 and 2021. Moreover, the groups of people who have always been considered vulnerable in the global labor market - women, young people, the elderly, migrants - have suffered greater employment losses than other groups. At the same time, studies in OECD member states show that the hours worked during the pandemic are relatively far from pre-crisis levels. March 2021 worked hours were still 7% below the level in December 2019 in about 10 countries [ELS, 2021, 8].

Methodology. The information of this study was obtained through various secondary sources like statistic reports, websites, articles. The mentioned statistical data are taken from the official statistics yearbooks and reports of the RA Statistical Committee. RA legal acts, government decisions, state budget execution reports, were studied. Statistical summarization, comparison, and time series analysis methods have been used.

Scientific novelty. The Covid-19 pandemic caused a number of issues and deviations from the normal existing direction in the context of almost all infrastructures from the beginning of its spread in Armenia. The labor market was not left out of all this, in which large-scale changes were observed, especially at the beginning of the spread of the pandemic. The latter will allow focusing on the types of economic activity facing bigger problems in the future. Since the beginning of the pandemic, many measures have been organized to neutralize its economic and social consequences. It is important to study these changes to find out their structure and directions as well as the effectiveness of those measures.

Analysis. After the detection of the first cases of Covid-19 pandemic, a state of emergency was declared in the Republic of Armenia on March 16, 2020, by Government decision N 298, which established numerous transport and economic restrictions within the territory of Armenia. These restrictions later underwent many changes due to the rate of spread of the pandemic. Thus, according to the N9 decision many activities such as casinos, movie screenings, shopping centers (except for food, beverages, alcoholic beverages, retail trade of tobacco products), bars, nightclubs, dance halls, bookmaker and betting service offices were banned in the whole territory of Armenia from March 23. Over time, subsequent decisions imposed restrictions on many other types of economic activities, including a number of economic operators. As a result, many lost their jobs or were temporarily out of work due to its inactivity, lost working hours, or started working from home. To understand the dynamics of the number of employees in the Republic of Armenia during that period, let us have a look at the data presented in Table 1, which contains the movement of the number of employees in 2019-2022 each month, separated by institutional sectors. From Table 1 it is visible see that a striking change in the number of employees in the country is visible in April 2020, when that number decreased by about 33,359 compared to the previous March. This was the period when the first cases

of infection with the Covid-19 began to be revealed in the country when the strict Isolation of infected persons and those who came in contact with the latter was mandatory.

Table 1. Number of employees in Armenia by institutional sectors of economy, 2019-2022 / person[1]

	2019			2020			2021		
Month	State	Non-state	Total	State	Non-state	Total	State	Non-state	Total
1.	200121	360491	560612	197711	402757	600468	202660	407767	610427
2.	201775	367523	569298	200454	414554	615008	204715	417577	622292
3.	201940	367510	569450	201091	417635	618726	206956	428841	635,797
4.	199908	388335	588243	198993	386374	585367	207614	431734	639,348
5.	199842	396876	596718	200372	407468	607840	207253	439959	647,212
6.	198166	403358	601524	202142	431038	633180	208051	447732	655,783
7.	196182	406835	603017	200674	432251	632925	203491	448904	652,395
8.	193690	408683	602373	198212	437581	635793	202152	452282	654,434
9.	199070	415389	614459	203339	445333	648672	208725	458050	666,775
10.	200717	419835	620552	201934	437583	639517	208507	458,710	667,217
11.	203584	421179	624763	203106	429672	632778	211258	460,294	671,552
12.	205834	421997	627831	204753	432633	637386	211146	460,823	671,969

Table 2 shows the change in the number of employees in each month (expressed as a percentage) compared to the previous month during each year. Here again, we see that the decrease in the number of employees is observed especially in April, October, November 2020, July 2021, as well as in January 2022, and in other periods the increase in the number of employees is mostly visible.

Table 2. The change in the number of RA employees compared to previous month, %[2]

	2019	**2020**	**2021**	**2022**
January		95.64	95.77	96.58
February	101.55	102.42	101.94	
March	100.03	100.60	102.17	
April	103.30	94.61	100.56	
May	101.44	103.84	101.23	
June	100.81	104.17	101.32	
July	100.25	99.96	99.48	
August	99.89	100.45	100.31	
September	102.01	102.03	101.89	
October	100.99	98.59	100.07	
November	100.68	98.95	100.65	
December	100.49	100.73	100.06	

[1] The table was compiled by the authors based on the data of the Statistical Committee of the RA.
[2] The table was compiled by the authors based on the data of the Statistical Committee of the RA.

Taking into account that 2020 and 2021 were under the influence of unpredictable and difficult-to-manage external factors, the number of employees can be compared with the same periods of 2019 to reveal the real dynamics of the local labor market (Table 3).

Table 3. The change in the number of RA employees in 2020, 2021, and 2022 compared to the same period of 2019 /%[1]

	2020/2019	2021/2019	2022/2019
January	107.11	108.89	115.77
February	108.03	109.31	-
March	108.65	111.65	-
April	99.51	108.69	-
May	101.86	108.46	-
June	105.26	109.02	-
July	104.96	108.19	-
August	105.55	108.64	-
September	105.57	108.51	-
October	103.06	107.52	-
November	101.28	107.49	-
December	101.52	107.03	-

It is clear that the net number of employees has increased in the vast majority of months (except April 2020), which, in fact, shows a positive trend, stating that despite the pandemic and the existing restrictions, labor market activity has been quite high. However, if we compare everything with the movement of Covid-19 infected people in Armenia from February 2020 to February 2022, we see that there is almost no time connection between the latter and the number of employees in the country: during large surges in the number of infected people, there is no general decrease in the number of employees during the same period (see Figure 1). The main coincidence is noticeable in January 2022, when the total number of employees in both state and non-state sectors decreased significantly. And June 2020, November 2020, April 2021, and October 2021, accepting the highest rates of the number of infected people in a short period, during which the Government again imposed many restrictions, did not ensure a reduction in the number of employees compared to previous periods. Observing the level of officially registered unemployment in the Republic of Armenia, it is noticeable that the latter was much higher during a long period in 2021 than the 2020 index. The number of unemployed from January to August 2021 (inclusive) exceeds the number for the same period in 2020 (see Figure 2). However, in 2020, 2021, the unemployment rate did not exceed

[1] The table was compiled by the authors based on the data of the Statistical Committee of the RA.

the index in the corresponding month of 2019. Therefore, it can be assumed that no deep crisis took place in the RA labor market.

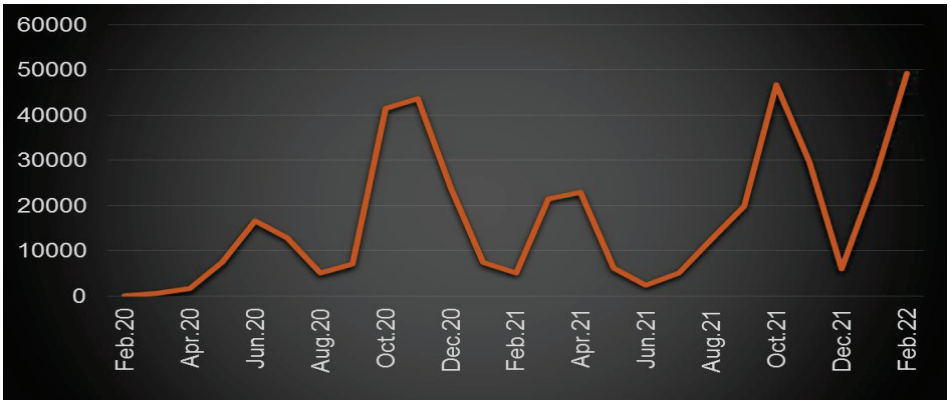

Figure 1. The trend of the number of people infected with Covid-19 in Armenia, February 2020 - February 2022 / person[1]

But differences in changes in the unemployment rate by sex are observed in 2020 and 2021 (see Table 3). The dynamics are noticeable especially in 2020 with the increase of the unemployment rate among men, which is visible in all months except April and June, while the increase in the unemployment rate of women in the same period was registered only in October, November and December (see Table 3).

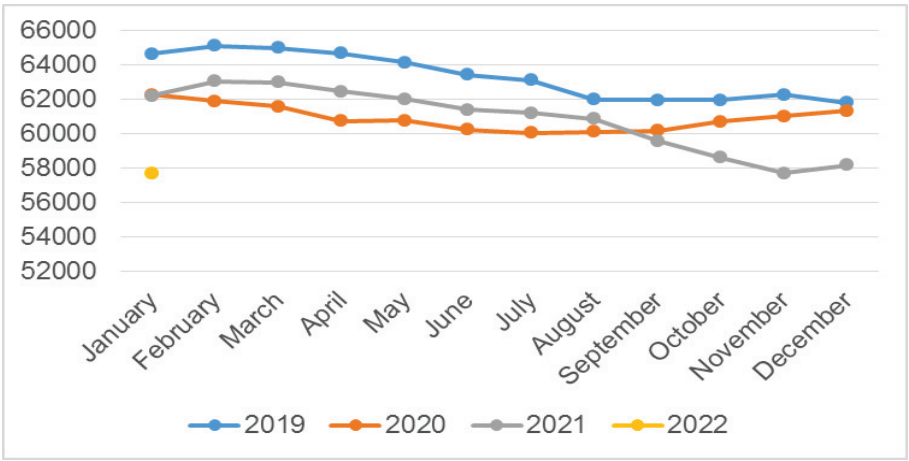

Figure 2. Dynamic of the unemployment rate in Armenia, 2019-2022[2]

[1] The table was compiled by the authors based on the data of Ministry of Health of the RA.
[2] The table was compiled by the authors based on the data of the Statistical Committee of the RA.

Table 3. Dynamic of the number of unemployed in Armenia by gender, 2019-2022[1]

Months	2020	2021	2022	Change compared to the previous month 2020 /%	Change compared to the previous month 2021 /%	2020	2021	2022	Change compared to the previous month 2020 /%	Change compared to the previous month 2021 /%
1.	41296	40226	37000			20946	21967	20692		
2.	40872	40804		98.97	101.44	21000	22219		100.26	101.15
3.	40477	40738		99.03	99.84	21080	22236		100.38	100.08
4.	39975	40420		98.76	99.22	20733	22027		98.35	99.06
5.	39960	40220		99.96	99.51	20791	21735		100.28	98.67
6.	39711	39841		99.38	99.06	20512	21515		98.66	98.99
7.	39387	39670		99.18	99.57	20641	21506		100.63	99.96
8.	39284	39383		99.74	99.28	20802	21443		100.78	99.71
9.	39099	38277		99.53	97.19	21065	21264		101.26	99.17
10.	39247	37545		100.38	98.09	21421	21029		101.69	98.89
11.	39432	36970		100.47	98.47	21575	19686		100.72	93.61
12.	39653	37336		100.56	100.99	21667	20817		100.43	105.75

Both the unemployment rate and the number of registered employees in the country, or any other observed coefficient can be compared with the previous relatively stable, without force majeure 2019 data: we see that, regardless of the consequences left by Covid-19 and the 44-day Artsakh war, the indexes have a positive tendency. We also have changes in the average nominal wage in the labor market during the period under review, but they are mainly growing, which is especially evident in 2021. Positive wage growth in 2020 is also evident, but at a slower pace than in 2021 (see Figure 3). Despite the fact that it is noticeable a tendency of increasing nominal wages in Armenia, at the same time, there is inflation, as a result of which rising nominal wages do not really leave much of an impact.

[1] The table was compiled by the authors based on the data of the Statistical Committee of the RA.

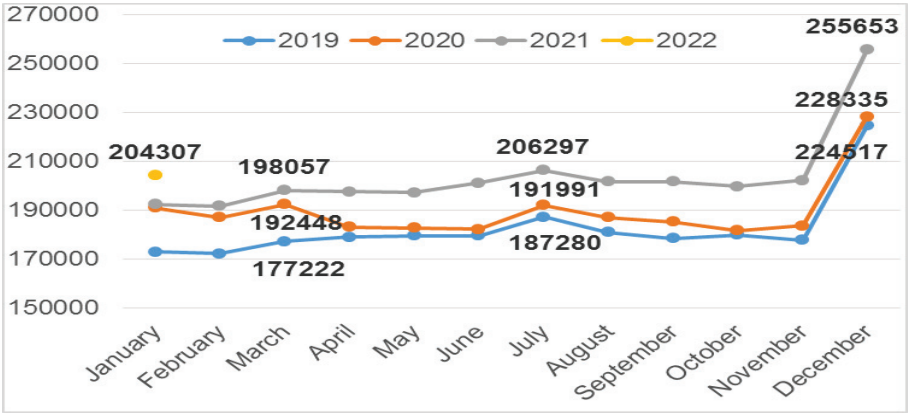

Figure 3. Dynamics of average nominal salary in the RA labor market, 2019-2022[1]

Through the efforts of the Armenian job search website Staff.am and "Modex" company, "The Labor Market 2021 report" was published in 2021, and the main focus of which is to study the changes in the Armenian labor market under the influence of pandemic and the 44-day war. Of the conclusions highlighted in the report, it is worth mentioning that the labor market activity has doubled compared to 2020. As a result of the devastating effects of the war, the possible increase in emigration, as well as the wide spread of long-distance work because of the pandemic, there is a significant shortage of labor in Armenia today. This refers to both highly qualified professionals and the craft sector, the labor force, the strong demand for which is also obvious. It can be assumed that although many have left the country or switched to working remotely for companies from other countries, the recruitment of new employees has been quite fast and flexible, which has ensured the absence of strong negative trends in the coefficients studied above. All this is evidenced by the dynamics of the sharp increase in vacancies on the staff.am platform presented in the report. Thus, in 2021, about 17,720 vacancies were announced on the platform, which was 10088 in 2020, and only in November 2021, 1729 vacancies were announced on the website, and in January, only 985.

From the very beginning of the outbreak of Covid-19 in Armenia, it was made many decisions to neutralize the economic and social consequences of the coronavirus. A number of social impact mitigation measures have been targeted at families or individuals who have lost their jobs within a pre-determined period of time. Thus, in Table 4 we see the volume of expenditures made and planned within the framework of these programs, the number of beneficiaries and planned users in 2020.

[1] The table was compiled by the authors based on the data of the Statistical Committee of the RA.

Table 4. Total costs of reducing the social consequences of the Covid-19 pandemic[1]

	Amount of funds spent / AMD	Financial performance	Number of beneficiaries / person	Planned number of users/ person
4th measure	182 M	95.60%	1820	1904
6th measure	505 M	97.40%	7420	7974
7th measure	933.6 M	99.80%	9299	9350
8th measure	9 B	97%	134679	136837
9th measure	4.7 B	89.80%	195419	199599
20th measure	3.1 B	98.80%	44895	45408
22th measure	342 M	89%	5040	5647

It is obvious that the number of beneficiaries of these measures to neutralize social problems is quite large, for many of which there is a condition for qualifying, as it was mentioned, losing a job in a predetermined period. Thus, within the framework of the 6th measure, the beneficiaries are those individuals who had a registered job from January 1 to March 13, 2020 but were fired from March 13-30. The number of beneficiaries of the event was about 7420, but combining it with the number of employees from Table 1, we see that the decrease in the total number of employees in March is not really observed compared to the previous period. The beneficiaries of the 4th measure are families with children up to 14 years old, where parents or one of the parents lost their registered job between March 13-25, and as of March 25, neither parent has a job. Again the program targeted those who lost their jobs in March., a sharp change in the number of employees is visible in April 2020, so the total cost of the measures would be completely different if they were provided to those who lost their jobs in April.

Conclusion. The labor market in Armenia has had some issues with the spread of the pandemic, especially in 2020, but from a macroeconomic point of view, there is no decrease in indicators, on the contrary, there is an increase in the latter. Due to the high rate of emigration and the opportunity to work remotely in foreign companies, the demand for labor in the country has increased considerably, which is being met at a fairly rapid pace, preventing large gaps in the market. Thus, we can state that, unlike other labor markets in other parts of the world, the large and long-standing external crises did not appear in Armenia and the problems that arose were of a very short nature

[1] The table was compiled by the author based on the data of the state budget execution reports.

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RA labor market changes in the context of the Covid-19 pandemic

Key words: Covid-19, labor market, unemployment, quarantine restrictions, measures to neutralize the effects of the pandemic

The COVID-19 pandemic has disrupted the whole world, causing many social and economic issues. In particular, at the initial stage of the pandemic, the above-mentioned issues were more acute; urgent measures had to be developed and implemented at the state level. In order to restrain the rate of the pandemic, the government adopted a number of economic and transport laws and decisions imposing other restrictions. In consequence of that, sharp fluctuations were observed in the RA labor market. Especially during the early stages of the pandemic, many employees lost their jobs or started working fewer hours. Labor market indicators have started to show some irregular changes. Hence, the arising issues led to accepting several coronavirus mitigation measures in order to reduce the result of coronavirus, especially a large group of events was directed to reduce the social impact of problems in the labor market, especially for those who have lost their jobs. This study has examined the dynamics of changes in the leading indicators characterizing the RA labor market, their relationship with the outbreak waves, and the nature of measures to neutralize the effects of the pandemic since 2019.

ORGANISATION, MANAGEMENT, ECONOMIC CONSEQUENCES, AND LEGAL QUALIFICATION OF THE MASSACRES OF ARMENIANS IN 1988 IN KIROVABAD (GANDZAK)

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Key words: Kirovabad, Gandzak, pogrom, mass massacres, genocide, economic losses, crime against humanity, ethnic cleansing, Armenophobia.

Introduction. Within the context of the Armenian mass massacres in the cities of Sumgait and Baku, the pogroms in the city of Kirovabad (Gandzak city of the historical Utik province of Greater Armenia, now called Ganja city of the Republic of Azerbaijan), the third largest city in the Azerbaijani SSR in population and the second largest in territory, the comprehensive study and coverage of the events of November-December of 1988 (also known as the "Kirovabad mass massacres" or "Kirovabad Pogroms") have often been overshadowed.

Methodology and literature review. In order to form a complete understanding of the mass massacres of Armenians in Kirovabad, of particular importance are G. Oganesov's and H. Kharatyan's co-authored book called "*Self-defence of Armenians in Kirovabad from 1988 to 1989 according to the eyewitnesses*", as well as L. Melik-Shahnazaryan's book "*Gandzak: Neutrachenniy mir*", interviews of the representatives of the USSR Prosecutor's OFfice, as well as local and Western press publications.

This article is written based on a comprehensive examination of facts, applying the principles of historical analysis. At the same time, the methods of legal analysis were used to qualify the crimes committed against the Armenian population of Kirovabad.

Scientific novelty. Our study revealed the impact and the response of healthcare system: during the days of the mass massacres, Armenian patients were expelled from Kirovabad hospitals, Armenian women were not admitted to maternity hospitals, and the ambulance refused to approach the Armenian part of the city. law enforcement bodies were warned to disable. Public services were disrupted: gas, electricity and water supplies have been cut off in Armenian apartments since November 23. Special management was inforced**: a**mong the instigators were not only the organisers of the district level, but also the heads of the city's workshops, professors of higher educational institutions, representatives of the management staff.

Analysis. *Signs of the mass massacres.* On the eve of the mass massacres of the Armenian population in Kirovabad, the total population of the city was about 280 thousand, of which 40-45 thousand were Armenians [Melik-Shahnazarjan 1996, 13]

[Oganezov and Xar'atyan 2014, 93]. Taking into account the fact that the city had a separate Armenian part, about 32 thousand Armenians were concentrated in that area of the city. The situation in the city of Kirovabad was aggravated due to hostile feelings towards the Armenian population at the end of February in 1988, since the Sumgait mass massacres. The pogroms were prevented only as a result of the resistance of the engineering workers and the servicemen [Oganezov and Xar'atyan 2014, 95]. On November 17 of the same year, crowded demonstrations began in Baku against the Soviet authorities in Azerbaijan. The key issue among the raised ones was the weakening of Azerbaijani control over Nagorno-Karabakh Autonomous Region. In particular, the issue of construction of an aluminium warehouse in the forest area called "Khachin Tap" (Azerbaijani: "Topkhana") in the Nagorno-Karabakh Autonomous Region was actively discussed [Melik-Shahnazarjan 1996, 16]. The situation was especially aggravated by the fact that the head office of the workshop was located in Armenia [Saroyan 1997, 185]. Despite the explanations about the absence of environmental risks, the active discussions of the issue did not stop, creating the impression of contemporaries sowing national hatred against Armenians [Melik-Shahnazarjan 1996, 16].

In the mentioned conditions, the fact of one of the defendants, Ahmed Ahmedov, being sentenced to death by the USSR Supreme Court for the mass massacres of Armenians in Sumgait in February 27-29, 1988, was perceived especially sensitively by the Azerbaijanis. The verdict was published on November 18, 1988. Demonstrations broke out in Baku, Kirovabad, Nakhichevan, Shaki, Zakatala, Shamkhor, Ali Bayrami, Kadaba, Mingechaur and Gutgashen [Saroyan 1997, 185] [Kaufman 2001, 77].

On November 21, 1988, students and employees of manufacturing enterprises gathered in groups in front of the Communist Party's city committee building in Kirovabad Square. The slogans of the demonstrations had already turned into calls for the physical destruction of Armenians: "Death to Armenians!" and "Armenians, leave!" [Oganezov and Xar'atyan 2014, 6]. As in the case of the mass massacres of Armenians in Sumgait, in Kirovabad as well identical iron rods and stones appeared mainly in the hands of young "demonstrators" [Oganezov and Xar'atyan 2014, 6]. The November 21 demonstrations were also notable for the fact that they were attended by members of the party's city committee bureau and other officials [Xar'atyan 2015, 87]. It should be noted that according to eyewitnesses, during the Kirovabad mass massacres, many criminals had the lists of Armenians with the addresses were noticed [Oganezov, Xar'atyan 2014, 138].

Process and management. On November 21, 1988 at 3 pm, the armed participants of the crowded demonstration against the Armenians, accompanied by the police, moved to the Armenian part of Kirovabad, beating the Armenians they met on the way. Reaching the Armenian St. Gregory the Illuminator Church, the crowd carried out a pogrom. In the evening of the same day, the Armenian part of Kirovabad was blocked by Soviet soldiers [Oganezov and Xar'atyan 2014, 187]. The first murder took place on the same

day. Rosa Melkumyan was killed in her house. Despite the fact that the murder was committed in the presence of many witnesses, a heart attack was mentioned as the cause of death [Xar'atyan 2015, 88]. On the same day, a group of Armenians gathered in the Armenian church of the city formed the "Initiative Group", which had to undertake some functions of self-defence and self-organisation of the Armenian population during the Kirovabad mass massacres. In particular, the Initiative Group organised the arrest and handover of the perpetrators to the servicemen, the provision of first aid to the victims of violence as well as to those evacuated from hospitals, and the provision of food and clothing to the Armenians who fled the Azerbaijani part of the city.

It should also be noted that the soldiers who arrived in the city were actually unarmed, and many did not even know where they were currently located [Melik-Shahnazarjan 1996, 26]. The arrival of the military forces was immediately followed by the attacks of the Azerbaijanis on them. Despite the aforementioned, during the first days of the mass massacres, the servicemen did not have weapon permits [Talashkevich, 1991]. According to the statement of city guard P.P. Polyakh about ten thousand people took part in the "demonstrations" [Oganezov, Xar'atyan 2014, 164]. Even with the deployment of troops, there were regular attempts to attack the Armenian part. On November 22, at 17:00, a state of emergency was declared in the city - a curfew was imposed. Some authors note that the curfew was imposed only on November 23 [Rost 1990, 82].

The mass massacres of Armenians in Kirovabad continued according to the above presented scenario up until November 26, 1988, and the local demonstrations continued until the Armenians completely left the city.

It is now important to discuss some institutional and social-economic key circumstances related to the mass massacres of Armenians in Kirovabad.

1) The response of the healthcare system: during the days of the mass massacres of Armenians, Armenian patients were expelled from Kirovabad hospitals, Armenian women were not admitted to maternity hospitals, and the ambulance refused to approach the Armenian part of the city [Oganezov, Xar'atyan 2014, 7].

2) Inaction (participation) of law enforcement bodies: in addition to what has already been presented, it should be noted that the perpetrators captured by the Initiative group at the time of the committed crimes and handed over to the military often reappeared in criminal groups shortly afterwards, continuing violence against Armenians [Xar'atyan 2015, 91-92, 94] [Melik-Shahnazarjan 1996, 36]. The local authorities announced their inability to protect the Armenians, urging them to leave [Oganezov and Xar'atyan 2014, 101].

3) Disruption of public services: gas, electricity and water supplies have been cut off in Armenian apartments since November 23 [Xar'atyan 2015, 91] [Oganezov and Xar'atyan 2014, 125].

4) The instigators: there is information about the active work of the instigators during the Kirovabad massacres. Among the instigators were not only the organisers of the district level, but also the heads of the city's workshops, professors of higher educational institutions, representatives of the management staff [Oganezov, Xar'atyan 2014, 112].

Consequences and condemnation. According to the head of the investigation group A. Kondratov, in 1988 in Kirovabad within November 21-26, 1,628 crime reports were received, of which 1,141 were about the destruction of apartments and houses. To illustrate the scale of the attacks, it would be sufficient to say that 34 pieces of armoured vehicles were destroyed during the street battles [Talashkevich, 1991].

The main target of Azerbaijan's aggression was the peaceful Armenian population. In those years, 1/6 of the population of Gandzak / Kirovabad / were Armenians. According to various estimates, they received more than 1/5 of the total income. Armenians played great role in Gandzak's / Kirovabad / society and economic life. They were successful businessman, cultural figure and institutionally integrated in social and political life of the country. For the organizers, it was a good bait for the mass riots and massacres, which they carried out with savage eggs against the civilian population.

Institutionally and economically, the process of redistribution of resources took place in a brutal, brutal, medieval way. Institutionally, the lack of legal assessments of these phenomena will lead to such situations in the world on a regular basis. Some groups have interpreted this as a clash of civilizations, giving it a religious connotation, but in fact an economic motive in the clash of interests exists. In those actions there was a desire to get richer in easy and fast way. Later, it became a cause of unrest and a rough redistribution of capital. (Like the pre-initial accumulation of capital in the Middle Ages, the redistribution of capital in Azerbaijan took place according bloody laws under the under a silent outlook of the civilized world). People with a certain thinking, representtatives of the nation, consider the above way to be an acceptable, justified way to get rich quick. According to the data recorded by the initiative group, as of November 27, 10 people were killed, 3 of whom were servicemen, 5 women, girls were raped, 55 were injured and severely beaten [Oganezov, Xar'atyan 2014, 191]. As of November 30, the number of people who were seriously injured reached 63, and 250 people received first aid. The number of missing persons has reached 55, some of which were found later. In April 1989, the circumstances of the murder of 12 disabled people from the Kirovabad Kyapaz Disabled House and their burial in the Kura River floodplain were confirmed. During the days of the mass massacres, more than 70 investigators arrived in Kirovabad [Oganezov, Xar'atyan 2014, 161, 234, 344, 459-461], whose work results are not available in public sources. Kondratov noted that during the preliminary investigation it was possible to find out only the local organisers, but the work of revealing the main organisers did not lead to positive results [Talashkevich, 1991]. Armenians fleeing from Kirovabad were forced to sign declarations to leave the city on a voluntary basis and

lack of property claims [Xar'atyan 2015, 94]. On December 14, during the last meeting organised by the Initiative Group, commandant V.S. Omelchenko announced the following: "Obviously, these crimes did not occur just now, but were preceded by a long ideological preparation, that is why such issues are not solved right away: some time is required" [Oganezov and Xar'atyan 2014, 321].

Conclusion. The study shows that the mass massacres of Armenians in Kirovabad could not be organised on a larger scale due to the following circumstances. 1) the existence of a densely populated Armenian part of the city, 2) the fact that the Armenian-Azerbaijani parts of the city are separated by a river; 3) the self-defence organised by the Armenians. Like the pre-initial accumulation of capital in the Middle Ages, the redistribution of capital in Azerbaijan took place according bloody laws under the under a silent outlook of the civilized world. The presented factual circumstances are sufficient to claim that in 1988 in Kirovabad city of Azerbaijan, in other settlements, acts condemned by international criminal law took place. In particular, the United Nations (UN) 1948 Article 2 of the Convention on the Prevention and Punishment of the Crime of Genocide [UN General Assembly 1948] defines the crime of genocide. 1946 UN Gene-ral Assembly Resolution 96 (1) states that *genocide is a denial of the right of existence of entire human groups, as homicide is the denial of the right to live of individual human beings* [UN General Assembly 1946]. For instance, the International Criminal Tribunal for Rwanda has concluded that genocide is impossible without a plan [ICTR 1999, para.94; ICTY 1999, para. 101].

According to the elements of a crime accepted by the International Criminal Court, "living conditions" include, but are not limited to, the deliberate deprivation of irreplaceable resources for survival, such as food or medical care, or the systematic eviction of persons from their homes [ICTR 1998, para. 502; ICTR 1999, para. 109]. From the above presented legal analysis and comparison of historical data can be concluded that the crimes committed in the city of Kirovabad of the Azerbaijani SSR correspond to the elements of the crime of genocide. Nevertheless, it should be noted that courts and tribunals often exercise caution when designating acts as genocide, using the term only in exceptional cases. In the aforementioned context, it is necessary to also consider the crime against humanity. Article 7 of the International Criminal Court of the Rome Statute [UN General Assembly 1998], adopted in 1988, stipulates that the "crimes against humanity" must be committed *as part of a widespread or systematic attack directed against any civilian population.*

An analysis of the characteristics of the objective aspects of crimes against humanity, the comparison of the presented evidence of the events against the Armenians of Kirovabad, demonstrates that even if the cited facts do not prove "beyond a reasonable doubt" the existence of genocidal intent, the mass massacres fall at least under the category of crimes against humanity.

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Organisation, management, economic consequences, and legal qualification of the massacres of Armenians in 1988 in Kirovabad (Gandzak)

Key words. Kirovabad, Gandzak, pogrom, massacres, genocide, economic losses, crimes against humanity, ethnic cleansing, Armenophobia.

Anti-Armenian pogroms in the city of Kirovabad (Gandzak) of the Azerbaijan SSR in November-December 1988 were organized. This is proved by the reaction (lack of it) of the healthcare system to the massacres, the inaction of law enforcement agencies, and sometimes their active participation in the crimes, disruption of public services in the Armenian part of the city, and the presence of instigators in the city. Historical data on the Kirovabad massacres are sufficient to claim that crimes defined by the international criminal law took place in Kirovabad and other settlements of Azerbaijan in 1988. The crimes committed against the Armenians in Kirovabad correspond to the elements of the crime of genocide, as well as the crimes against humanity both with their objective and subjective aspects.

INTRODUCTION OF SOCIAL ENTREPRENEURSHIP IN AGRIBUSINESS IN THE REPUBLICS OF ARMENIA AND ARTSAKH

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Key words: Social Entrepreneurship, Entrepreneurial Skills, Corporate Governance, Risk Management, SWOT Analysis, Social Impact

Introduction. At the current stage of economic development, social entrepreneurship is a type of entrepreneurial activity, the main goal of which is to solve specific social problems in addition to making a profit. More than 50 + n% of the profit from the social enterprise in the world practice is directed to the solution of social problems [Seferyan, 2010, 15]. Both in the international practice and in the Republics of Armenia and Artsakh, the introduction of Social Entrepreneurship in agribusiness will create the necessary opportunities for poverty reduction, community activation, acquisition of new knowledge, skills and balanced development among the rural population. In the Republics of Armenia and Artsakh, Social Entrepreneurship is in the development stage, so bilateral cooperation between the state system and the private sector is of key importance for the development of this sector.

Methodology. Scientific research and analysis on the issues of Social Entrepreneurship served as a scientific basis for the research. Systematic approach and comparative analysis and comparison methods were used during the research.

Review of literature. The application of social enterprises in agribusiness is based on the fact that agriculture in the Republics of Armenia and Artsakh are in constant need of investment, and from a business point of view, there are still many open segments in the field of agriculture.

The development and application of social entrepreneurship in agribusiness can create new investment directions for the economies of the Republics of Armenia and Artsakh, which in turn will contribute to the implementation of new business ideas, management, new culture, and many untapped opportunities. Studying the peculiarities of the Armenian market, the problems of social entrepreneurship have been singled out.

The following factors are emphasized as key issues of social entrepreneurship:

- There is no clear policy in the field of social entrepreneurship, there is no common definition, appropriate criteria according to which companies can be classified as social enterprise.

- There is a low level of awareness in the sector, which is due to the fact that social entrepreneurship in the economies of Armenia and Artsakh has not yet received adequate attention from either the state or the private sector.
- Both formal and informal educational institutions do not address social entrepreneurship, while it is considered an integral part of modern international business culture.

Scientific novelty. In order to respond quickly to foreign investments in agriculture through social entrepreneurship in the Republics of Armenia and Artsakh, we propose to offer potential investors services that will provide the potential investor with the necessary legal, market research, marketing, management, tax, accounting and information consulting. we suggest that commercial banks can be more effective in these organizations, as potential investors do not trust unfamiliar ordinary business consulting companies. In Agribusiness, Social Entrepreneurship is targeted to make large investments, as this way it is possible to achieve significant results, but with this approach it is possible to create an opportunity for SMEs with certain services to serve large social enterprises. This will create new markets for SMEs in agriculture. The effectiveness of social enterprises depends not only on the amount of profit, but also on the degree and level of social impact. In order to assess the level of social impact, it is necessary to prepare relevant reports, which should present in detail what specific problems have been solved by the given social enterprise, what statistical and qualitative results have been recorded.

Analysis. Agriculture, being a dominant branch of the economy in the economies of the Republics of Armenia and Artsakh, still has many untapped opportunities, some of which can be realized through social entrepreneurship.

In order to increase the investment attractiveness of agriculture, it is important to switch from traditional agriculture to industrial agriculture. Traditional agriculture is not attractive for investment due to its instability, while innovative knowledge-based agriculture allows minimizing agricultural risks by increasing the efficient use of invested resources" [Praszkier, Nowak, 2018, 25].

The securities market can play a key role in attracting investment in agribusiness for social entrepreneurship, as commercial banks prefer to lend to sectors already established in the market.

Taking into account the importance of the securities market in such a case, it is necessary to identify the nuances that hinder the financing of large projects through equity participation in the Armenian market. They are mainly due to the lack of a "culture on corporate governance" [Ellis, 2010, 47]. Corporate governance has for many years played its role in the management of international business as a successful management model. Corporate governance implies a set of rules and processes to manage a

company, using certain positive constraints on the company regarding the behavior of shareholders and beneficiaries. Corporate governance requires the company to take care of its shareholders, to show a responsible attitude towards the individuals and companies with which it cooperates. The governance system should be such that everyone understands the scope of their rights and responsibilities. Corporate governance requires that once a company has adopted specific policies, it must implement them in its operations.

In order to assess the potential of the social entrepreneurship sector in Armenia and Artsakh, it is necessary to conduct a SWOT analysis, which will enable to identify the advantages and disadvantages of the social entrepreneurship, as well as the actual opportunities and threats"[Martin Clark, 2018, 27].

1. The following factors are considered as advantages:

- The great interest of young people in the social entrepreneurship, which implies potential opportunities to bring the field of social entrepreneurship to a new level.
- Practical interest in overcoming poverty is already a potential motivation for engaging in the social entrepreneurship and these motives are further enhanced by the study of foreign practice, where social entrepreneurship (SE) plays an important role in the financial recovery of communities and in overcoming poverty.
- An intensive work style is adopted in Armenian management in order to achieve the desired result, which is a key role in SE, as compared to traditional businesses, SE is not limited to making a profit.
- The development and price availability of companies providing outsourcing services to businesses creates additional opportunities for the SE to carry out business activities effectively, making targeted use of available financial, technological and human resources.

2. The following factors are included under the disadvantages:

- Having a small market that many investors are not interested in, but it is easier to gain recognition among potential customers in a small market and the national market does not suffer from franchising and network companies.
- The atmosphere of distrust towards SE, the overcoming of which is a matter of time, as well as it is purposeful to overcome the unjustified distrust towards SE by fully speaking out and presenting successful projects.
- Absence of the organizational and legal status of the SE, in the presence of which a great activation is expected towards the SE.
- Implementation of tax administration, which is still in the development stage, and, it is advisable to have a "Tax Mediator Institute" in case of legislative disagreements in order to provide an effective solution to disputes with minimal costs in a short period of time.

Due to the fact that social enterprises are quite sensitive to the external environment, so very often, in addition to SWOT analysis, they also perform PEST analysis to determine the impact of the external environment on social enterprises.

There are different approaches to assessing the external environment, but in social entrepreneurship PEST analysis is more targeted. PEST analysis is designed to identify the political / legal, economic, social and technological factors of the external environment that affect the organization's activities.

The inclusion of legal factors under political factors is conditioned by the fact that the state pursues its policy based on the relevant legal levers.

The success of social entrepreneurship largely depends not only on environmental factors, but also on the level of training of managers. The international practice of SE has proven that there are certain nuances that are key to succeeding in the competition in the market.

In order to be successful in the market, the company must have a specific vision. There are two approaches to achieving the desired vision in business practice, planned and situational.

- The planned approach involves being guided by a pre-designed strategy, for example, according to a business plan, the Canvas model, strategic planning, and other forms.
- SE is more sensitive to any changes, and this requires a special risk management approach [ACBA, 2021]. Of the many methods of risk management, the most successful is the following approach, which is implemented in three stages.
- In the first stage, all possible risks are identified and classified according to the degree of danger.
- In the second stage, the identified risk management methods are selected and a risk management policy is developed.
- In the third stage, a risk control system is introduced - selection of monitoring methods.

In order to implement risk management effectively, statistical, expert and scenario methods can also be applied in risk management policy.

- The essence of the statistical method is to provide factual arithmetic data at a particular point in time.
- The expert method is the risks considered by the relevant specialists, as well as the level of their impact in this or that project.
- The scenario method is designed to find out the company's actions in various possible adverse situations.

Conclusion.Taking into account the great potential for the development of agriculture and social entrepreneurship in Armenia and Artsakh, the question arises: What are the problems of investing in agriculture through social entrepreneurship, when there is a great potential of the Armenian Diaspora in terms of attracting investments? Therefore, in order to solve the problem, it is first necessary to have mechanisms to respond quickly to foreign investment.

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Introduction of social entrepreneurship in agribusiness in RA and AR

Key words: social entrepreneurship, entrepreneurial skills, corporate governance, risk management, SWOT analysis, social impact

Social entrepreneurship is a type of entrepreneurial activity, the main purpose of which is not only to make a profit, but also to solve certain social problems, more than 50% of the profits from the social enterprise is used in world practice to solve social problems. Social entrepreneurship ensures the reproduction of capital, which allows directing funds allocated for charitable purposes from one-time consumption to investments, and the solution of social problems is carried out through self-financing. The user of the product or service of the social enterprise gets the opportunity not only to satisfy his personal needs, but also to participate in the solution of certain social problems. The effectiveness of social enterprises depends not only on the amount of profit, but also on the degree of social impact. In agribusiness, social entrepreneurship is targeted to make large investments, as this way it is possible to achieve significant results, but with this approach it is possible to create an opportunity for SMEs with certain services to serve large Social Enterprises. This will create new markets for SMEs in agriculture.

THE IDEA OF BRANDING IN THE CONTEXT OF CUSTOMER SATISFACTION THEORIES

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Key words: branding, marketing, customer satisfaction, dissonance, customer expectations

Introduction. Consumer satisfaction analysis is an important part of marketing theory. There are a lot of theories, the aims of which are to model consumers' satisfaction from products and services and to identify factors that influence it. The theories of dissonance and contrast, as well as expectancy disconfirmation paradigm of consumer satisfaction are considered in this article. But despite numerous studies, branding has never been considered as a significant and a separate factor in the framework of consumer satisfaction analysis. The aim of this research is the attempt to include it as a separate factor under the theories mentioned above.

Scientific Novelty. The scientific novelty of the article is within its approach to include the factor of branding into the customer satisfaction theories discussed. It is considered as a separate exogenous or indigenous factor in the models discussed.

Methodology. Mathematical representations of the models of customer satisfaction reviewed are given in the article. The factor of branding is included into the models as an internal or external variable. In both cases variables of branding are fitted into mathematical models to account for the effects of branding assumed.

Literature review. The dissonance theory of consumer satisfaction is based on Leon Festinger's theory of cognitive dissonance [Leon Festinger, 1957], according to which in almost all situations individuals seek internal psychological harmony between their different perceptions: thoughts, beliefs, values, worldview, attitude, etc. In almost all real-life situations individuals want to see a correspondence between the present situation, conditions, and events and their own thoughts, beliefs, behaviors. In situations of cognitive dissonance, when conflicts or inconsistencies arise between different perceptions of a person, individuals tend to eliminate that inconsistency by changing one of inconsistent perceptions [Harmon-Jones, Mills, 2019]. According to Festinger, cognitive dissonance is a situation that motivates people to change their perceptions, striving for consistency. Based on Festinger's theory of cognitive dissonance, the dissonance theory of consumer satisfaction was developed [Cardozo, 1965], according to which a consumer who had high expectations about the product or service, but actually received a low-value product or service, will have a cognitive dissonance as a result of inconsistency between real experience and expectation and will be motivated to change his/her own

perception of real experiences [Park, Cho, Rao, 2015]. That is, if there is a discrepancy between expectations of the product and the perception of the results obtained from its use, the person will change his/her perception of the results to be consistent with expectations [Yuksel, Yuksel, 2009].

For example, the consumer goes to a concert from which he has very high expectations, but the concert is actually low quality. According to the theory of cognitive dissonance, the consumer, feeling a discrepancy between the expectations and the "real result of the concert", will match his perception of the concert with his expectations, claiming that the concert was not so bad and it was quite good. In addition to the expectations from goods and services, an important factor in dissonance theory is considered to be the effort spent to obtain it (money, time, the importance of product or service for the person, etc.).

The theory of dissonance is usually opposed to the contrast theory of consumer satisfaction. According to contrast theory, in the case of discrepancy between expectations and the perceptions dissonance does not occur, and consumers are not motivated to adjust their perceptions to match expectations, but on the contrary, consumers tend to increase that discrepancy [Oliver, 1997].

But the most widely accepted theory of consumer satisfaction in the marketing literature is the expectancy disconfirmation paradigm (Oliver 1977, 1980). This model assumes, that the consumers make their purchases with certain expectations from the product. If the product or service meets their expectations, then confirmation occurs. If the product does not meet their expectations disconfirmation occurs. Disconfirmation can be positive, when the product or service exceeds consumer's prepurchase expectations, and negative, when the product or service is worse than expected. When positive disconfirmation occurs, consumers are satisfied with the product or service [Oliver, 1997] [Oliver, 1980], and when negative disconfirmation occurs, they are dissatisfied [Wei-Tsong Wang, Wen-Hung Chang, 2014].

Analysis. Two groups of consumers are considered to present the theory of dissonance. The first group has low expectations from the product, and second group has high expectations. The real level of the product is in the middle of high and low expectations.

If $E_L(X)$ *- low-expectation consumers' expectations from the product*

$E_H(X)$ *- high-expectation consumers' expectations from the product*

X *- the real level of the product, then*

$E_L(X) < X < E_H(X)$

The first group of consumers, who has low expectations, get a product that exceeds their expectations. The second group of consumers, on the contrary, get a product

that is worse than they expected. Each of these groups of consumers are also divided into two subgroups: consumers who have made little effort to obtain the product and consumers who have made much effort to obtain the product.

In general, 4 groups of consumers are considered:

- high expectation and high effort consumers
- low expectation and high effort consumers
- high expectation and low effort consumers
- low expectation and low effort consumers

X_L - *evaluations of low-expectation consumers after using the product*

X_H - *evaluations of high-expectation consumers after using the product*

$EF_L()$ - *low-effort consumers*

$EF_H()$ - *high-effort consumers*

4 hypotheses are proposed according to the theory of dissonance.

According to the first hypothesis, consumers, who had low expectations and received a higher quality product or service, will evaluate it more than consumers who expected a higher quality product than they actually received. Although the dissonance theory suggests that consumers are motivated to match their expectations with satisfaction, they are not as satisfied with the product as consumers with lower expectations who received higher than expected product.

$$EF_L(X_L) > EF_L(X_H)$$

$$EF_H(X_L) > EF_H(X_H)$$

The second hypothesis includes the idea of dissonance. According to the theory of dissonance, high-effort consumers are much more motivated to adjust their perception towards expectations than low-effort consumers, therefore they will evaluate the product more trying to meet their expectations than low-effort consumers. Consequently, the differences between product evaluations of low-effort low-expectation and low-effort high-expectation consumers should be higher than between high-effort low-expectation and high-effort high expectation consumers, as a dissonance does not occur or has a weak effect in case of the latter.

$$EF_L(X_L) - EF_L(X_H) > EF_H(X_L) - EF_H(X_H)$$

According to the third hypothesis, the evaluations of low-effort low-expectation consumers will be lower than evaluations of high-effort consumers with low expectations.

$$EF_L(X_L) < EF_H(X_L)$$

And finally, the evaluations of low-effort high-expectation consumers will be lower than evaluations of high-effort high-expectation consumers, because in high effort

situations dissonance occurs having significant effects and motivating consumers to give higher evaluations of the product.

$$EF_L(X_H) < EF_H(X_H)$$

As a result, the dissonance theory takes into account two factors in modeling the process of consumer satisfaction: expectation and effort. Only few studies are dedicated into the discussion of the branding effects in contexts of consumer satisfaction theories [Cai, Geng-Qing Chi, 2021]. In the framework of this article, an attempt is made to include one more factor: the brand of the product, which is believed to cause a dissonance and have an impact on expectations and satisfaction. The factor of branding can be included as an external or internal variable in the theory of dissonance. Firstly, it can be included externally, as a separate factor, such as expectation and effort. It is assumed that the brand of the product can be favorable and or unfavorable for consumers, and consumers can be subdivided into two groups according to the branding factor. It is assumed that consumers have made the same effort to purchase the product and therefore effort is non-significant factor. Consumers are also divided into low-expectation and high-expectation groups. Therefore, in the situation observed, consumers are generally divided into 4 groups:

- consumers with favorable brand and low expectations,
- consumers with non-favorable brand and low expectations,
- consumers with favorable brand and high expectations,
- consumers with non-favorable brand and high expectations,

In this case:

$E_L(X)$*: low expectation consumers' expectations from the product*

$E_H(X)$*: high expectation consumers' expectations from the product*

X*: real value of the product*

$E_L(X) < X < E_H(X)$*:*

The factors of branding are represented below:

$B_F()$ *` consumers with favorable brand*

$B_U()$ *` consumers with non-favorable brand*

In this case, the 4 hypotheses proposed by the dissonance theory of consumer atisfaction will appear as the following. Because low-expectation consumers received a product that exceeded their expectations and high-expectation consumers received lower than expected product, low-expectation consumers will value the product higher than those with high expectations.

$$B_U(X_L) > B_U(X_H)$$

$$B_F(X_L) > B_F(X_H)$$

The inclusion of the factor of branding in the theory of dissonance implies, that dissonance will affect the consumers who favor the brand, and they will be motivated to

adjust their perceptions to meet expectations. Particularly, this will apply to consumers who received a product, the value of which was lower than expected.

$$B_U(X_L) - B_U(X_H) > B_F(X_L) - B_F(X_H)$$

The idea of branding will also fit into the last two hypotheses. In particular, low-expectation consumers who favor the brand will evaluate the product lower than consumers in the case of non-favorable brand. And finally high-expectation consumers with non-favorable brand will evaluate the product lower than high-expectation consumers with favorable brand who will experience dissonance and will adjust their perception of the product. In this case a positive correlation is assumed between brand favorability and expectations.

$$B_U(X_L) < B_F(X_L)$$

$$B_U(X_H) < B_F(X_H)$$

Another approach to account for the factor of branding would be to include it in the factor of effort as an internal variable. It can be assumed that consumers with favorable brand regard the purchase as more important and therefore will be making more effort, than the ones with non-favorable brand. It can be assumed that in case of favorable brand more effort will be made and a dissonance effect will be present. With this approach the factor of branding is only considered as an internal variable, which affects only the effort.

$$EF = \beta_0 + \beta_1 B + \sum_{i-2}^{n} \beta_i X_j$$

$$j - 1 \rightarrow m$$

$$\beta_1 > 0$$

In the model of effort presented above, beta coefficients will play very important role, especially when there will be contradictions between internal variables. For example, when large amount of money is spent to purchase the product, but the brand is non-favorable for the consumer, then the effect of large cost will positively affect the effort, but the branding factor will affect negatively, and the total effect on effort will be significantly dependent on beta coefficients.

If we try to include the factor of branding into the contrast theory, favorable brands would be assumed to reduce the effect of contrast, when the product did not meet expectations of the consumer, and in the presence of non-favorable brand the contrast may have even more impact. On the contrary, in the presence of favorable brand the effect of contrast would be higher, when the product exceeded expectations. And when the brand is non-favorable smaller effect of contrast will be noticed.

As mentioned above the most widely accepted theory of consumer satisfaction in marketing literature is the expectancy-disconfirmation paradigm. The mathematical representation of the model is shown bellow.

If

S - satisfaction,

X - *consumer's evaluation of the product or service,*

X_i - *consumer's expectation from the product or service*

then

$S = X - X_i$

$S = (X - X_i) > 0 \rightarrow satisfaction$

$S = (X - X_i) < 0 \rightarrow dissatiscation$

It is assumed that the branding will have an impact on expectations in the first place, and expectations for favorable brands will be more than for non-favorable brands. Positive correlation is assumed between brand favorability and expectations.

In addition the branding will also have an impact on the perception of the consumer about the product or service. Particularly, when the brand is favorable and the product was worse than expected, dissonance will occur and consumers will be motivated to adjust their expectations and to develop better perceptions regarding the product or service. Therefore, in the presence of favorable brand the probability of satisfaction will be lower than in the case of non-favorable brand.

Conclusions. The ddissonance, contrast and expectancy-disconfirmation paradigm theories of consumer satisfaction were considered in the article. An attempt was made to include the idea of branding into the theories mentioned above. The main theses proposed are the dependence of branding and expectations from the product or service, the impact of branding on the effects of dissonance or contrast, its impact on evaluations of a product or service and on the importance of the purchase for the consumer. The mathematical representations of the theories including the factor of branding are given in the article. The proposed theses can serve as a basis for further empirical analysis.

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The Idea Of Branding In The Context Of Customer Satisfaction Theories
Key words: branding, marketing, customer satisfaction, dissonance, customer expectations

An important part of marketing theory is the theory of consumer satisfaction, through which an attempt is made to model the process of consumer satisfaction as a result of consuming a product or a service, to identify the reasons and factors that affect it. Although there are many valuable and applicable theories in the marketing literature, the idea of branding as a separate factor is not considered in any of them. This paper attempts to consider the idea of branding in the context of theories of consumer satisfaction and to include it as a separate factor. Within the framework of the work the dissonance theory of consumer satisfaction, the theory of contrast, as well as the expectancy-disconfirmation paradigm are considered. The main theses proposed are the dependence of branding and expectations from the product or service, the impact of branding on the effects of dissonance or contrast, its impact on evaluations of a product or service and on the importance of the purchase for the consumer. The proposed theses can serve as a basis for further empirical analysis.

THE RELEVANCE OF INFORMATION TECHNOLOGIES IN THE DESIGN OF MECHANICAL SYSTEMS WITHIN THE FRAMEWORK OF MODERN TECHNOLOGICAL PROGRESS

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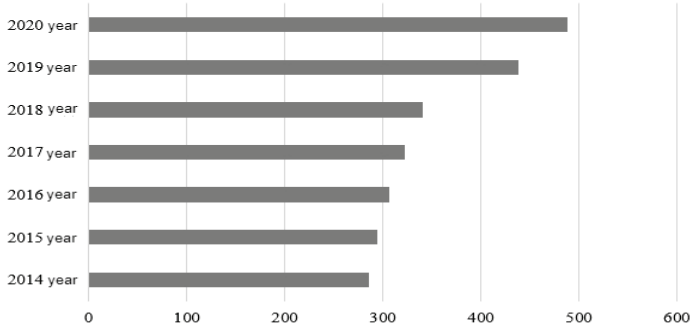
Key words: information technology, technological progress, information, economy, innovation

Introduction. Starting to study the relevance of information technology (IT) integration in order to improve the efficiency of modern manufacturing enterprises, it is necessary to define the concept and significance of IT in the modern world. Information and digital technologies include a number of production and software-technological tools that are combined into a technological chain, through which such processes are performed as: collection, storage, processing and output of information flows.

Literature review. The main goal, which is laid down during the integration of IT, is to reduce labor costs when using and processing information resources. Information systems use such means as: computer technologies; communication technologies, etc. Each of the means has the ability to be used in parallel with others. In addition, information technology provides enterprises with the most favorable conditions for its development due to the high-speed and timely exchange of information between departments, as well as high efficiency in its processing and use in general [Sarmina, Fomicheva, 2017, 21-29]. Information systems and technologies are one of the key vectors for the development of science and education in the modern world. Information and digital technologies are an integral part of human life today. It is through these technologies that today there are the most innovative developments that increase the efficiency of various enterprises and simplify the life processes in the everyday life of ordinary people. These technologies work on the basis of using a variety of means and methods for collecting, processsing, and transmitting data in order to obtain information of the required quality and the state of an object, process, or phenomenon. The main goal of information technology is to improve and automate the production processes at the enterprise, as well as the personal needs of a person [Skvorcova, Lebedeva, Sotnikova, 2018, 76-82].

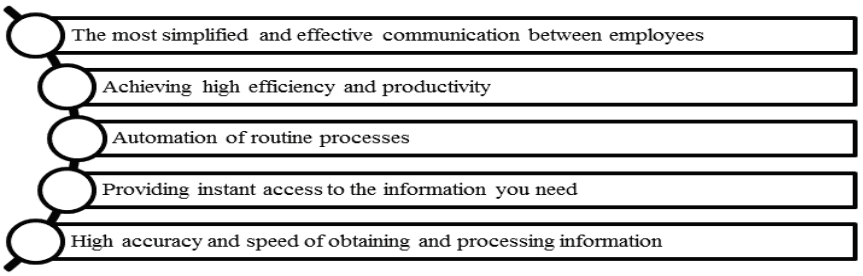
It should be noted that these technologies are the leading direction in the professsional sphere of a person. Completely new and previously unexplored technologies are being introduced and developed everywhere. At modern enterprises, there is an intensive distribution with a joint improvement of digital and information technologies. This is confirmed by the monotonically increasing turnover of the Russian IT services market. On figure 1 shows the dynamics of growth in the volume of the information technology services market in Russia in 2014-2020. As can be seen from the graph, information technologies in our country are intensively developing and are being introduced every-

where at modern enterprises, while continuously increasing the turnover of the IT services market [Seidametova, 2021, 34-42].



Picture 1. The volume of the Russian market of IT services (billion rubles)

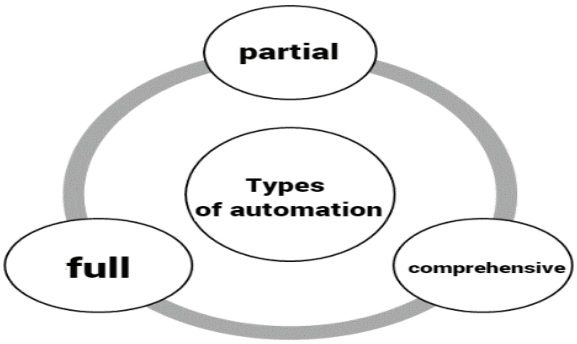
Analysis. The direction of development of the information technology market for a long time determines the main trajectories of the development of the economy and society, and has also led to tremendous changes in people's lives more than once. Mechatronic systems and technologies are widely used in modern enterprises and rationalize the work activities of people in the modern world. Over the years, IT has proven to be superior to human mechanical labor. These technologies have a number of advantages, through which the importance of their use in modern enterprises in the activities of a technologist is proved. The widespread integration of information technology in modern enterprises is a necessary factor, through which the efficiency and quality of technological processes are significantly increased. Thus, the set indicated in figure 2, the benefits of developing and integrating information technology in enterprises [Evteeva, Tatishcheva, 2015, 125].



Picture 2. Benefits of IT Integration in Enterprises

One of the most relevant areas of information technology development in the professional activity of a modern person is automation. It is automated tools that are currently the most relevant and promising in the development of scientific and technological progress. The concept of "automation" includes a broad concept, by which all processses that occur and are performed on the basis of special software are described. Due to automation, many technological tasks are performed that do not require direct human

participation. Information systems integrated at modern enterprises provide the most efficient collection, storage and processing of information required in the decision-making process from tasks in any areas. Information systems and technologies are an integral part of modern enterprises and organizations that qualitatively improve the efficiency of processes functioning within them [Bochkarev, 2018, 28-32]. Depending on technological functions and processes performed, three main types of automation are distinguished. It should also be noted that the automation of production processes is understood as the use of such equipment, which makes it possible to carry out the technological process according to a predetermined mode. In this case, a person does not use physical force, but only controls the correct operation of machines [Braclavskij, Shmatko, 2017, 23-34].



Picture 3. Types of automation

Automation of one or more unrelated operations of the production process is called partial. It is used in cases where the direct control of a complex fast process becomes practically inaccessible to a person, or when this process takes place in life-threatening conditions. Integrated automation provides automatic implementation of the production process. In this case, human functions are reduced to monitoring the progress of processses and the operation of the device. With full automation of human functions, this allows you to control the production of a fully respected car. In this case, errors that the operator can make [Kovalyk, Fomicheva, 2017, 11-17] are excluded. Along with this, it should be noted that one of the key advantages of integrated automated tools is the removal of a person from work that is potentially hazardous to health. In this case, a person can only control production [Shmatko, Kutuzova, 2016, 87-93].

Conclusions. Thus, the main purpose of this article was to study the relevance and main trends in the integration of information technology in the technological process of the modern world. As a result of the work performed, such aspects were studied as: the relevance of the development of information technologies; the relevance of information technology integration in modern enterprises; key aspects through which the relevance of the development and implementation of automation tools is confirmed; basic information regarding information, information technology and automation in general.

Scientific novelty. We have studied the problematic aspects related to the dynamics of information technology integration in the technological process of the modern world. The results of the study can be useful in further work related to the design and development of innovative IT projects that are planned to be integrated into the engineering industry. In conclusion, it should be noted that the main focus of attention in the development of technological progress should be directed specifically to the study of information technology and the integration of the digital space in modern enterprises. It is due to this that modern enterprises and organizations will be able to acquire the highest economic and labor indicators, which will be the result of intensive and successful development in the technological aspect.

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Vardan BOSTANJYAN, Zareh ISAYAN

The relevance of information technologies in the design of mechanical systems within the framework of modern technological progress

Key words: information technology, technological progress, information, economy, innovation.

One of the most relevant areas actively used in the professional sphere of life of a modern person is information technology. Mechanical engineering technologists are expected to apply current technologies and principles from machine and product design, production and material and manufacturing processes.Mechanical Engineering is one of the broadest and one of the most popular fields of engineering.The main goals of the Information Technologies in Mechanical Engineering group is to contribute to the art of product development and to increase the permanent innovation ability of our partners, thus enabling high-valued, highly productive and dynamically acting product development. The main purpose of this article is to study the relevance and main trends of IT integration in the technological process. In the process of writing the work, the authors used theoretical, statistical and empirical research methods. The authors used scientific materials of domestic and foreign authorship.

THE MONEY SUPPLY OF THE RA, SPEED OF THE MONEY CIRCULATION AND THE "SLEEP" OF THE MONEY

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Key words: monetary policy, non-cash payments, money supply, means of payment, bank cards, speed of the money circulation, GDP.

Introduction. The purpose of this article is to consider the management of money supply in the Republic of Armenia, the increase in the volume of which, together with its volume, shows the level of income generation in the economy. Researchers have recently been actively considering the conversion of cash into non-cash, which we have considered in the context of money management in this study. This is more appropriate since the outbreak of COVID-19, as it was not just the outbreak of the pandemic that created the urgent need to move payments from cash to non-cash (reducing indirect cash flow has shown that non-cash goods, the implementation of services and work will lead to the correct management of the money supply), but also the practice of non-cash transfer from cash to be visible in international practice and research. Regardless of the type, cash or non-cash, it is included in the money supply, in which case the speed of its circulation is productive in the economy, and the transition from non-cash to cash is more controllable, manageable than income generating.

Methodology. The theoretical, informational-methodological basis for the research was the legal acts and norms in force in the Republic of Armenia, websites, domestic and foreign professional literature and articles, databases published by the Statistical Committee of the Republic of Armenia, etc. Statistical and logical, tabular, computational, comparative, systematic and other methods were used during the research. The Table 2 is based on data published by the Statistical Committee, where we are the calculation of annual GDP and money supply in 2021 was carried out using the arithmetic mean methodology.

Literature review. The object of research is GDP, money supply, the speed of money circulation calculated on the basis of these indicators in coefficient, absolute and relative quantities. V. Ordukhanyan refers to the quantitative theory of Fischer: calculating money from commodity money to cash as a means of circulation, savings, accumulation as a value, but no reference is made to non-cash money. In addition to using cash, H. Ghushchyan also uses checking accounts and deposits. Both authors consider Fisher's equations in the quantitative theory of money, but how fast does each unit of money pass (circulate) during a year from hand to hand has not been studied in the context of non-cash money management: for more accurate reflection of gross domestic product and money supply management. Although, no matter how much the payment system is deve-

loping globally, the population is always aiming to keep a certain level of cash or a certain amount, which is out of control and is a means of securing speculative mechanisms. In the context of all this, we have considered the supply of money, the speed of money circulation, the passivity of money - the object of study - "The Sleep".

Analysis. The article considers the supply of money, the speed of money circulation. To understand the velocity of money (i.e., how many times it has been used in the economy), we divide GDP by the money supply according to Fisher's equation, which is the same as money in circulation, which also includes required reserves and surpluses, i.e. the money supply (Fischer's equation: MV = PT) [Fisher, 2004, 111]. The money supply is the total amount of money in the household, which includes cash (out of banking) demand from residents and foreign currency deposits terms. Table 1 presents GDP of the RA and money supply based on what we have calculated; the speed of money circulation in 2014 compared to 2020. Researches show that the speed of rotation in 2014 was almost 2.9 points, which decreased from year to year up to 1.8 points. This means that in 2014 one unit of money has made almost 3 revolutions in the economy, as well as in 2020. The number of revolutions has decreased up to 1.8. If we consider 2020 a force majeure year for the economy and put the measurement of equal conditions in the basis of the analysis, then we will consider also 2019, as a result of which we will also record that the number of revolutions has decreased becoming 2.1.

Table 1. GDP, money supply and circulation speed in RA in 2014-2020 (million AMD)

Year	GDP	Money supply	Rotation speed	The weight of money supply in GDP	
				Absolute	Relative
2020	6,181,664	3,362,038	1.8	2,819,626	46%
2019	6,543,322	3,085,464	2.1	3,457,858	53%
2018	6,017,035	2,775,095	2.2	3,241,940	54%
2017	5,564,493	2,566,502	2.2	2,997,991	54%
2016	5,067,294	2,180,098	2.3	2,887,196	57%
2015	5,043,633	1,855,676	2.7	3,187,957	63%
2014	4,828,626	1,674,196	2.9	3,154,430	65%

In addition to determining the number of revolutions, in Table 1 we also considered the weight of money supply in GDP. According to the data in the table, in 2014, in parallel with the growth of GDP in 2020, the money supply has increased, which shows that in 2014 the smaller amount of money was more money-making than in 2019, as it was in 2020, in which case it has made up a larger share of GDP. Thus, as a result of the analysis of the indicators in the table, we can conclude that the current money supply in the economy does not contribute to the growth of domestic goods or services, or that money depreciates within the economy. This means that those who own money in the country are going to save money, not to put it into circulation or to increase the volume

of goods or to improve the services provided. This means that year by year the money creates less gross domestic product in the country or the country has "caught" the way of savings. It is clear from the data in Table 1 that the increase in the money supply did not lead to a proportional increase in GDP over 7 years, that is, the money was less circulated or "Slept" with each passing year. "Sleeping" money is out of control, which in order to actively circulate at the state level, must either create and improve an investment climate, or create an environment conducive to the creation or introduction of non-manufactured goods or services, for instance; tax encourages new StartUps in the form of benefits or grants. Even today, we see active work being done to bring uncontrolled cash into the economy through non-cash flow, which will increase control over money, stabilize monetary policy interest rates and ultimately lead to price volatility. However, as a result, the measurable money supply will increase, which we will see in the published "money supply" statistics in the coming years, but without a gross domestic product environment or toolkit, we will see a slowdown in the money cycle or faster "Sleeping money". Why? The reason is that the rate of GDP creation will remain almost unchanged, as more GDP is created year by year, and at the same time the controllable supply of money will increase, almost the coefficient of about 2 will start to tend to 1, or more figuratively speaking, 1 unit of money will create 1 unit of probable GDP at best.

Table 2. GDP, money supply by the arithmetic mean model (million AMD, 2021)

Trimasters	GDP	Months	Money supply
1st Quarter	1,284,690	January	3,286,760.00
-//-	-//-	February	3,375,502.00
-//-	-//-	March	3,424,972.00
2nd Quarter	1,575,495	April	3,377,761.00
-//-	-//-	May	3,437,755.00
-//-	-//-	June	3,491,139.00
3rd Quarter	1,900,550	July	3,548,982.00
-//-	-//-	August	3,623,104.00
-//-	-//-	September	3,605,547.00
Average annual models			
GDP	4,760,735.20	Money supply	3,463,502.44

The continuous picture of the result and the dynamic picture of the above have already been analyzed in 2021. In order to model with the available results, we have separated 2021 from the "Statistical Indicators" of the RA Statistical Committee and published the existing data to model 2021 by mathematical-logical method: the speed of rotation. The data contains the GDP data for the first 3 trimasters for 2021, for a 9-month data on money supply. To bring the available quantities to the same unit for the annual average result, we obtained an annual model using the arithmetic mean, see Table 2. To obtain the averages in Table 2, the arithmetic mean formula was used to obtain the averages of the money supply, as a result of which we got the speed of money circulation:

$$\text{Money circulation speed} = \frac{GDP}{Money\ supply}$$

Based on the annual average output model obtained in Table 2, we have calculated the velocity of money circulation, which is likely to be 1.37, for both the relative and absolute values of money supply the GDP is 1.297.232,76 AMD and 27.25%, respectively. As a result, we see that the gross domestic product, created as a result of 1 unit of money circulation, will decrease year by year.

Scientific novelty. A novelty introduced in this research is the term of "Slept money" and "Sleeping money", which shows that the money supply in the economy tends to turn less, than GDP year by year, or the ratio decreases with the same conditions as in previous years.

Conclusion. We may conclude that the right conversion of cash into non-cash will increase the effectiveness of monetary control in the economy, which will regulate the more flexible application of monetary policy instruments, infrequent interest rate changes and more accurate reflection of gross domestic product, as well as money supply, because no matter how much the payment process develops, the population tends always to keep a certain level of cash or a certain amount, which is out of control, providing speculative mechanisms.

As a result of this research, we have stated that the money supply in the Republic of Armenia is less circulated in the economy per year, that is: it "Sleeps" or the same thing is said when people go to savings year after year. In order to break this opinion in our minds, not only should non-cash money be targeted, which will increase control over the money in the economy, transparency and control, which will lead to more flexible, almost unchanged management of monetary policy instruments, but also a new investment environment, which will encourage savings to invest in either existing businesses or start-ups, why not StartUp business ideas, which will lead to a new share of GDP growth.

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Arshak VARZHAPETYAN

The money supply of the RA, speed of the money circulation and the "Sleep" of the money

Key words: monetary policy, non-cash payments, money supply, means of payment, bank cards, speed of the money circulation, GDP

The purpose of this article is to consider the management of the money supply in the Republic of Armenia, together with its volume the increase shows the level of income generation in the economy. As a result of the research, we concluded, that one unit of the money is less circulated in the economy in terms of GDP, which means that the population "has taken" the path of savings. As a result, the money, as a key means of ensuring turnover, is out of control and unmanageable. Analyzing the results of the research, we can state that, in order to reverse the situation, not only the non-cash money should be targeted increasing control over the money in the economy and transparency of circulation, but also a new investment network should be created, which will encourage savings. The analysis explains more clearly that in the last two years the "money sleep" is being express faster. In addition to the conclusion, we put forward the "Sleep" or the "Sleeping" money, which characterizes the annual decrease in the money supply in the economy or the savings of the population.

FEATURES OF SELF-MANAGEMENT AND IMPROVEMENT OF HUMAN CAPITAL'S INDIVIDUAL COMPONENTS FOR STUDENTS WITH CHARACTER ACCENTUATION

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Key words: character accentuation, self-management system, pathology, adaptation

Introduction. The classification of character accentuation, peculiarities and patterns of its manifestation, as well as the peculiarities of self-management system manifestation o have been widely studied recently in the field of psychology.

It is very important to study and identify the types of character accentuation, the self-management and it's individual components, because the accentuation of the character can develop pathologically under certain conditions and under the influence of certain social-psychological factors. Harmonious development of personality psyche is the strong guarantee, which underlies the effectiveness of its activities, communication and behavior management. Therefore, the accounting of a personality's character accentuation and self-management system is very important both in the context of individual and personnel management issue.

Scientific novelty. A study of character accentuation and the system of self-management was done. The peculiarities of the manifestation of the self-management components underlying each type of character accentuation have been revealed.

Methodology. The methodological basis for the research was the systemic approach developed by L. Fon Bertalamfi, who introduced in psychology and applied B. G. Ananev, V. P. Kuzmin, B. F. Lomov, B. G. Ananev's formation and development of personality theory, P. K. Anokhin's structural-operational approach, the personality theories of G. Alport, H. Eysenck and R. Qettel, the approaches to character accentuation of A. Lichko and K. Leonhard, the general scientific principles of determinism and development.

Literature review. Scientific psychology has been involved in the study of character accentuation nature for many decades. During this period, numerous studies were carried out, numerous attempts to classify and coordinate character accentuation (A. Lichko, K. Leonhard, V. V. Ponomorenko, I. V. Vyboyshchik, E. A. Alekseyeva, L. P. Parshukova, P. V. Volkov, D. Yu. Raigorodsky, Yu. B. Gippenreiter and V. Yu. Romanova, A. G. Maklakov, A. A. Rean, M. B. Korkina, etc.).

Accentuation is defined as the disproportionate development of character, the extreme production of separate lines, which is conditioned high vulnerability and difficulties in the adaptation process of personality in terms of certain effects.

The concept of "self-regulation" is interdisciplinary in nature. Self-regulation is a systemic process that provides the subject with the ability to adapt flexibly and adequately to the conditions at any level of self-regulation.

There are a number of approaches to self-regulation in the literature of psychology: self-regulation as a special type of activity (L. G. Dikaya, V. K. Kalin, V. V. Semikin), self-regulation as a psychological process (O. A. Konopkin, V. V. Zeygarkin), self-regulation as an ability (M. Lotbart).

The accentuations of the character are in a certain relationship with the general self-regulation and with its individual components. The author of a number of studies in this field is V. I. Morosanova.

V. I. Morosanova [Morosanova 1997, 32-33] studied the Features of relationship of students' character accentuations and self-regulation styles. She believed that each type of character accentuation has a certain style of self-regulation, which, in turn, has its strengths and weaknesses.

Shahinyan Z. referred to the Features of self-management of adolescents with accentuated character [Shahinyan 2011, 48-49]: She notes that each type of character accentuation is based on the low expression of one or more components of self-management, except planning component.

Analysis. In conditions of mental tension, the ability to self-management is generally in the average or below average, however, it is assumed that adolescents with different accentuation of character have different numbers of individual components of self-management (contradictions analysis, prediction, purposing, planning, quality assessment criteria, decision acceptance, self-control, correction).

The aim of the research is to reveal the features of self-management and the manifestation of its individual components which are underlying the types of character accentuation. Revelation of self-management components and number of personal qualities that underlie the formation of character accentuation can help to reduce the accentuation of students' character by developing certain personal qualities and by correcting self-management and it’s individual disturbed components.

The research staff included 74 ASPU students of first and second year (30 students of the Faculty of Education Psychology and Sociology, 24 students of the Faculty of Culture, 20 students of the Faculty of Mathematics, Physics and Informatics), which are grouped by the types of character accentuation.

We diagnosed the types of character accentuation according to the Shmishek Personality Test [Rogov 1999, 236-240] and the Accentuation of Personality Properties and Neuropsychological Instability Test [Arzumanyan 2002, 133]. Self-management was diagnosed by the M.N. Peysakhov's "Ability to self-manage" Test [Stolyarenko 2006, 339-347].

As a result of our research, many interesting features have been replaced:

1. Self-management of the excited type is interfered by the low expression of components of self-control, correction and quality assessment.
2. In psycho-asthenic type in the system of self-management, components of prediction, quality assessment and decision acceptance are weakly expressed.
3. In schizoid type the efficiency of the self-management hinders the low level of decision acceptance component.
4. Effective functioning of the process of self-management of the hysteroid type is interfered by the self-control and correction components.
5. In the system of self-management of overactive type, components of prediction and planning are weakly expressed.
6. Dysthymic type of self-management process is hindered by decision acceptance, quality assessment and correction components.
7. Effectiveness of the process of self-management of the cyclothymic type is disturbed through low expression of self-control and quality assessment components.
8. The low expression of the process of contradictions analysis of self-management is typical of the emotional type.
9. Poor performance component quality assessment and decision acceptance are disrupted by the effective work of self-management in the clogged type.
10. Quality assessment and planning components are poorly expressed in a system of self-management pedantic type.
11. The planning component has a weak effect on the self-management system alarming type.
12. The full-fledged functioning of self-management system of the exalted type is violated by the low expression of quality assessment component.

Conclusion. All types of character accentuation are based on self-management difficulties that hinder the process of correcting these types.

Under conditions of emotional uncontrollability, the effectiveness of various components of self-management decreases, which leads to maladaptation in most of these types.

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Features of self-management and improvement of its individual components in the first and second year students with character accentuation
Key words: character accentuation, self-management system, pathology, adaptation

As a result of our research, many interesting features have been replaced:
1. Self-management of the excited type is interfered by the low expression of components of self-control, correction and quality assessment.
2. In psycho-asthenic type in the system of self-management, components of prediction, quality assessment and decision acceptance are weakly expressed.
3. In schizoid type the efficiency of the self-management hinders the low level of decision acceptance component.
4. Effective functioning of the process of self-management of the hysteroid type is interfered by the self-control and correction components.
5. In the system of self-management of overactive type, components of prediction and planning are weakly expressed.
6. Dysthymic type of self-management process is hindered by decision acceptance, quality assessment and correction components.
7. Effectiveness of the process of self-management of the cyclothymic type is disturbed through low expression of self-control and quality assessment components.
8. The low expression of the process of contradictions analysis of self-management is typical of the emotional type.
9. Poor performance component quality assessment and decision acceptance are disrupted by the effective work of self-management in the clogged type.
10. Quality assessment and planning components are poorly expressed in a system of self-management pedantic type.
11. The planning component has a weak effect on the self-management system alarming type.
12. The full-fledged functioning of self-management system of the exalted type is violated by the low expression of quality assessment component.

ORGANIZATION, MANAGEMENT, ECONOMIC CONSEQUENCES, AND LEGAL QUALIFICATION OF THE MASSACRES OF ARMENIANS IN JANUARY 1990 IN BAKU

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Key words: Baku, pogroms, mass massacres, genocide, economic losses, crimes against humanity, ethnic cleansing, Armenophobia

Introduction. Within 1988-1990 in Baku, the capital of the Azerbaijani SSR, mass massacres were committed against the Armenian population (also known as the "Baku Massacres" or "Baku Pogroms"). These mass massacres were manifested in regular attacks, murders as well as large-scale deportation of the Armenian civilian population. The study showcases that the massacres of Armenians in Baku were not just local hooligan manifestations, but were pre-organized and also well managed.The data on the massacres of the Armenian population were previously known to the law enforcement bodies. Moreover, the massacres were committed with the permission of the law enforcement bodies and were accompanied with criminal inaction: the massacres were carefully organised and planned.

Methodology and literature review. Without underestimating the importance of other work and observation accomplished in regards to this subject, in order to have a better understanding of the aforementioned massacres and their consequences (including material) of a particular importance are I. Mosesova and A. Hovnanyan's "Baku pogroms" book, V. Harutyunyan's collection of documents "Events in Nagorno-Karabakh, Publications", "Collection of Baku massacres with eyewitness testimony" developed within the framework of "An Ordinary Genocide" program, the report published by the Human Rights Watch called "Black January in Azerbaijan". The analysis and further conclusions made within this article are largely based on the literature and evidence presented in the above mentioned works.

The article is written based on a comprehensive examination of facts and further application of the principles of historical analysis. At the same time, the methods of legal analysis were used to legally qualify the crimes committed against the Armenian population of Baku.

Scientific novelty. Despite the fact that the statistic data is extremely limited and poor, we made an attempt to make economically unambiguous assessments and tried to accurately measure the economic consequences of these tragic events. One fact is obvious: in those years there was a redistribution of wealth and property in a brutal and

bloody way, which is not typical for civilized nations. The Armenian population of Baku was rapidly leaving their homes and shelters due to the use of brute force and the threat of death. In those years, from demographic stand point, more than 15% of the population of Baku were ethnic Armenians who participated in the development of Baku. They controlled more than 20 percent of the revenue. Some of them, at best, were able to sell and exchange the property on signi-ficantly less unfavorable terms than the market price, taking with them a small part of the wealth they had accumulated over the years.

Analysis. When using the term "Baku massacres", one often refers to events that took place prior to January 19-20, 1990 (“Black January”), in particular, large-scale attacks on the Armenian population of the city, mass killings, and deportation organised from January 13 to 19 of the same year. Despite the abovementioned, the persecution of the Armenian population in Baku, the capital of the Azerbaijani SSR, the regular attacks and repressions against them started before the mentioned period, back in February of 1988 after the massacres of Armenians in the city of Sumgait [Armenian pogroms in Azerbaijan 1988-1990].

Signs of the massacres. Following the Sumgait events, the attitude towards Armenians in Baku had changed. Armenians were often discriminated against and sometimes subjected to physical violence due to their ethnicity.

Already on November 17, 1988, the first mass demonstrations began in the capital’s Lenin Square against the policy pursued by the central authorities, which was mainly related to the situation in the Armenian-populated Nagorno-Karabakh [Noble et al. 2008, 296]. Within a few days, the most extremist slogans appeared in the list of those of the demonstrations and marches, such as "Death to the Armenians", "Let's go to Karabakh" [Centr obshhestvennyh svjazej i informacii apparata prezidenta RA 2016, 158].

The next active stage of the policy against the Armenian population of Baku was in 1989. It was in July-August, which laid the foundation for a new wave of deportation [Step'anyan 2011, 508].

The state of emergency in Baku was lifted in November 1989. [Mosesova 1992, 83], which led to the start of the next phase of extreme aggravation of the situation in the capital. In the summer of 1989 and autumn of 1988, the Azerbaijani Popular Front Party (hereinafter referred to as the "Front") was established on July 16, 1988. Its main goal was the independence of Azerbaijan from the USSR [Human Rights Watch 1991, 5]. The representatives of the Front had started interfering in the work of different institutions, forcing the leaders of the latter to dismiss the employees of Armenian origin. The representatives of the Front also later broke into the institutions to control the implementation of the further instructions [Centr obshhestvennyh svjazej i informacii apparata prezidenta RA 2016, 159]:

Already in early December, the lists of the families of Armenians, as well as Russian officers, with the relevant telephone numbers were already hanging in front of the Front headquarters [Bakinskie pogromy: kak jeto bylo]. The facts of compiling the lists of Armenians and their dependence on them in front of the Front headquarters were also confirmed by the former Front representative Alizade [de Waal 2013, 92].

On December 25,1989, in the conditions of inactivity of the police [Balayan 2000], the Armenian St. Gregory the Illuminator Cathedral of the city was intentionally burnt down, as a result of which a large number of church books, icons and all church property were destroyed [Step'anyan 2011, 509]. And this explicitly demonstrates once again the "intentions" of Baku.

In response to the social agitation, during the USSR period the Nakhichevan Autonomous Soviet Socialist Republic and Baku were closed to foreigners from January 4, 1945. Thus, the Western media was deprived of the opportunity to cover the events of January held in Baku in 1990.

Process and management. Since January 11, 1990, mass demonstrations were convened by the Front in Baku, during which the slogan "Glory to the heroes of Sumgait " already known from the demonstrations during the trials of the Sumgait massacre could be heard [Sidorchik, 2020].

On January 12, the Azerbaijani Popular Front Party established the National Defence Council to protect the republic from "Armenian invasion" [de Waal 2013, 90-91]. It is noteworthy that four of the five leaders of that council were representatives of the extremist party in the Front, of which Neymat Panakhli (Panakhov) had actually called for the expulsion of Armenians from Azerbaijan [BBC News, 2020].

Already on January 13 the number of participants in rallies in Nagorno-Karabakh against the party government reached 250 thousand. During the demonstration, groups emerged from the ranks of the demonstrators and began carring out mass killings, beatings, rapes, apartment demolitions, and other crimes against the Armenians still living in the city [Zurcher 2007, 166-167]. The periodical press of the time reported data on the number of massacres. In particular, according to the press, on January 13, 1990, after 5 pm, the number of people separated from the demonstration in Lenin Square in Baku for the massacre of Armenians was about 50 thousand [Mosesova, 1992, 35].

From that moment on, the massacres of Armenians in the capital became large-scale and clearly coordinated. The organised massacres continued and controlled at the same pace for a week, until January 19.

On January 15, when the massacres were carried out on an unprecedented scale, the presidency of the USSR Supreme Soviet decided to establish a state of emergency in

Nakhichevan on the basis of unrest on the border with Iran. For reasons incomprehensible to everyone, including for the international community, the decision did not address the events in Baku [Human Rights Watch 1991, 8].

It is clear from the observation of the available evidence that the deportation of Armenians was not the only motive for the crimes committed in Baku in January 1990. In particular, throughout the January massacres, the perpetrators tried to create obstacles for Armenians to leave the country. The armed groups of the Front had taken control of the main highways, airports and railway stations of Baku, and the main purpose of the control was to identify Armenians, to physically abuse them, sometimes even by burning them. There is a number of evidence about the above mentioned [Centr obshhestvennyh svjazej i informacii apparata prezidenta RA 2016, 104, 116] [Centr obshhestvennyh svjazej i informacii apparata prezidenta RA 2017, 113], about which also, in his January 22 speech mentioned M. Gorbachev [Balayan 2000]. The presented actions testify to the control of the massacres of Armenians.

The only realistic way for the Armenians to leave the city was to leave the port by ferry. However, in this case as well, there are historical facts that testify to the cases of throwing Armenians off the ferries in the presence of law enforcement officers, killing, beating, raping and committing other crimes thereof. [Centr obshhestvennyh svjazej i informacii apparata prezidenta RA 2017, 59-60] [HorizonArmenianTV, 2011]:

The massacres lasted until almost all the Armenians remaining in the city had to leave the territory of Azerbaijan. Only after that, by the decision of the presidency of the Supreme Soviet of the USSR on January 19, a state of emergency was declared in Baku from January 20 [Harowt'yownyan 1993, 70]. On January 19-20, the USSR troops entered the city by force, as a result of which civilians unrelated to the incidents were also killed.

It is important to briefly discuss some patterns of the massacres of Armenians in Baku, which substantiate the methods of massacre control.

1) Inaction of law enforcement bodies: there is a lot of eyewitness testimony about the active participation of the police in the massacres, as well as about the inaction of the police [Mosesova, 1992, 110, 125, 179, 188, 218], [Golovkov, 1990], [Centr obshhestvennyh svjazej i informacii apparata prezidenta RA 2016, 9-10, 60].

2) The encouragement of the massacres of Armenians by the party authorities: The role of Vezirov in the establishment of the National Defence Council has often been discussed [Step'anyan 2011,10]. Vezirov also confirmed that he was categorically against the establishment of a state of emergency in Baku [velimamed, 2015].

3) Existence of organised groups of perpetrators: V.G. Provotorov noted that the National Defence Headquarters (council), which undertook the leadership of the Front, began preparing its own "armed forces", which were divided into subdivisions consisting of 20-30 people [Provotorov 1990, 39-40].

4) The nature of the massacre: the conclusion of the "Vahan" ("Shield") NGO of independent military experts states that the internal troops were able to stop the massacres. Baku was completely incapable of protecting Armenian families from massacres [Shhit, 1991, 47].

Consequences and condemnation. There is no unified data on the number of victims of the Baku mass massacres or other consequences. Moreover, it is impossible to find out the approximate number of victims. In any case, based on the available data, some traces of the Baku mass massacres will be presented.

1) Murders: according to the USSR People's Deputy V. Chelishev "After the bloody massacres, which ended on January 15 under various circumstances, even according to official data, about one and a half hundred people were killed in Baku" [Mosesova 1992, 36]. According to other data, the number of Armenians killed in Baku exceeded 400 [Step'anyan, 2011, 514]. According to eyewitness accounts, at least 500-600 Armenians were killed in Baku. [Centr obshhestvennyh svjazej i informacii apparata prezidenta RA 2016, 4]:

2) Forced migration: According to Christoph Zürcher, by January 175,000 Armenians had already left the city after the Sumgait massacre, and 13,000 Armenians left the city in January. On January 19, when the Soviet army entered the city, the majority of Armenians had already left [Zürcher 2007, 166-167].

3) Economic (material) losses: targeted attacks on Armenian homes took place in Baku, during which property was destroyed or looted. Taking into account the fact that the mentioned apartments were often immediately inhabited by Azeris from the Armenian SSR, no proper investigation of the cases was held, it is indeed difficult to consider the statistics as being reliable. Human Rights Watch recorded 2,044 home raids and 191 robberies during the January massacre [Human Rights Watch 1991, 7]. This data is not comparable with the volumes of real estate destruction mentioned in the eyewitness testimonies. Due to the pogroms in Baku, the large Armenian population deported from the Azerbaijani SSR to the Armenian SSR was in an extremely difficult socio-economic situation, which also had a direct impact on the socio-economic situation in Armenia.

4) Institutionally forced migration and brute redistribution of capital could lead to rapid enrichment in the short-term sector of the invading party, but in the long run it would lead to a reduction in investment in the country and an outflow of resources. The property of Armenian citizens and businessmen became the subject of many riots and

fights. The distribution and redistribution of that property took the lives of dozens of people, becoming a major rift in society. On the one hand, the creation of the idea of an enemy for the nation had to play a unifying role for the nation, on the other hand, the economic component, the obsession with taking other people's property, getting rich quick, became a reason to divide the nation.

Conclusion. The presented factual data is sufficient to claim that in 1990 Acts condemned by international criminal law took place in the Azerbaijani city of Baku. In particular, the United Nations (UN) 1948 Article 2 of the Convention on the Prevention and Punishment of the Crime of Genocide [UN General Assembly 1948] defines the crime of genocide. 1946 UN General Assembly Resolution 96 (1) states that *genocide is a denial of the right of existence of entire human groups, as homicide is the denial of the right to live of individual human beings* [UN General Assembly 1946].

The crime of genocide is characterized from a subjective standpoint by a special *intention*: it must be committed with the intent to destroy, in whole or in part, a national, ethnic, racial or religious group. The International Criminal Tribunal for the Former Yugoslavia (ICTY) in the case of Karadzic-Mladic has stated that only actions of *exceptional severity* should be considered genocide [ICTY 1996, 15-16]. The International Criminal Tribunal for Rwanda has concluded that genocide is impossible without a *plan* [ICTR, 1999, para.94; ICTY 1999, para. 101].

From the above presented legal analysis and comparison of historical data can be concluded that the crimes committed in January 1990 in the city of Baku of the Azerbaijani SSR correspond to the elements of the crime of genocide. Nevertheless, it should be noted that from the point of view of both the responsibility of states and the international criminal responsibility of individuals, the threshold for proving the special intent of the crime of genocide is considered to be the highest.

In the aforementioned context, it is necessary to also consider the crime against humanity. Article 7 of the International Criminal Court of the Rome Statute [UN General Assembly 1998], adopted in 1988, stipulates that the "crimes against humanity" must be committed *as part of a widespread or systematic attack directed against any civilian population.*

An analysis of the characteristics of the objective aspects of crimes against humanity, the comparison of the presented evidence of the events against the Armenians of Baku, demonstrates that even if the cited facts do not prove "beyond a reasonable doubt" the existence of genocidal intent, the mass massacres fall at least under the category of crimes against humanity.

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Organization, management, economic consequences, and legal qualification of massacres of Armenians in January 1990 in Baku

Key words. Baku, pogrom, massacres, genocide, economic losses, crimes against humanity, ethnic cleansing, Armenophobia.

Anti-Armenian pogroms in Baku, the capital of the Azerbaijan SSR, have become systematic and widespread since January 13, 1990. The massacres of Armenians continued for a week, until January 19. The inaction (sometimes active participation) of law enforcement agencies during the massacres, the encouragement of pogroms by the authorities, the presence of organized groups of rioters in the city prove the organized nature of the Baku pogrom and that it was controlled from one center. The Baku pogrom had painful consequences, including mass murder, deportation, and economic (material) damage. There is enough historical data about the Baku pogrom to assert that international crimes against Armenians were committed in Baku in 1990.

CRITERIA OF ECONOMIC SOVEREIGNTY AND ASSESSMENT METHODOLOGY

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Key words: sovereignty, globalization, supranational corporations, leverages of influence

Introduction. In the literature the methodology for assessing economic sovereignty has not been sufficiently studied. In assessing the criteria of economic sovereignty, the identification of the factors influencing it are of primary importance, as in case of the dominance of internal and external factors the impact may be drastically different. One of the internal factors that has a disastrous impact on the economic sovereignty is the system of leverages of influence by supranational corporations with their significant scales in the national economy, the ability to extort favourable conditions in favourable situations. External influences include foreign investments, the inflow of private remittances from abroad, and the membership in supranational structures. To assess the internal threats to economic sovereignty precisely in extorting favourable conditions, companies can be differentiated as large, international and global corporations, mostly the last two, which take the advantage of global transactions to impact countries with different leverages to make concessions, which in their turn are equal to economic sovereignty. The following article presents a system of coefficients identifying this phenomenon and a calculation model based on it.

Methodology. From the standpoint of the assessing the criteria of economic sovereignty and its level, it is of utmost importance to clarify the genesis of the factors influencing it. Whether the internal or external factors are discussed, the criteria of Diagram 1 shows the set of factors of internal and external impacts on the economic sovereignty of the state. The internal group of factors that negatively affect the economic sovereignty includes the system of leverages of influence over the state by local, foreign and transnational corporations, which have a significant weight in the national economy, i.e. the ability to extort favourable conditions from the state. Among the internal factors influencing economic sovereignty, the political realities of the state are essential, from the internal political and institutional structure to the relations between the branches of power, and most importantly, the level of democracy. The economic situation of the state, first of all, the main macroeconomic indicators, which make the resilience of the economy more or less vulnerable, as a result, economic sovereignty as well, is very significant in the internal influence factor group. economic sovereignty and the methodlogies for assessing its level may differ.

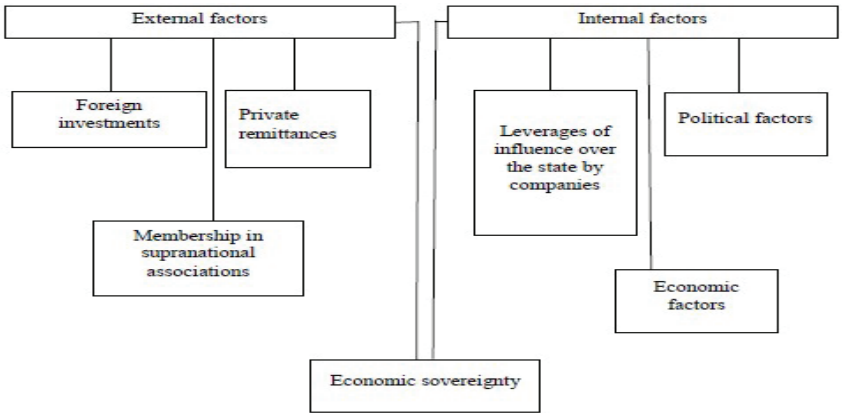

Diagram 1. Factors affecting economic sovereignty

Among the external factors affecting economic sovereignty are the leverages of influence on the state by various countries and international organizations. In diagram 1, they include the foreign investments. The foreign debt ratio in relation to GDP can be considered as a derivative criterion for assessing economic sovereignty. In the Republic of Armenia, the law defines the allowable index of state debt / GDP ratio. According to the RA Law on Public Debt, as of December 31 of each year, the government debt and the Gross Domestic Product ratio threshold of the Republic of Armenia is 60% [Law on Public Debt, 2017]. This limitation, however, is largely a measure of debt service capacity; it is not considered in the context of the impact of the debt burden on the economic sovereignty of the state.

Scientific novelty. We suggest that external threats to economic sovereignty include private transfers from abroad, a phenomenon typical of many transitional economies, including the Republic of Armenia. One of the factors of external influence is the membership of the state in supranational unions, in the case of Armenia, the membership in the Eurasian Economic Union. Along with many economic advantages, the following format of integration limits the economic sovereignty of Armenia to some extent, such as in customs policy, trade with third countries and many other areas. Thus, when the influence of the local economy increases due to globalization, the autonomy of the state to formulate and implement policies, economic sovereignty, decreases. In other words, the more globalization "touches" a particular country, the more difficult it is to maintain economic sovereignty.

Literature Review. The allocation of the "political" and "economic" components of sovereignty has been conveyed by many authors. "Political sovereignty" can be considered the right of the state to develop and implement the main directions of domestic and foreign policy. Economic policy is a component of state policy; therefore, it is lo-

gical to consider economic sovereignty (in a formal sense) as a private manifestation of political sovereignty. Meanwhile, in practical terms the economic sovereignty goes beyond political sovereignty, as it includes the need for economic self-sufficiency of the state. [Boldirev, 2021, 19-20]. The notion of "sovereignty of governments" is also distinguished. It is especially relevant because of the growing role of transnational capital, and ends up with the ability of governments to disobey the conditions dictated by that capital. In this regard, the mechanisms of economic sovereignty are vitalized, which can ensure an effective legal balance in the system of government for all subjects of economic relations. In the modern world, sovereignty cannot be considered as a entire universal mechanism control over all economic decisions. The issue is the decision-making process, which must be under the control of governments to ensure an effective level of economic sovereignty [Dogadaylo, Chepunov, Nosov, Shmaliy, 2017, 230-238].

The issue of ensuring an effective level of economic sovereignty is complex in the sense that factors conducive to economic development, if exposed to undesirable limits, can act as threats to sovereignty, such as foreign investments. In this sphere the possibility of intervening is one of the plausible manifestations of the realization of the economic sovereignty of the states. Foreign capital in the form of direct or portfolio investments is sometimes a threat to the state's economy. As the international experience shows that foreign investors, using their flexibility, are able to quickly consolidate their financial capabilities in this or that sector of the economy for maximum profit, as well as quickly withdraw their capital from the country without taking into account its state interests. The state determines its domestic investment policy by virtue of the sovereign equality of states, determining the rules of current national legislation and the availability of foreign investment in its own territory. The state, by the power of sovereign equality, in special cases, also has the right, to expropriate foreign property in accordance with its own interests, in accordance with the Constitution and International Law. [Chobanyan, 2019, 77-78]. On the other hand, the right of the state to intervene in this sphere should not become an instrument of unjustified restriction of economic freedom. Governments may be faced with the dilemma of maintaining the desired level of economic sovereignty and restricting economic freedom; in that sense, it is possible to pursue a complementary policy rather than one that excludes them. For the sake of economic sovereignty, governments must not increase their influence over economic life. As Milton Friedman writes, government is a tool for people to achieve common goals, thus it should be used sparingly. *"Government is necessary to preserve our freedom; it is an instrument through which we can exercise our freedom; yet by concentrating power in political hands, it is also a threat to freedom."* [Friedman 2021, 16].

Economic sovereignty is a multi-component, multi-layered concept, its various aspects are presented by different authors. Stephen D. Krasner, for example, views sovereignty in three main dimensions [Krasner, 2009, 30-31]:

1. International legal sovereignty
2. Westphalian,
3. Internal sovereignty.

According to him, neither logically nor empirically are these three aspects of sovereignty intertwined. States can have one aspect of sovereignty without having any others. John H. Jackson proposes a relative approach to sovereignty in the context of proper distribution of government decision-making rights [O'Hagan, 2013 12]. When decision-making takes place at a higher level than the national state, it contributes to the creation of sovereign goods, then, according to him, in that case there is no violation of sovereignty. S. Biden defines economic sovereignty as a set of the following components: the right to join international unions, equality in international economic relations, respect for other countries economic interests, the right to participate in the solution of international economic problems. [Starinskyi, Zavalna, 2021, 4]

Analysis. In order to assess the possibility of companies extorting favourable terms from the state, it is possible to differentiate between large, international and global companies, because mainly the last two enjoy the benefits of global transactions. Depending on the concentration of global or international companies in the very country and the geographical location of the assets of those companies, the country may be more or less affected by globalization. The influence of leverage or the leverage influence of global companies over states is a function that expresses:

1. The impact of the company on local economy - the "footprint" of the company;
2. The distribution of the company production assets outside its country of origin - the "globality" of the company.

The leverage of that influence can be presented as an interaction of two factors: the globality of the company and the "footprint" of the company on the local economy. Quantitatively, this can be expressed as a product of the company's globality and footprint, which will show its contribution to the domestic economy in terms of percentage, mere global assets ("non-domestic" minus "domestic") in relation to its total assets.Chart 1 shows this calculation for the two Finnish companies. The globalization of the company "UPM-Kymmene" -43, is multiplied by .065 footprint index, which provides an impact factor of -2.80. For Nokia, the .156 "globalization" index is multiplied by the " footprint" index .044, providing an impact factor of 0.69. In this case, it is to be expected that Nokia has greater leverage than UPM-Kymmene [Mitchel, 2000, 131-132]. The calculation method presented in Chart 1 with the example of two companies allows to assess the potential of organizations with a significant share in the national economy to

influence the government. Companies that not only have a relatively large weight in the national economy, but are also global in nature, have greater leverage over government. These high indicators of "globalization" enable the companies to use the threat of exit from the national economy to a greater extent, thus reducing the economic sovereignty of the state. The approach presented in Chart 1 can be considered effective not only for assessing the leverage of companies, but also for weighing the total impact of organizations with a significant role in the national economy by the same method. The problem is that if the economy of the above-mentioned country has a large number of companies with production capacity in different countries of the world, then economic sovereignty may be seriously threatened. The cumulative effect of companies extorting such concessions may ultimately lead to a cumulative weakening of economic sovereignty. This methodology solves the problem of "touchdown" globalization on the local economy. The most difficult task is how to measure the impact of globalization over the state, when the independent variable, i.e. globalization, is supranational, while the dependent variable, i.e. the economic sovereignty of the state, is national.

Chart 1. Comparison of the impact of the two Finnish corporations over the state

	Globalization *	Footprint **	Leverage ***
«UPM-ymmene»	.285-.715 = -. 430	.065	-430x.065 = -2.80:
«Nokia»	578-.422 = .156	.044	.156x.044 = 0.69:

* (Non-local assets) - (local assets) / (gross assets)

** (Local assets) / (GDP)

*** (Globality) x (Footprint)

The concept of leverage measures the interaction of globalization and local economy. The leverages of influence of individual companies can be aggregated, expressing the total impact of the "touchdown" of globalization on the state. That is, the degree to which highly mobile agents of globalization dominate the local economy taken separately. Although each of these agents is independent of the others, the sum of their individual actions has a cumulative effect. In the countries heavily involved in the process of globalization, the "national champions" of the countries have turned from international to global companies. In these conditions, the "local" global companies of the state are independent of their native country, but the native country depends on that company's contribution to the national economy. Consequently, these global companies can have leverage over countries. They may demand tax or control concessions. As a result, economic sovereignty in that country may weaken.

The leverage ratio of a global company shows the ability of a "domestic" global company to influence the economic policy of a country through a credible threat of exit from the economy of a particular country over a period of time. It is a function of two components: 1. footprint - the impact of the company on the domestic economy, and 2. globality - the degree of distribution of the company's production operations. The coef-

ficient is interactive: the company's footprint is multiplied by its globality factor, expressing the degree of leverage. Consequently, a company with a higher footprint and globality has the largest leverage, while a company with a lower level has a lower leverage. Higher leverage scores indicate higher levels of globalization, higher degrees of leverage. The individual unit of each company is added to the units of other "domestic" global companies, for each country to get the total leverage unit for a certain country for a certain period of time. The footprint index is obtained by dividing the total value of a company's physical assets in the country of origin by the country's current Gross Domestic Product (GDP). The footprint index fluctuates in the range of 0-1. The points close to the 1st indicate a bigger footprint. For example, the figure of .05 shows that the company's operations in domestic economy are equal to 5% of GDP. The index of globality is obtained by subtracting the value of physical assets of the company from the value of assets outside the country. The resulting number is then divided by the value of the company's total physical assets. The index of globality fluctuates in the range -1 - +1. A company meets the minimum threshold of being considered a global enterprise if its global unit is a positive number, i.e. if most of the company's physical assets are located outside its home country. In case of negative value, the company is mainly international, i.e. most of its physical assets are located in the country of origin. For example, a company with 60% of its assets located abroad and 40% in its home country will have 20 units of globality (60 minus 40). And vice versa, the company, whose 40% of physical assets are located abroad, and 60% in the home country, will have a globality index of -.20. The sign in front of the indicator, positive or negative, indicates whether the company is global (in case of positive) or international (in case of negative).

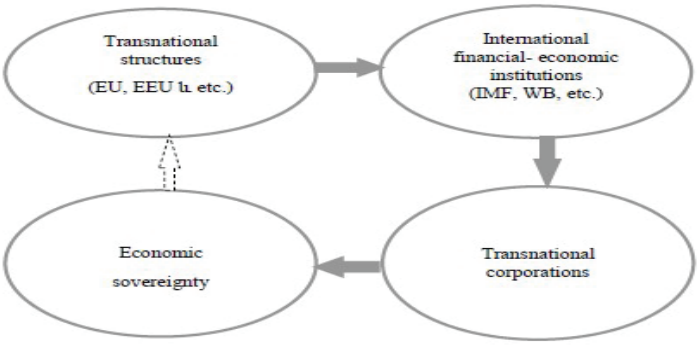

Diagram 2. The three-dimensional process of declining economic sovereignty

The decline of sovereignty during globalization is a three-dimensional process. First, it is the process of transferring decision-making power to supranational bodies, such as the European Union. Second, it is the vulnerability of states to the requirements of foreign institutions, such as the IMF, the WB, the WTO and other structures. Third, it is the process in which large supranational corporations can influence the political and

economic decisions of sovereign states. The three-step process of reducing economic sovereignty presented in Diagram 2 is a relative description, it is practically impossible to determine which of these stages affects economic sovereignty. The processes carried out at the mentioned three levels are organically connected and have a complex impact on economic sovereignty. Especially during the last two decades, global companies have increased their influence over governments, and consequently over the economic sovereignty of states. The problem is that transnational corporations gain such powerful economic power and political influence that, based on it, they are able to model the policies of sovereign states. The problem ends up with the control over resources: the world's 500 largest corporations control about 40 percent of the world's wealth.

For instance, according to the international research company "Global Justice Now", the data in 2018, 157 out of 200 economic units of the world in terms of income were supranational corporations, not states. In 2018, 69 of the 100 richest economic units in the world are corporations, not governments. Revenues of the world's top 10 corporations, including Walmart, Toyota, Shell and several Chinese corporations in 2018 . exceeded 3 trillion dollars. Transnational corporations account for 70% of world trade, with General Motors and Ford accounting for more than the GDP of sub-Saharan Africa [Coskun 2008, 1-15].

Over the past two years, the COVID-19 pandemic has affected the performance of transnational corporations. Nevertheless, they continue to have a major impact on the world economy. Revenues of 500 global companies in 2020 grew by 20 percent to $ 33.3 trillion, or more than 39 percent of world GDP. In 2016 that figure was $ 27.7 trillion, or 35 percent of world GDP. Due to the impact of the pandemic, in 2021 the revenues of 500 global companies fell by 5% to 31.7 trillion dollars, about 34% of world GDP. For comparison, let us mention that, for instance, the share of Russia in 2021 made 1.8% of the world GDP, and China - 17.8%. 500 global companies in 2021 had almost the same share in world GDP as the United States and China taken [Fortune Global 500, 2020, 2021].

Conclusions. It is impossible to accurately assess the level of decline of economic sovereignty without diagnosing the origin of the factors influencing it. Internal and exter-nal threats have a different mechanism of impact on economic sovereignty and conse-quences. Although the problem of economic sovereignty is generally conditioned by ex-ternal factors, it is expressed as the country's dependence on this or that country and in-ternational organization, but it is also quite sharp in the context of the influence of in-ternal factors. This refers to the domestic political realities, the nature of power, the level of democracy, as well as the possible leverages of influence of the states by the compa-nies that have a great weight in the national economy. First of all, global companies with production assets located in the world have such opportunities, which

create the so-called fast and inexpensive "exit opportunity", which in its turn becomes a lever of in-fluence to extort desirable conditions from the states. The methodology for assessing the level of economic sovereignty becomes quite difficult because globalization itself is a transnational concept with corresponding transnational indicators, while other criteria of economic sovereignty are national in nature. The problem arises of measuring the impact of globalization, the so-called "touchdown", which is made possible by the concept of assessing the level of globalization of companies.

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Criteria of economic sovereignty and assessment methodology

Key words: sovereignty, globalization, supranational corporations, leverages of influence

There is no common methodology for assessing economic sovereignty, there are no universal criteria. In the context of some existing approaches, it is important to determine the origin of factors influencing economic sovereignty, as internal and external threats affect economic sovereignty through completely different mechanisms. Among the internal factors influencing economic sovereignty, are of utmost importance the possible leverages of influence on the state by companies with a relatively large share in the national economy, which they use to extort more favourable conditions for business from the state. Globalization is a supranational phenomenon with supranational indicators, while economic sovereignty remains in the realm of national measurements. An attempt to solve this problem is the concept of calculating the impact of globalization "touchdown", which allows assessing the level of leverages of companies over governments through their “trace” in the national economy and their “globality”.

LABOUR MIGRATION PROCESSES AND THE INSTITUTIONAL BASIS FOR THEIR REGULATION IN EEU COUNTRIES

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Key words: labour migration, regulation of migration, personal remittances, economic growth, world oil prices, minimum wage, monthly nominal wage

Introduction: The 21st century can be acknowledged as a period of mobility, and one of its most important manifestations today is labor migration, which has been and remains an integral part of human development history. The main characteristics of the modern world economy are the liberalization of economic processes, including migration flows. In this framework, the study of the movement of people and the identification of problems related to migration is more than relevant. In the modern world, the scale and inclusion of migration has led to the fact that regulating and managing migration flows are crucial for their effectivity. It should be noted that regulation of migration has become a challenge for both countries of origin and destination. In 2015 Armenia's membership in the Eurasian Economic Union (EEU) has created the need for new institutional changes. The integration union gives the member states an opportunity to take advantage of the common market, which can become an both opportunity and threat for Armenia. In this context, the clarification of the mechanisms for regulating labor migration is on the agenda both for the EEU and for Armenia, which is one of the countries of migration of origin among the integration union.

Literature Review. There is no common approach in the economic literature according to which it will be possible to comprehensively introduce the term "migration". In general, it is quite difficult to define the concepts of "migration" and "migrant". D. Massey assesses that international migration is defined by unrelated theories, there is no comprehensive approach to it [Wickramasinghe, Wimalaratana, 2016]. A number of economists cite "push" and "pull" factors as the main motivation for migration for people. In the case of push factors, the situation inside the country forces people to leave the homeland, and the pulling factors are presented in a more positive aspect [Gerber, 2014]. Neo Classical Theory of International Migration Explains the Impact of Labor Migration on Economic Development [Arango, 2000]. International migration is defined as a regional disproportion between labor supply and demand. L. Kurekova criticized this theory, noting that it does not take into account the imperfection of the market, and makes migration primitive [Kurekova, 2011]. This theory is based on wage differences between countries. Even if social, political, cultural and many other reasons for migration are ruled out, the theory does not take into account the fact that in real life migrants

are not always fully informed about real wages and working conditions in the host country [Skeldon, 2011]. The main tenets of The New Classical Theory have been denied by the New Economics of Labor Migration. The main novelty of this theory was that migration shifted from the micro level to the meso level, where the main subjects are families, households and other associations. M.J. Piore presented the Dual Labor Market Theory, which differed from the micro level models [Piore, 1979]. This theory removes international migration from the decision-making model of individuals and defines it as the result of the labor demand of industrialized societies. The shortcoming of the theory is that it tries to substantiate international migration only by the presence of pulling factors, while the coverage of migration is much broader and deeper. Another theory, Migration System Theory, considers migration at the macro level [Kritz, Lim, Zlotnik, 1992]. Population migration also includes labor migration, but their goals are different. International labor migration is the movement of work-aged people to different countries in search of work, realizing their livelihoods and improving conditions [Nazaryan et al., 2012]. To sum it up, there are many views, theories and approaches to international migration. However, they serve as a theoretical guide to assessing the impact of international labor migration on both local and the global economies.

Methodology. The theoretical, informational and methodological basis for the article are the works of Armenian and foreign economists, classical and modern economic theories about international migration, international conventions regulating the sphere of international migration, decisions, reports and strategic programs of state bodies of EAEU countries, as well as reports of state and private organizations. Sources of information collection were the statistical committees of EAEU countries, publications of international organizations such as UN Economic and Social Council Statistical data etc.

In this article the author used quantitative research methodology. With quantitative methods author did statistical analysis to answer their research questions. Also, for comprehensive understanding of issue the author has used statistical summarization, comparison, time series analysis methods, etc. There are two methods used by economic theory: the hypothetical-deductive method used principally by neoclassical economists, and the historical-deductive method adopted by classical and Keynesian economists. Both are legitimate, but, since economics is a substantive, not a methodological science, whose object is the economic system, the later method is more adequate. The hypothetical-deductive permits that the economist, starting from some basic assumptions – principally the maximizing agent, deduces a consistent and mathematical theory, but at the cost of realism and relevance. So in this article, the author also used the main idea of the hypothetical-deductive method.

Analysis. In the EEU member countries demographic issues are common to the ones which are widely spread in many other countries. But the problem is that if Western

European countries are able to "neutralize" low birth rates through migration flows, the economic problems in the EEU countries reduce the level of attractiveness for migrants. Nevertheless, migration processes within the EEU are one of the most important issues of integration. The data in Table 1 shows that the migration balance for Kyrgyzstan, Armenia, and Kazakhstan is negative for study period. It can be stated that migration processes in the EEU countries have a great impact on the socio-economic situation of the countries. At the same time, the nature, scope and significance of migration are different for the EEU countries.

Table 1. Net Migration in EEU countries, 2011-2020

	Armenia	Belarus	Kazakhstan	Kyrgyzstan	Russia
2011	-28500	9900	5096	-39403	319761
2012	-9400	9328	-1426	-7487	294930
2013	-24400	11643	-279	-7203	295859
2014	-21800	15722	-12162	-7757	270036
2015	-25906	18494	-13466	-4229	245384
2016	-24792	7940	-21145	-3965	261948
2017	-23962	3874	-22130	-3925	211878
2018	-18286	9362	-29121	-5390	124854
2019	-16000	13870	-32973	-6160	285792
2020	3300	-	-17718	-4861	106496

Russia has traditionally been a center of gravity of migration for countries in the region. 2009-2020 the share of other EEU member states in Russia's migration balance was 32% in average. The analysis of the data of the Federal State Statistics Service of Russia shows that in both 2019 and 2020, the biggest number of citizens of the EEU countries entered Russia were from Kazakhstan (86311 people), which is 41.7% more compering with previous year. Among the EEU countries the second place is Armenia, from where the difference between the number of citizens who entered Russia and left Russia was 267987 people during 2009-2020. During the whole observed period, only in 2020, Russia's migration balance with Armenia was negative (-1844 people). The analysis shows that the average annual growth rate of people entering Russia from Armenia in 2009-2020 was 8.3%, and the average annual growth rate of citizens leaving from Russia to Armenia was 68.2%. The average annual growth rate of citizens entering Belarus from Russia during the same period was 14.6%, and the average annual growth rate of citizens leaving from Russia to Belarus was 24.9%. In general, 32.9% of the citizens who entered Russia in 2019 are from other EEU member states, and in 2020 - 33.6%. According to the Russian Ministry of Internal Affairs, a total of 68,512,638 people were registered for migration in 2016-2020, from which an average of 29.2% per year for work. The share of persons registered with migration from other EEU member states in Russia during the study period was an average of 16%, and the share of persons registered with the purpose of migration - 16.6%. 364581 people were registered for mig-

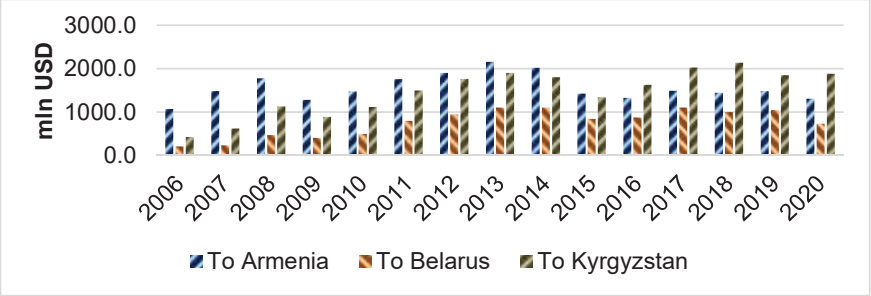
ration from Armenia to Russia in 2020, from which 18.9% was for work purpose. Because of the impact of the COVID-19 epidemic compared to 2019, the number of people registered for migration from Armenia to Russia decreased by 43% in 2020. Compared to 2019, the number of people registered for migration from Belarus in 2020 decreased by about 1.8 times. About 25.7% of the 737,929 citizens of Kyrgyzstan registered for migration in Russia in 2020, and 14.4% of 419472 citizens of Kazakhstan went to Russia to work. According to the Statistical Committee of the Ministry of Economy of the Republic of Kazakhstan during 2012-2019, the negative migration balance amounted to 132,738 people in the country. Due to the spread of COVID-19 in 2020, for the first time in the last 7 years, the number of people leaving Kazakhstan has not increased, but decreased. It should be noted that despite the negative migration balance in recent years, external migration can not be considered a challenge for Kazakhstan, given its share in the total population. However, the negative migration balance indicates the socio-economic problems in the country. According to the Ministry of Internal Affairs of Belarus, the number of foreigners entering Belarus was 4.79 million, and the number of people leaving was 5.13 million. At the same time, the data of the Statistics Committee of Belarus show that many people left Belarus for Russia, Ukraine, the United States, Germany, Poland and the EU. The Kyrgyz Republic remains a country of origin for migrants, most of whom are working. High unemployment rate and low wages are the main "push" factors of emigration from Kyrgyzstan. Russia (640 thousand people), Kazakhstan (35 thousand people) and Turkey (30 thousand people) are the main destinations for Kyrgyz migrants. The interest of migrants in EEU is conditioned by the geographical location, cultural commonalities, as well as large diaspora that already exists in those countries.

The analysis of the migration situation in the EEU countries makes it clear that for the member states of the integration union, labor migration is an ambiguous phenomenon, which is quite sensitive to the socio-economic situation of the EEU member states and is directly related to current world economic developments. COVID-19 pandemic conditioned decrease of passenger transportation both in the EEU area and around the world. As a result of the situational analysis of the EEU labor migration, the problems that exist in the migration processes of the integration union are obvious. In particular, the lack of a general methodology for migration statistics is a priority, which has posed a serious challenge to the comparability of the migration situation of the EEU member states. In addition, a number of factors, including socio-economic, environmental, political, etc., have reflected on migration flows and their ethnicity among the EEU member states. Labor migration in EEU countries affects the well-being of households, and thus the general economic situation. In order to assess the impact of international labor migration on the economies of the EEU countries, a comparative analysis of a number of important statistical indicators was carried out, revealing the interrelationships between economic processes in the context of migration. Compared to 7.5% economic

growth in 2019, -7.6% economic growth was registered in Armenia in 2020, and remittances decreased by 12% (1311.7 million US dollars in 2020).

In general, the Belarusian economy is based on the processing and re-export of Russian raw materials, which is why in 2015 the challenges in the Russian economy hit the Belarusian economy as well. And, of course, is the aftermath of the impact of the COVID-19 epidemic Belarus recorded 0.9% economic decline, with the lowest rate in the EEU countries. A similar picture emerges in the analysis of the economic situation in Kyrgyzstan. Kyrgyzstan's economy is heavily dependent on foreign financial support, including the Russian financial market. In addition, in the case of Kyrgyzstan, the country's socio-economic indicators depend on world gold prices. Kyrgyzstan earned 3774 million USD due to Kumtor gold mine in 1994-2018. The impact of COVID-19 is obvious on the economy of Kyrgyzstan, where in 2020 the worst economic growth rate in the EEU countries was recorded (-8.6%).

Chart 1. Personal Remittances to Armenia, Belarus, Kyrgyzstan, 2006-2020



Remittances from individuals to Kyrgyzstan increased by an average of 14.3% per year during 2006-2020. Moreover, from EEU member states only Kyrgyzstan 2% increase in remittances was registered in 2020 comparing with previous year. During 2014-2017, remittances from Russia decreased by an average of 45% compared to the previous year. The main reason for the economic sanctions against Russia were the recent events in Ukraine and Crimea. In addition, the economies of both Russia and Kazakhstan have been directly affected by falling world oil prices, as both countries continue to be heavily dependent on exports of oil and other commodities. During 2018-2020, the share of revenues from oil and gas exports in the budget of Russia was reduced by an average of 22% per year, from 46.4% in 2018 to 28% in 2020. According to the Federal State Statistics Service of RF, in 2020 the share of oil and gas in Russia's GDP fell to 15.2% instead of 19.2% in 2019. The average price for a barrel of Russian Urals oil in 2020 fell by 34.4%, reaching the lowest level since 2004 ($ 41.7).

World oil prices and economic growth in Russia and Kazakhstan have shown signs of interaction. In particular, the decline in world oil prices was accompanied by a slowdown in economic growth in Russia and Kazakhstan. Such a direct impact could not

but affect the general economic situation of the EEU countries, and particularly on the free movement of labor resources in the territory of the Union. Because of the economic events in Russia at different stages (global financial crisis, economic sanctions, falling world oil prices), remittances from Russia to other EEU member states have decreased. During 2006-2020, remittances from Russia to other EEU countries averaged 9.1% of total remittances. Because of the socio-economic consequences of the COVID-19 epidemic in 2020, remittances from Russia to Kazakhstan decreased by 70.2% compared to 2018, amounting to 237.4 million US dollars.

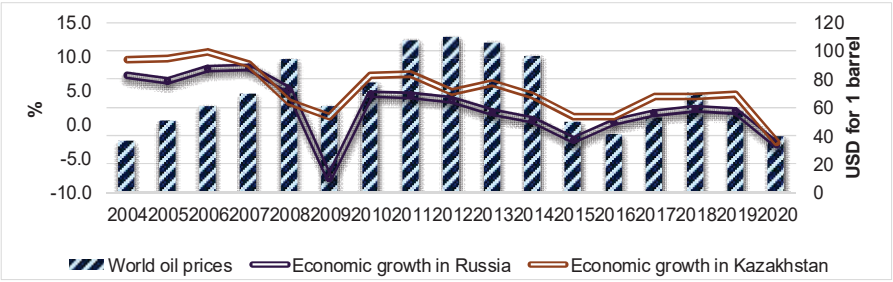
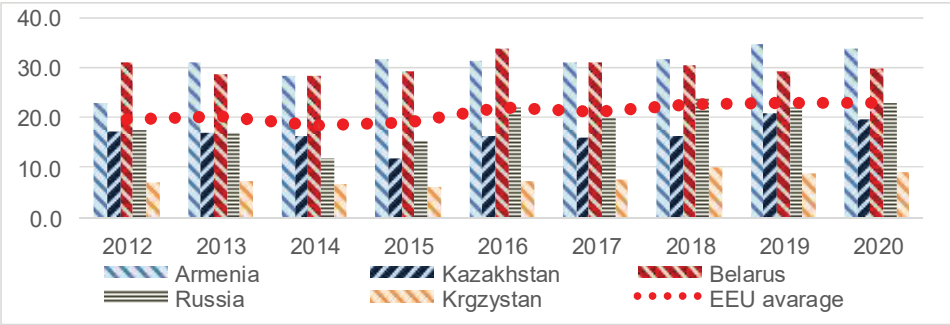


Chart 2. Economic growth in Russia and Kazakhstan (%), oil prices (USD for 1 barrel)

The study of unemployment and poverty levels in the EEU countries showed that Armenia and Kyrgyzstan have relatively high levels of these indicators. In particular, the poverty rate in Armenia in 2012 compared to 2020 decreased by 6.7% to 25.7%, and in Kyrgyzstan by 12.4% to 25.6%. The lowest poverty rate among the EEU member states was recorded in Kazakhstan (average 3.5% in 2012-2020). Poverty rate in Russia in 2015 increased by 2.1% compared to the previous year, amounting to 13.3%. The highest poverty rates in 2012-2020 were registered in Armenia and Kyrgyzstan - around 29%. A study of the average monthly nominal wages and minimum wages in the EEU countries shows that the lowest figures are in Kyrgyzstan, where in 2020 the average monthly nominal salary is 245 USD and the minimum wage is 22 USD. The minimum wage in Armenia in 2020 is 20.1% lower than the same indicator in Russia (131 USD in Armenia, 164 USD in Russia), but much higher than the average in the EEU where it is 114 USD. The average monthly nominal salary in Armenia is almost twice lower than in Russia (388 USD in Armenia, 714 USD in Russia). When comparing the minimum wage with the average wage, ILO research shows that this ratio varies greatly from country to country, but more often it fluctuates around 0.4. The share of the minimum wage in the average salary in the EEU countries for 2012-2020 has been calculated. Armenia is in the best position among the EEU member states, as the minimum wage is 33.8% of the average wage, which is close to the 0.4 calculated by the ILO. Belarus is quite close to Armenia. The share of the minimum wage in the country in 2020 was 29.8% of the average salary. In this regard, Kyrgyzstan and Kazakhstan are in a rather bad position in the EEU countries in 2020. In particular, the average monthly nominal

salary in Kazakhstan in 2020 exceeded the minimum wage by about 5 times, and in Kyrgyzstan - more than 11 times. Thus, the EEU is a platform for deepening integration processes and providing new opportunities, which will lead to the realization of the economic potential of the member states and increase international competitiveness. In recent years, the global economic situation has had an objective and subjective impact on the economies of the EEU member states, thus complicating the effectiveness of integration union. At the same time, there are internal problems and challenges in the EEU.

Chart 3. The share of the minimum wage in the average monthly nominal wage in the EEU countries, 2012-2020, (%)



In general, the EEU is, first of all, a project of economic integration, where the functional activity of the common labor market has great importance. This is why the main restrictions on migration issues in the EEU policy regulations have been removed for the member states, ensuring both the full inclusion of the migrant in the labor market of the EEU member and the guarantees of his social protection. However, migration in the EEU is unregulated, despite ongoing initiatives and reforms. This has led to a large proportion of informal employment, violations of migrants' labor rights, and disproportionate regulatory mechanisms. Effective regulation of migration has great importance for the development of the EEU member states, and mistakes can be quite costly! At this stage, it is already crucial to level the migration legislation of the EEU member states with a number of inconsistencies. At present, migration policy in each member state is implemented separately or unsystematically. Each country pursues its own migration policy towards third countries, based only on its own interests and benefits. Improving the contractual legal basis of labor migration has great importance.

Conclusions. When analyzing and presenting the mechanisms for regulating labor migration, it should be noted that the labor rights of migrant workers in the EEU member states are not yet fully protected. In this context, the existence of flexible labor protection mechanisms is especially important. The existence and need for sustainable migration infrastructure are on the agenda for the EEU member states. This will make it possible to effectively regulate the availability of information on vacancies in the EEU member states, as well as to regulate the issues of employment and social protection. Ul-

timately, all this will make it possible to correctly assess the labor migration potential of the EEU member states by redistributing labor resources from areas with surplus labor to countries where there is a shortage of labor. The creation of a migration information platform can be a great opportunity to regulate migration flows within the EEU. The online information platform will provide an opportunity to download information on vacancies in the EEU area with job descriptions and descriptions of skills and abilities required for the job. This will provide diversification of migration flows for the EEU member states (including Armenia), whose main preferred destination is Russia, which is very important in terms of protection against external shocks. The information network should reflect the situation in the labor market in the EEU member states, both for the whole EEU territory and for individual regions. The creation of unified and detailed information network can become one of the levers for the efficient distribution of labor resources in the EEU. In this context, the common approach of the EEU member states in the classification of migrants is important, as well as the availability of general statistical information, analysis, and interdependence within the union. It is quite difficult to manage the migration flows, to keep the statistics. It is difficult to get a clear idea of the main structure and situation of migration processes within the EEU. In this context, the leveling of the statistical systems of the EEU countries is of primary importance, which will make it possible to clarify the status of "working migrant", by which it will be possible to assess the situation and identify the necessary solutions. In the EEU, a targeted approach to the migration of highly skilled labor is paramount. The creation of a common educational platform, the improvement and leveling of educational infrastructure will provide a favorable environment for migration of highly qualified professionals in the EEU area. In this case, it is very possible to prevent the "brain drain" from the EEU countries to third countries. At the same time, the creation of knowledge-based, innovative economies in the EEU is the best way to prevent "brain drain" also neutralizing a number of socio-economic problems. It is important for the EEU member states to develop joint mechanisms to combat illegal migration from third countries. The work carried out with EEU and relevant international organizations is of great importance. Labor migration is a key precondition for establishment and development of Eurasian integration, which reflects on the socio-economic situation of the EEU countries. Therefore, as a primary tool for leveling the integration union, it is always necessary to clearly ensure the smooth operation of the migration policy and its maximum usefulness for the member states.

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Labor migration processes and the institutional basis for their regulation in EEU countries

Key words: labour migration, regulation of migration, personal remittances, economic growth, world oil prices, minimum wage, monthly nominal wage

The main characteristics of the modern world economy are the liberali-zation of economic processes, the increasing flows of capital, technology and people. The study of problems and challenges of migration is crucial. Migration issues in Armenia especially in the framework of EEU have always been relevant. The analysis of the migration situation in EEU countries gives an opportunity to reveal the deep reasons hindering the development of integration union. Labor migration is an economic phenomenon, with the help of which the state at different stages of socio-economic development can solve the problems of providing the labor market with means of labor, reduce unemployment, increase investment. Over the years, the migration processes in Armenia, their causes and consequences, the groups involved and their problems have changed significantly. Armenia's membership in the EEU has a significant impact and importance on these changes. Migration issues in Armenia, especially within the EEU, are always relevant.

COMPARATIVE ANALYSIS OF TERRITORIAL GOVERNANCE AND LOCAL SELF-GOVERNMENT SYSTEMS OF THE RA AND EU COUNTRIES

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Key words. Local self-government, administrative-territorial reforms, decentralization, administrative control

Introduction. In the context of the administrative-territorial reforms implemented in the Republic of Armenia, it is topical to discuss the territorial self-government systems, as well as the administrative-territorial reforms being implemented in other countries and the results of that reforms.

Within the framework of the research, we have also presented the relations between the state government and local self-government bodies, in particular, the control mechanisms implemented by the state government in Bulgaria, Latvia, Estonia, Sweden and Armenia. In addition, the level of decentralization in the mentioned countries was described and compared with the level of decentralization in the Republic of Armenia.

Methodology. The research is based on the legislation related to the state and local government systems of Armenia and the respective EU countries. In addition, the analyses were performed using statistical data published by Armstat.am and Eurostat.eu. The methods of induction, statistical analysis and comparison were used.

Scientific novelty. We suggest to use the experience of the discussed countries and RA in the systems of territorial administration and local self-government was presented, then the problems existing in our country in these respects are raised by the method of induction. Statistical analysis is used to calculate the budget expenditures of different communities of Armenia, the GDP, as well as the share of those expenditures in the GDP. The comparative analysis is conducted to assess the nature of administrative-territorial reforms carried out in the Republic of Armenia and other countries under discussion, as well as the state control over activities of local self-government bodies.

Literature review. The issues of the local self-government system development, the clarification of relations between local self-government bodies and state authorities through administrative-territorial reforms have been repeatedly discussed in the literature. We study the experience of the countries we have selected in this regard.

Administrative Territorial Division of the *Republic of Bulgaria* by the Constitution stipulates that the territory of the country is divided into regions and municipalities. There are 28 administrative regions in Bulgaria including the city of Sofia which is set as a separate administrative unit with the status of a region (https://ec.europa.eu Official website of the European Commission). Local self-government is implemented in com-

munities, and state administration in the regions. At the community level, local self-government is exercised through two elected bodies: the municipal council and mayor (executive body). The region is governed by a regional governor appointed by the Council of Ministers and is aided by a regional administration. He ensures the implementtation of the State's policy, the safeguarding of the national interests, law and public order, and exercises administrative control (https://cor.europa.eu/en Official website of the European Committee of the Regions). In the early 1990s, municipal reforms began in Bulgaria, the main element of which was the restoration of regions (existing until 1987) and regional governors.

According to "Reforming local public administration. Efforts and Perspectives in South-East European Countries" regional governors placed the accent of their work on monitoring local self-government and local administration and, in practice, they started taking over the competences of the municipalities. This was in combination with the amendments introduced into the Local Elections Act, which deprived the settlements with less than 500 inhabitants from the right to elect directly their mayors, hence it represented a regression of local self-government practices. During this period, a significant counterpoint to this tendency became the constitutional right to unite, employed by the municipalities, which resulted in the establishment of a strong union - the National Union of the Municipalities in the Republic of Bulgaria - which was national, and independent of the political "colour" of individual mayors and municipal council majorities. The Union commenced serious work on problems concerning the reforms of local self-government and local administration.

On one hand, the strategy of modernisation of state administration from accession to integration in short terms 2003 - 2006 was updated. On the other hand, due to the competent pressure exercised by the National Union of the Municipalities, the Government made serious steps towards the financial provision of the shared, and delegated, functions of the municipalities. [Stiftung, 2004, 33].

In compliance with the Constitution of *the Republic of Lithuania*, there are two types of territorial authoriries: municipalities and «higher territorial units» or counties. The administration of county is organised by the government of the Republic. They vary in size, from four to eight municipalities. [Moreno, 2012, 391]. As part of territorial-administrative reform, since July 1, 2010 the regional administrations (Administrations of the Governor of the Region) have been abolished. Currently, regions serve as territorial and statistical units only and their functions were distributed among municipalities (minority) and the central government bodies (majority). (https://cor.europa.eu/en Official website of the European Committee of the Regions). The system of local self-government of Lithuania is one-trier. In this country, local self-government is exercised in the communities. Municipal councils and mayors are elected by the community residents.

Estonia has a one-tier system of local self-government. The activities of a municipality are organised and managed by a council, which is a legislative body of a local authority. The council is elected at general and direct elections, and the work of the council is managed by the chairman, who is elected by the majority of council. The council appoints a municipal board as a collegiate executive body for the duration of its authority and determines the number of board members. The head of a board is the mayor, who is elected and removed by the council (Valner, page 24-25).

In July, 2016, the Administrative Reform Act was passed, which determined all local government units must have a territorial organisation of at least 5,000 residents. Until the end of 2016, local government units that did not fulfil this criterion could negotiate a merger at their own initiative and were provided financial incentives for that. The aim of the reform was to increase the capabilities of local government units, the municipalities, and to ensure a more consistent regional development (https://cor.europa.eu/en Official website of the European Committee of the Regions).

There are two levels of local governance in *Sweden:* regional (formerly counties) and municipal. The regions represent both a level of self-government and of de-concentrated State authority. Regions and municipalities are responsible for regional/local matters of public interest, and there is no hierarchy between the two levels of self-government, just different areas of responsibilities (https://cor.europa.eu/en Official website of the European Committee of the Regions). At the local level there are directly elected municipalities. At the regional level there are directly elected county councils. In addition, there are central government agencies at regional level: a general purpose county administrative board in each county and regional branches of specialized central government agencies (which may cover other territories than counties). Local self-government has a long tradition in *Sweden*. The country's municipalities and regions have a considerable degree of autonomy and have independent powers of taxation. They are responsible for providing a significant proportion of all public services. Municipalities are responsible for providing services in many areas, while the primary responsibility of county councils is to provide medical care and manage regional hospitals. Another area of responsibility is regional development. The county councils and regions support business and industry in their area and encourage new enterprise. They also responsible for areas such as tourism and culture (to some extent) and public transportation. Each municipality and county has one decision-making body: the municipal assembly in the municipalities and the county council assembly in the county councils [Moreno, 2012, 639].

Analysis. Within the framework of administrative-territorial reforms in the Republic of Bulgaria, the regions were restored together with their governors. In general, from the point of view of the relations between the territorial administration bodies and the local self-government bodies, the situation is quite similar to the Republic of Ar-

menia, as here the governors interfere in the implementation of the powers vested in the local self-government bodies. In Bulgaria, however, the problem has eased considerably when the country has implemented relevant reforms to join the EU. In addition, the formation of the National Union of Communities, which protects the interests of communities, has played a significant role.

Table 1. Administrative division of RA and EU countries

Country	Administrative units	Local self-government system	The nature of administrative-territorial reforms
Bulgaria	28 regions, 265 communities	One-tier	Restoration of regions and regional governors
Lithuania	10 counties, 60 communities	One-tier	Elimination of territorial administration bodies
Estonia	15 regions, 79 communities	One-tier	Enlargement of communities and elimination of territorial administration bodies
Sweden	21 regions, 290 communities	Two-tier	Significant changes in the system of local self-government did not occur.
Armenia	10 regions, 483 communities (as of January 1, 2021)	One-tier	Enlargement of communities (reforms are underway, as a result of which it is envisaged that the number of communities in Armenia will be 78)

Both in the Republic of Lithuania and in the Republic of Armenia, there are 2 administrative-territorial units: regions and communities. The regions in Lithuania have a historical and statistical nature. In contrast to this country, Armenia still retains territorial administration bodies that implement the territorial policy of the state.

According to the Ministry of Finance of Estonia (2019), as a result of the local government administrative-territorial reform the number of municipalities decreased from 213 to 79. 160 local governments out of 213 amalgamated voluntarily (i.e. 86%). 26 local governments remained who didn't pass the minimum criteria and failed to present a proposal for merger. The Government of Estonia initiated merger processes for all of them except the 4 maritime islands (municipalities) which got the exemption in accordance to the law. The Ministry considers that previous mergers of local governments have demonstrated that better and more accessible services are provided with joined forces and the competitiveness of the region improves [Semigina, et al., 2020, 213]. The county governments along with county governors were abolished with the 2017 administrative-territorial reform, and their tasks were transferred to ministries, other government bodies or municipalities. There are regional agencies that exercise centrally managed policies at the regional level and provide co-ordination in some areas.

As we can notice, in Estonia, as in Armenia, processes of community enlargement have been implemented, which have mainly pursued similar goals. In Estonia, however, the emphasis was on the voluntary merging of communities. The state presented conc-

rete demands, and in case of non-compliance with them, offered to unite. Only after the unification, on the basis of applications submitted by the communities, the state begins to intervene, to merge those that have not submitted the above-mentioned applications.

The approach is differnet in Armenia. Referendums were organized in the respecttive communities within the framework of the pilot program, but then the unification took place on a not voluntary basis, and the communities subject to unification were decided by the state. This, of course, is a gross violation of democracy and participatory governance. We think it would be better to maintain the organization of mergers based on the results of referendums. First, it would allow taking into account the opinion of the residents of the communities. Also, the residents would not initially have a bad disposetion about the enlargement process, as it would not be perceived as a mandatory event.

Table 2. Organization of control in communities of RA and EU countries

Country	Mechanisms of control over local self-government bodies
Bulgaria	The regional governors supervises the legality of the acts of the municipal council
Lithuania	The government representative oversees the communities under his or her jurisdiction
Estonia	The Ministry of Justice exercises administrative control over the legality of community acts
Sweden	Municipal appeal as a means of controlling local governments
Armenia	Organization of control through regional administrations

According to the Local Self-Government and Local Administration act of Bulgaria, regional governor exercise control for the lawfulness of the acts of municipal councils. He/she can bring the unlawful acts back for new consideration by the municipal council or to dispute them before the respective administrative court. The appeal suspends the application of individual and general administrative acts and the application of sub-legislative legal acts, unless otherwise resolved by the court[1].

According to the Act on Administrative Supervision of Municipalities, the compliance of municipalities with the decisions of the national Government is supervised by specific State officers. In each of Lithuania's 10 counties, a government representative, as an independent constitutional figure (directly subordinate to the central Government and accountable to the Prime Minister) supervises the municipalities under his jurisdiction (usually, from four to eight). The main executive function of the national government representative is to supervise whether municipalities follow the Constitution when adopting rules and regulations, and whether local bodies respect the laws when executing governmental decisions. The national government representative advises local authorities to cancel or change illegal legal acts and mandates compliance with the law.

[1] Local Self-Government and Local Administration Act of Bulgaria, article 45 . 4 https://www.mrrb.bg/en/local-government-and-local-administration-act/

If, after having discussed a representative's decision, a municipality refuses to modify or cancel a given local ordinance, then the representative of the national government reports to the court by filing a legal challenge [Moreno, 2012, 406].

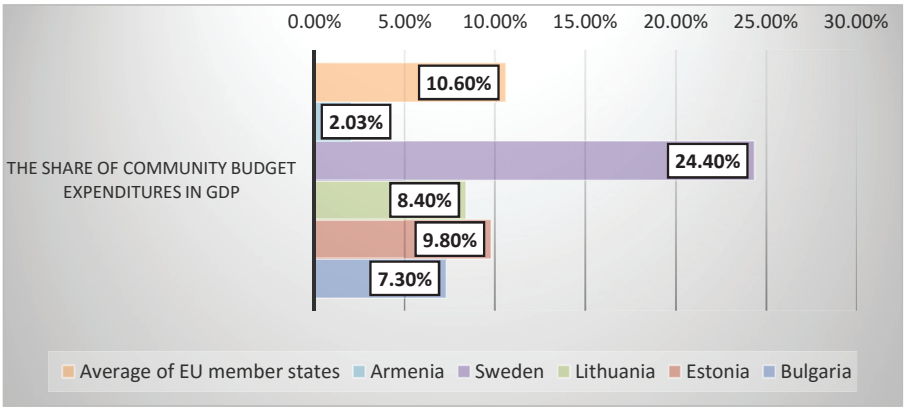
The Local Government Organisation Act specifies that the Ministry of Justice exercises administrative supervision over local authorities. In the past, this fell to county governors, but the 2017 territorial reform brought an end to their role. The Government of the Republic Act specifies that supervision by the Ministry of Justice concerns the legality of municipal acts. In the event of breaches (or omissions), the ministry may make a written proposal to repeal or amend (or issue) the act in question. If the local authority fails to rectify the situation within 30 days, the ministry may then refer the matter to the administrative courts [Young, 2020, 17-18].

Municipal appeal plays an important role in the external control mechanisms of local self-government bodies in Sweden. Members of the community (other than residents also, for example, a person who owns a property in a community) have the right to appeal against local government decisions in an administrative court. The main feature of municipal appeals in this country is that there is no need for a legal interest to have the right to appeal against decisions. A municipal appeal is an actio popularis form of appeal not found in any other European country. This is a way for community members to oversee the legality of large-scale local decisions. The only requirement to file a complaint is to be a member of the community. The basis of such an approach is how local self-government is perceived in Sweden. Communities are the unions of their members, so those members should have the right to control and influence the community. Local authorities are also subject to administrative supervision by the County Administrative Boards. Even in a country like Sweden, where central-local relations are largely cooperative, there are cases of serious official sanctions. However, sanctions are the exception rather than the rule; there are many other mechanisms in place to ensure compliance and prevent problems [Young, 2020, 72-73].

According to the RA Law on Local Self-Government, legal and professional control is exercised over the activities of local self-government bodies, which can be exercised by the relevant authorized bodies directly or through regional governors. As a rule, this control is carried out by the regional governors, and it is one of the main functions of the RA territorial administration bodies. However, as we can see, in the Republic of Lithuania the control is successfully organized through the special bodies (representatives) appointed by the central government; and in Estonia - through the relevant ministry. This means that it is not necessary to keep the regional administrations in order to control the legality of the activities of local self-government bodies. As we mentioned, the system of local self-government is quite developed in Sweden. In this sense, a newly independent country like Armenia has a lot to learn from such an experience. We believe

that the municipal appeal mechanism can be introduced in the communities of Armenia only in case of development of the local self-government system; when the community residents will consider themselves the most important members who formed the community, elected their governing bodies and are obliged to monitor their activities. Such a system significantly reduces the efforts of the central government, as well as the resources spent on overseeing activities of local self-government bodies. It is also important to discuss the degree of decentralization in the above-mentioned countries. A significant indicator of local government financial independence and decentralization is the share of community budget expenditures in GDP.

Figure 1. The share of community budget expenditures in GDP[1]



As can be seen from the chart, the share of budget expenditures of the communities of the Republic of Armenia in the GDP is 2.03%, which is quite lower than the average of the EU countries. This means that the level of decentralization is still quite low in Armenia.

Conclusion. Having studied the systems of local self-government in a number of EU countries and RA, we came to the conclusion that:

- Territorial administrations have been abolished as a result of administrative reforms in Lithuania and Estonia. The number of communities is close to the expected one in Armenia after the enlargement, so our country may eliminate the regional administrations and run the territorial administration based on mentioned countries' cases.
- In Estonia community enlargement let local governments decide which communities to merge with, and instead the state has offered financial incentives to them. However, if there was no agreement between the communities, the enlargement was imple-

[1] The diagram was made by the author based on the data provided in the following links
http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do
https://armstat.am/am/?nid=12&id=01001

mented by a government decision, forcing the local authorities to unite. This process started later, when the effectiveness of the already united communities became obvious. Therefore, the enlargement of communities in Armenia differs significantly from the democratic enlargement processes in EU countries.

- In Sweden, the institute of municipal appeal significantly reduces the need for oversight by public authorities. We think that such relations of community management should be pursued by all countries.
- In terms of financial decentralization, Armenia lags behind the indicators of EU.

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Lilit MKRTCHYAN

Comparative analysis of territorial governance and local self-government systems of the RA and EU countries

Key words: local self-government, administrative-territorial reforms, decentralization, administrative control

The article is devoted to the study of the territorial and self-government systems, their reforms over the years, as well as the observation of the existing relations between those systems of a number of EU countries and the Republic of Armenia. Within the framework of the research, we analyzed the organisation of control over the activities of the local self-government system in the countries separated by us, conducted in parallel with the experience of the Republic of Armenia in the mentioned field. The results of the analysis showed that the enlargement of communities in Armenia differs significantly from the enlargement mechanisms conducted in EU countries. Except for it, it became clear that the degree of decentralization of local self-government is still quite low in the Republic of Armenia. The research has also laid the groundwork for the introduction of a scientific novelty in the near future, which will relate to the relations between territorial administration and local self-government bodies, the forms of legal and professional control organized in the communities of the Republic of Armenia and the bodies that carry out that control.

RUSSIAN-UKRAINIAN CONFLICT AND ARMENIA'S FOOD SECURITY RISKS[1]

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Keywords: Russian-Ukrainian special operation, food, restrictions, self-sufficiency, supply, reserves, panic

Introduction: In international relations, the world's superpowers use their economic and geographical advantages as a weapon in accordance with their interests. In the current environment, more emphasis is placed on economic and political sanctions. The instrument of economic sanctions is primarily the restriction of international finan-cial transactions, mutual visits, as well as trade in food and fuel. Here, we are seeing its material manifestations in 2022 in the context of the Russian-Ukrainian crisis that began on February 24. Since globalization has wrapped the world in a web of political and economic integration between countries, interstate conflicts affect not only the direct participants, but also their allies. By the way, the Russian-Ukrainian conflict affects trade and economic relations with Russia, including with the EAEU countries. In this case, a more difficult situation is created for countries that are closely interconnected with the center and have relatively few alternatives. By the way, in such a situation, countries that do not have access to a wide range of food and fuel imports and affordable logistics are especially vulnerable. The article, based on current information and retrospective analysis, assesses the threats to the food security of Armenia and possible ways to overcome them in the context of the Russian-Ukrainian military crisis.

Literature review: Food security is one of the most important components of economic security and is always in the focus of attention of foreign and domestic economists. With the rapid growth of the world's population, the demand for food is increasing. Meanwhile, natural and man-made factors reduce the resource potential of the agri-food sector and reduce the world's ocean fish stocks. The Food and Agriculture Organization of the United Nations (FAO) is working hard to address and address these issues. The FAO's annual analysis of The State of Food Security and Nutrition in the World, published by FAO in 5 languages, provides FAOSTAT statistics and a variety of studies, especially as a methodological basis for food research. The economic literature pays special attention to the evolution of the concept of food security [Belugin, 2019, 122-143], state food security models [Plotnikov, Suleimanova, 2019, 7-12], integral indicators

[1] The research was carried out with the support of the RA State Committee of Science under the code 21T5B295 within the framework of the topic "Increasing Armenia's food security in the conditions of introduction of circular economy structures"

[Zhiryaeva, 2020, 49-67] of food security assessment, forecast of food demand related to demographic developments, alternative opportunities to meet that demand and other issues [Avetisyan, 2014, 96].

Research methodology: In order to present the issues discussed in this article in more detail, we have used the Food and Agriculture Organization of the United Nations, the Eurasian Economic Commission, the Statistics Committee of the Republic of Armenia, as well as the CIS food security database, food and foreign trade statistics and the Russian-Ukrainian crisis current analysis.

Scientific novelty: The Russian-Ukrainian crisis has created very realistic conditions for assessing Armenia's food security risks, when the potential for food self-sufficiency has become more than obvious. The scientific novelty of the article is that in the conditions of geopolitical conflicts the importance of diversification of the RA foreign food markets is revealed. The need to expand state support for strategically important areas of local agricultural production, economical use of food and reduction of losses is substantiated.

Analysis: Currently, when the Russian-Ukrainian crisis is on a large scale, when the number of people killed and injured is increasing, when new cities and settlements are being destroyed and the end of that catastrophe is not visible, world analysts predict a famine war and a bread crisis. It is already clear that this war is leading to a shortage of food and rising prices in the world. Due to the ongoing conflict, Ukraine is losing crops and Russia is losing export markets. In fact, sharp inflation is expected for rich countries, and poor countries for inflation and riots. Such a conclusion has good grounds, as Russia and Ukraine account for about a third of the world's wheat exports. To be more precise, Russia was the first among the countries exporting wheat in 2021, and Ukraine was the fifth[1]. The latter also had a leading position in the export of corn, especially sunflower oil (about 80%)[2].

The Financial Times cites that at the beginning of the Russian-Ukrainian events, the price of wheat on the Chicago Board of Trade immediately increased by 50%. As of March 9, the price of wheat in the world market was already more than 60% higher than at the beginning of the year.Prices have fallen slightly since March 10, but analysts expect them to rise again[3]. The export of grain from Ukraine has now been practically stopped. Moreover, even if the hostilities end at this point, spring sowing and food exports are still seriously endangered. "It is unclear what the condition of the crop collection, storage, transportation and export infrastructure will be. Besides, the opportunities

[1] https://www.kp.ru/daily/27375.5/4557207/
[2] https://latifundist.com/analytics/23-obzor-rynka-zernovyh-kultur-2021-eksport-proizvodstvo
[3] https://www.kp.ru/daily/27375.5/4557207/

for exporting agricultural products from the Ukrainian ports of the Black Sea are already few or even completely zero"[1]. Russian deliveries continue, but due to economic sanctions, there are failures that create problems not only for Russia, but also for countries that import food and mineral fertilizers from this country. In addition to the reduction of physical exports, the Russian-Ukrainian conflict due to insufficient fertilizer exports will have a negative impact on agricultural production in the European Union and a number of other countries. The price of fertilizers has also risen sharply, as the main suppliers of cheap fertilizers so far have been Russia and Belarus. Forecasts show that "the costs of farmers around the world will increase. Famine can threaten some of the poorest countries. The situation is already complicated by the coronavirus epidemic. A number of experts are already recalling the Arab revolutions of 2011, one of the reasons for which was the rise in the price of bread"[2]. Nevertheless, it should be noted that in the 2020/21 agricultural year, the world wheat harvest set a new absolute record 776.5 million tons. According to an April report by the US Department of Agriculture, this result was made possible by an increase in harvest area of 5.02 million hectares or 2% and a higher average yield of 3.5 t/ha. Harvest areas increased especially in Australia (+2.8 million hectares), India (+2.0 million hectares) and Russia (+1.4 million hectares). At the same time, the largest reduction of the area took place in EU countries (-1.5 million hectares). India is in the top five in terms of wheat sown area 31.4, Russia 28.7, China 23.4, the USA 14.9 and Australia 13.0 million hectares. The following countries have the highest yield of wheat: Germany 7.53 t/ha, France 6.8 t/ha, Egypt 6.4 t/ha, China 5.7 t/ha. Leading countries in wheat production are China, India and Russia. However, their total share has decreased from 46% in the agricultural year 2019/20 to 42% in 2020/21[3].

This threat became more substantial when on March 10, 2022, the Russian Customs Subcommittee approved a decision to temporarily ban the export of grain crops to the EEU countries. "Prime Minister Mikhail Mishustin has signed a decree temporarily banning the export of grain to the Eurasian Economic Union (EEU), as well as the export of white sugar and cane raw materials to third countries. This decision was made to protect the domestic food market in the face of external restrictions. The ban on grain exports will last until June 30, on the export of sugar until August 31, 2022. Exports of grain crops are limited to wheat and meslin, rye, barley and corn. Exceptions are humanitarian aid and international transit supplies. "Deputy Prime Minister Abramchenko has previously clarified that exports under the quota will be possible under the licenses of the Russian Ministry of Industry and Trade, and sugar exports will be possible in accor-

[1] https://www.dw.com/ru/vojna-vedet-k-globalnomu-deficitu-pshenicy-i-rezkomu-rostu-cen
[2] https://www.kp.ru/daily/27375.5/4557207/
[3] https://latifundist.com/rating/top-10-stran-proizvoditelej-pshenitsy-v-202021-mg

dance with separate decisions of the Ministry of Agri-culture"[1]. In terms of this decision, it is clarified that "the temporary ban on exports will prevent the resale of agricultural products, given that the EEU countries have already made the necessary purchases in the current season in the duty-free regime"[2].

Armenia, as shown in Table 1, imported about 266 thousand tons of wheat in 2021, 99.7% of which came from Russia. The country also accounted for 99% of the imported 24.6 thousand tons of flour, 88.58% of pasta and 32.7% of rice. As the Russian-Ukrainian crisis has shown, such a monopoly position of the exporting country is risky. Therefore, it is necessary to look for sensible ways to diversify it, at the same time to stimulate local production and increase the self-sufficiency of food items, especially the essentials.

Table 1. Data on wheat, flour, pasta and rice imported to Armenia (2020 and 2021)[3]

Name	2021 annual total	Exporting country	2020 annual total
Wheat	265599	264863 from Russia, 736 from Georgia	356329
Flour	24625	24345 from Russia, 64 from Italy, 134 from Belarus, 1 from Greece, 81 from Kazakhstan	23953
Pasta	10324	9138 from Russia, 1003 from Italy, 28 from PRC, 2 from France, 1 from Thailand, 10 from Belarus, 94 from Iran, 48 from Kazakhstan	11029
Rice	7596	3264 from Thailand, 946 from Iran, 2483 from Russia, 763 from India, 5 from Spain, 34 from Italy, 2 from Paraguay, 45 from the USA, 2 from Vietnam, 52 from the UAE	7118

The study shows that especially in recent years, the resource potential of the RA agriculture has not been fully used. For a sparsely populated country like Armenia, it is intolerable that only 50% of arable land is sown, and only 26% of total sowing is allocated to the main food crop, wheat (Table 2). Of course, this is mainly due to the low level of income from cereals. In grain-rich countries, the guarantee of a farmer's income is high yields and large-scale cultivation. Especially in the last two decades, the debate over the two main positions on the terms "food security" and "food self-sufficiency" has been ongoing. Without going into the details of the views of the parties, it should be noted that one group believes that food security is to satisfy the population with the necessary quantity and quality of food products at the expense of imported and domestically produced products, while the other side prioritizes local production. In our opinion, in order to give preference to this or that point of view, it is necessary to give a realistic assessment of the economic and geopolitical position of the country. Some of our partners point to Singapore's high food security record, claiming that the country has no agricul-

[1] https://rg.ru/2022/03/16/kabmin-zapretil-vyvozit-zerno-v-eaes-i-sahar-v-treti-strany.html
[2] https://www.kommersant.ru/doc/5251229
[3] Source: RA Ministry of Economy

ture but has the highest food security rates. In 2019, Singapore was the first of 113 countries in the world in terms of food security, and in other years, the rating of this country was quite high. At the same time, the "World Food Security Ranking" states in brief information: "In the first place, unexpectedly, is Singapore. A small country with an economy not based on agriculture at all. "But due to the high availability (both financial and technical: logistics, supply chain, etc.),

Table 2. Area of RA main agricultural crops, yield and gross harvest

Indicators	Area, thousand hectares		Yield, c / ha		Gross harvest, thousand tons	
	2020	2021	2020	2021	2020	2021
1. Total arable lands	444.0	444.0				
2. Total sown area	222.7	227.2				
of which						
2.1. Cereals and legumes	121.7	124.9	20.5	12.9	246.1	153.2
2.2.Including wheat	59.4	59.1	22.5	16.8	132.0	97.2
3. Potatoes	20.5	20.1	212.8	179.3	437.2	364.6
3. Vegetable and vegetable crops	25.3	24.0	323.8	313.0	819.4	751.2
4. Other crops	55.2	58.2				

Singapore was able to come first".Armenia and many other countries do not have the level of access to be able to fully meet the food demand of the population only at the expense of imported food. Finally, the Russian-Ukrainian conflict has once again shown that Armenia is in an unstable region in terms of security, so assessing the competitive advantages, it is necessary to increase the production of basic food products at the expense of our own production. In order not to consider this opinion naked, let us mention that, for example, we do not have a shortage of land and water resources for wheat production [Harutunyan, 2021, 107-111]. We also do not have seed production of high-yielding varieties, we do not have modern high-yield combine harvesters and infra-structure for loss-free and efficient post-harvest processes. We do not have an effective system of state support, which will allow us to partially mitigate the rise in prices for diesel fuel, fertilizers, agricultural maintenance services and insurance due to the rising dollar. Perhaps it is worthy to get acquainted with the cost of cultivating one hectare of wheat under irrigated agriculture (Table 3), calculate the income a farmer can receive in a year. Experience shows that in case of carrying out all technological processes, the ave-rage yield per hectare can be 4 t/ha, and the costs 336 thousand drams/ha (there are farmers providing 6-8 t/ha in the mentioned community). According to previous years, processing companies buy wheat for an average of 130 drams per kilogram of wheat, and this year the price may be 160 drams. Under these conditions, the producer's income from the sale of wheat will be 4000 x 160 = 640000 AMD, and the income 640000-336000 = 304000 AMD. If we take into account that in July 2021 the average monthly salary of 632410 employees of 55910 companies in Armenia was 206297 drams, it is not difficult

to calculate that the annual income of a hectare of autumn wheat cultivator is equal to 1.5 months salary of an employee of those companies. This is one of the main reasons why more than half of the arable land is not cultivated. By the way, Akhuryan's example is an exception, as not all regions of the country are irrigated and in case of the mentioned expenses 40 c/ha yield will be provided.

Table 3. Costs of wheat cultivation and harvest per hectare in autumn, following the example of Akhuryan settlement, Shirak region[1]

N	Expenses	Price, thousand drams	N	Expenses	Price, thousand drams
1.	Down	30	9.	Fertilizer (6*8000 AMD)	48
2.	Soil compaction	20	10.	Injection	7
3.	Sowing	20	11.	The cost of herbicide	10
4.	The cost of seed (350kg*200 AMD-kg)	70	12.	Spring water	20
5.	Pull a groove	8	13.	Dispenser fee	20
6.	Dispenser fee	20	14.	Harvest	30
7.	Water fee	20	15.	Crop transfer	8
8.	Fertilizer with a tractor	15	16.	Other expenses	20
	Total				366

To sum up, the EU spends more than 50 billion euros a year, or 40.0% of the total EU budget, on agri-food policy measures. The majority of these funds (about 4/5) are directed in the form of subsidies to provide direct financial support to the villagers to maintain prices and, consequently, the required level of income. The remaining 1/5 of the budget's agricultural expenditures are directed to financing the sustainable development of rural settlements, including rural infrastructure[2]".

Conclusions: The analysis shows that the risks of food security in Armenia are obvious; the question "what to do" arises again. In our opinion, the logical way out of this situation, as evidenced by international experience, is the diversification of foreign trade in food products and state support for agriculture with efficient structures. Of course, the Armenian government also implements various state support programs for agriculture. However, due to imperfect structures, they are either not targeted or, due to limited financial resources, are not actually perceived by agricultural producers. Following the experience of EU countries, we offer producers direct financial support per unit of sown area for the production of strategic agricultural products to subsidize the prices of fertilizers, diesel fuel, seeds, necessary services and some other costs. For example, the support of at least 150,000 drams per hectare for the cultivation of grain crops will enable the producers to carry out the most necessary expenses without any problems. In order to

[1] Data provided by Akhuryan resident, experienced agricultural specialist Atom Matevosyan
[2] https://1economic.ru/lib/110746

make the most of the assistance, EU uses a tripartite agreement and a non-cash payment system between the state, the service bank and agricultural producers. In this case, the responsibility of the parties increases, the support costs and the result are weighted.

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Russian-Ukraninian conflict and Armenia's food security risks

Key words: Russian-Ukrainian special operation, food, restrictions, self-sufficiency, supply, reserves, panic

Armenia is closely connected to the Russian market in terms of almost all impor-ted goods. Although not very close, we also have trade relations with Ukraine. In the structure of Armenia's foreign and mutual trade, the share of Russia in 2021 was 28% of exports and 37.2% of imports, and the share of Ukraine was 0.9 and 2.8%, respectively. In terms of food products, Armenia imports from Russia 99% of wheat, 80% of corn, 97% of vegetable oil, more than 70% of margarine, 40% of sugar, 15% of dry milk, 13% of poultry, and finally about 70% of non-essential products, chocolate. More than 34% of poultry meat, 25% of dry milk, about 15% of butter, about 60% of soybean and 20% of confectionery were imported from Ukraine to Armenia. More than half of the demand for dry milk is met by imports from Belarus. That is why the Russian-Ukrainian crisis is also a threat to Armenia's food security.

FORECASTING VIX INDEX AS A MEASURE OF MARKET VOLATILITY BY THE USE OF GOOGLE QUERIES

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Key words: Google Trends; Google searches; VIX Index; ARDL; volatility

Introduction. Understanding and predicting human behavior is of paramount importance. As the Internet penetration is constantly growing, users' Web-based search patterns are valuable for facilitating a better understanding of human behavior [1]. The study conducted by Jun et al. reveals that Google Trends, which has dramatically increased in popularity among researchers in the last decade, is used to analyze and forecast various variables in different areas, including IT, health, business and economics [2].

Traditionally, there has been a plethora of evidence that market agents are rather sensitive to the oil price changes. Rocketing or plunging of oil prices results certain volatility response in the market. The study carried out by Bastianin A., Manera M. suggests volatility responds significantly to oil price shocks caused by unexpected changes in aggregate and oil-specific demand, while the impact of supply-side shocks is negligible [3]. As per another study conducted by the same authors [4], the stock market volatility is not significantly affected by oil supply shocks, whereas it is very sensitive to oil demand shocks.

Scientific novelty. In this paper, we show that Google searches can help to forecast the CBOE Volatility (VIX) Index [5], a popular measure of the market's expected volatility on the S&P 500 Index [6], calculated and published by the Chicago Board Options Exchange (CBOE). VIX Index is considered as a leading indicator and should not be thought of as an immediate S&P 500 Index movement. Peter Carr substantiates that VIX can be considered as a fear gauge [7]. VIX Index is known to capture the market sentiment. In other words, it generally depicts the level of investor anxiety. In this paper we investigate if Google searches can also reveal investor anxiety, thus making Google queries a useful tool to understand the volatility movements. We hypothesize that oil-related Google queries, as a proxy of volatility expectations and/or anxiety of market agents, can be used to forecast VIX values. To the best of our knowledge, no study has been conducted to forecast VIX index by the use of Google queries related to oil so far. In this paper, we show the relationship between Google searches on oil and related terms and VIX Index. Furthermore, we try to forecast VIX Index based on the model under the study.

Literature Review. As the popularity of Google Trends is growing, scientific society are trying to utilize the data it provides to get more information on the financial markets. A study conducted by Callet, D. in 2013 [8] concludes that it is highly debatable if Google Trends contain enough information that is useful to predict financial markets. Contrary to this, in their paper Preis et al. [9] suggest that Google Trends contain information reflecting future trends of human behavior, thus it can have predictive power from financial markets' perspective. Using the historical data from 2004-2011, it is shown that before stock markets start falling usually there is an increase in Google search volumes for specific keywords relating to financial markets. This means that these warning signs in search volume data could have been exploited in the construction of profitable trading strategies.

Another study carried out by Ahmed et al. [10] claims a strong correlation between financial decision making and human behavior. To be more specific, the authors analyze and predict Karachi Stock Exchange 100 index considering the impact of the political and business events, and thus considering the corresponding Google searches. The results of the study indicate that the change in the searches of particular topics on Google may lead to stock market fall or rise. A study conducted by Habibah et al. [11] tries to answer several questions. First of all, it shows that there is a significant positive correlation between VIX and Google Indices as both of them can be considered as "sentiment" indices. Secondly, it compares both VIX and Google indices to check which one of the indices better captures the market pessimistic sentiments. Results suggest that change in VIX contains information that helps to forecast the Market Crash and Bear Market, and Google sentiment indices (Market crash and Bear market) also contain some information to explain the change in VIX.

Methodology. Autoregressive distributed lag (ARDL) modelling was applied to investigate the relationship between VIX index and oil queries on Google. To that end, weekly VIX Index (^VIX) values for the time period of 23.10.2016 - 27.12.2020 and the corresponding weekly oil searches on Google (search for the terms oil price, price of oil, and crude oil). It is worth noting that Google trends does not provide us with the absolute number of the queries, but rather with the relative numbers compared to the peak popularity of the term, which is the maximum number of searches for the given period, which is considered to be 100. We included the percentage change of relative oil searches in the model, which is equivalent to including the percentage change of oil searches in absolute numbers. Stationarity was tested with Augmented Dickey-Fuller Unit Root test [12,13]. The following candidate models were compared: all ARDL models with up to 3 lags for both regressor and the dependent variable, and also the model obtained by removing statistically non-significant lags from the best ARDL model. Akaike Information Criterion (AIC) [14] was used for model selection. Additionally, out-of-sample

static forecast was made with the best model for the period of 27.12.2020 – 17.10.2021.All inference was made at 5% significance level. Statistical computing was done with EViews 9.0 statistical package.

Analysis. *Model Estimation Results.* Table 1 illustrates that for both series we can reject the null hypothesis of having a unit root at 5% significance level.

Table 1. Augmented Dickey-Fuller test results

	p-value*
VIX	0.004
Oil searches: percentage change	<0.001
p-values were obtained from Augmented Dickey-Fuller test with maximum of 15 lags.	

The following candidate models were estimated:

Model 1: $VIX_t = 2.4 + 0.79VIX_{t-1} + 0.09VIX_{t-2} - 0.03VIX_{t-3} + 1.40IL_t + 3.290IL_{t-1} + 4.710IL_{t-2} - 0.550IL_{t-3}$

Model 2: $VIX_t = 2.31 + 0.86VIX_{t-1} + 1.20IL_t + 3.230IL_{t-1} + 4.440IL_{t-2}$

Model 3: $VIX_t = 2.22 + 0.87VIX_{t-1} + 2.970IL_{t-1} + 4.280IL_{t-2}$

Model estimation results for all candidate models are shown in Table 2 below:

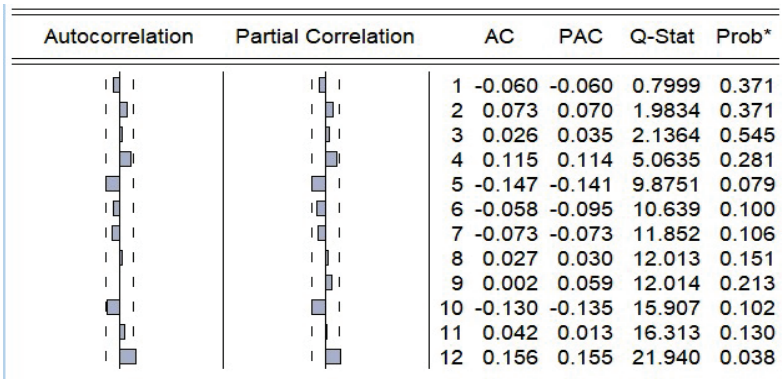
Table 2. Model Estimation Output.

Variable	**Model 1**	**Model 2**	**Model 3**
	p-value		
VIX_{t-1}	<0.001***	<0.001***	<0.001***
VIX_{t-2}	0.335	-	-
VIX_{t-3}	0.673	-	-
OIL_t	0.079	0.121	-
OIL_{t-1}	0.518	<0.001***	<0.001***
OIL_{t-2}	<0.001***	<0.001***	<0.001***
OIL_{t-3}	<0.001***	-	-
	AIC [1]		
	5.4803	5.4628	5.4649
[1] Akaike Information Criteria.			

As it can be seen from Table 2, the following model has the lowest AIC among all candidate models:

$$VIX_t = 2.31 + 0.86VIX_{t-1} + 1.20IL_t + 3.230IL_{t-1} + 4.440IL_{t-2}$$

We can infer from the equation that, on average, increase in the percentage change of oil searches in the given week and in up to the previous 2 weeks is associated the increase in VIX index. It is also worth displaying the autocorrelations and partial autocorrelations of the residuals for the selected model. Figure 1 below illustrates that the autocorrelation and partial autocorrelation coefficients up to the 12th lag are not significantly different from 0, thus residuals can be considered as serially non-correlated.



Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob*
		1	-0.060	-0.060	0.7999	0.371
		2	0.073	0.070	1.9834	0.371
		3	0.026	0.035	2.1364	0.545
		4	0.115	0.114	5.0635	0.281
		5	-0.147	-0.141	9.8751	0.079
		6	-0.058	-0.095	10.639	0.100
		7	-0.073	-0.073	11.852	0.106
		8	0.027	0.030	12.013	0.151
		9	0.002	0.059	12.014	0.213
		10	-0.130	-0.135	15.907	0.102
		11	0.042	0.013	16.313	0.130
		12	0.156	0.155	21.940	0.038

Figure 6. Correlogram of the residuals: Model with the lowest AIC.

* Probabilities may not be valid for the equation specification.

Note: It can be seen that none of the correlation coefficients (up to the 12th lag) is significantly outside the marked boundaries, which means none of the coefficients is significantly greater than 0 in absolute value.

Model Forecasting. The selected model was used to make an out-of-sample forecast for 27.12.2020 – 17.10.2021. Figure 2 illustrates the forecasted and actual graphs for VIX Index. In addition, Figure 3 illustrates the actual VIX values along with the forecasted values ± standard deviation.

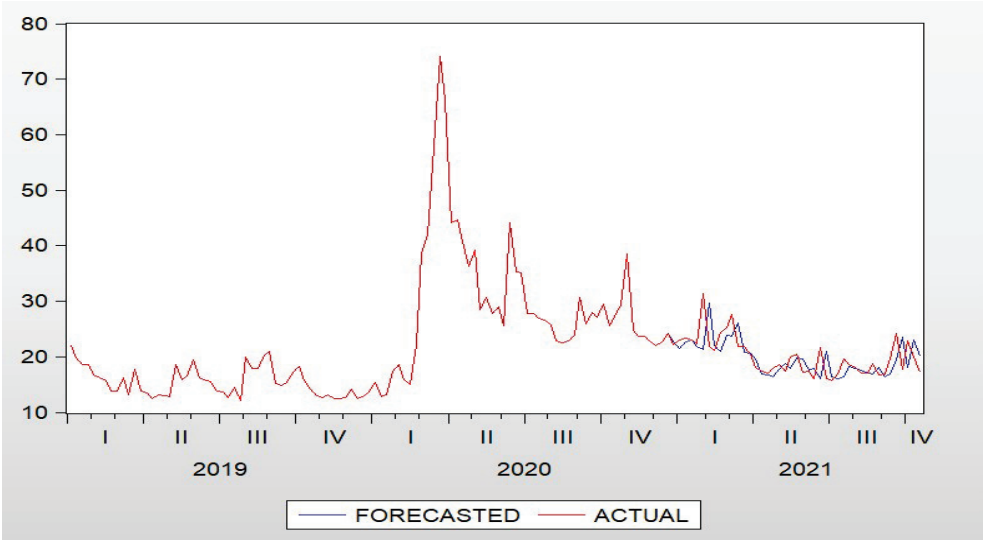


Figure 7. Actual and Forecasted VIX Values.

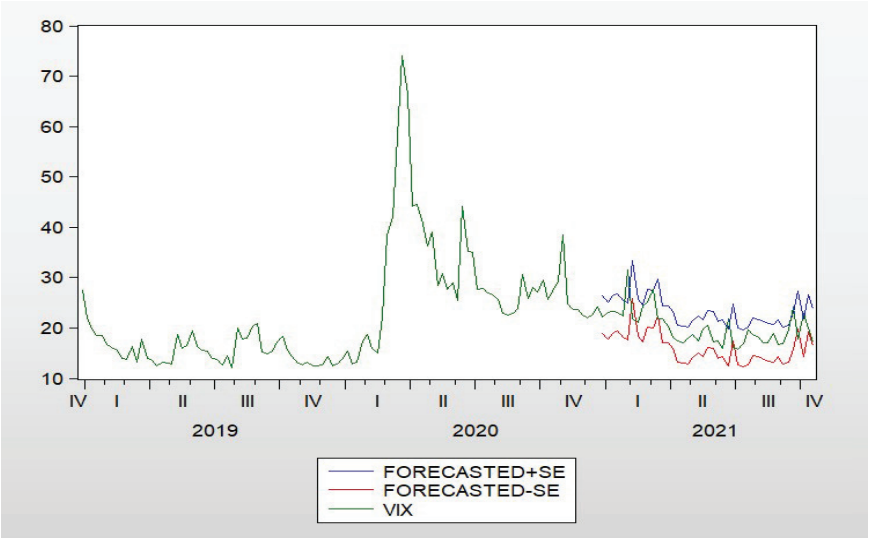


Figure 8. Actual VIX values with forecasted values +/- SE.

Conclusion. Regardless of the growing popularity of Google Trends data in the recent decade, we believe that it still has enough room to grow in popularity considering the potential predicitive power the data it provides might contain. Although several authors tried to answer various questions on the usage of Google Trends data in financial markets, to the best of our knowledge, there are no previous studies carried out to forecast VIX Index using the Google searches on oil and related terms. The results of the study are not only informative from the perspective of the question under the study in this paper, but also they might provide food for thought for other researchers to further investigate the topic.

The study results indicate that there is a statistically significant relationship between Google queries on oil and market volatility. To be more precise, percentage changes in oil searches in the given week, the previous week, and 2 weeks ago are associated with the volatility change measured by VIX Index in the same direction in the given week. This seems reasonable, since both factors reflect human behavior the same way. When people have either well-grounded expectations or worries related to the macroeconomic situation, they start with searching for more information on Google to understand the situation better and act to the best of their knowledge. Oil is considered to be some kind of indicator of how the economy behaves. On the other hand, once people fear, VIX also increases. To sum up, oil searches capture ether optimistic or pessimistic sentiment in the market, which in turn

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Forecasting VIX index as a measure of market volatility by the use of Google queries

Keywords: Google Trends; Google searches; VIX Index; ARDL; volatility

Modelling human behavior is rather challenging as imitating it with proxy variables is not straightforward. In recent years, search engines collect and provide us with a plethora of data, which might be a rather effective way of analyzing or forecasting human behavior. Although several authors tried to answer various questions on the usage of Google Trends data in financial markets, to the best of our knowledge, there are no previous studies carried out to forecast VIX Index using the Google searches on oil and related terms. In this paper we use Google searches on oil and related terms as a proxy variable for human expectations to model the CBOE Volatility Index. To that end, tradetional ARDL modelling was applied. The results indicate that there is statistically signify-cant relationship between Google queries on oil and market volatility. We explain this from the perspective of decision making since certain search activities on Google reveal the urge to show certain behavior and, on the other hand, the same behavior affects the market volatility.

POST WAR RECOVERY POLICY AND SUPPORT PROJECTS IN AGRICULTURE IN THE REPUBLIC OF ARTSAKH IN 2021

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Key words: agriculture, crop production, livestock, gross output, support programs

Introduction. The development of the agrarian sector is important for the development of the economy of the Republic of Artsakh. The main task of the development of agricultural production is to meet the demand of the economy for food and agricultural raw materials. In addition to a self-sufficient state, one of the priority tasks is to be able to export various agricultural products to foreign markets. The development of agriculture can have a significant impact on improving the macroeconomic situation in the country.Agriculture and village development is used all over the world, especially in our case, because rural development is a security issue for our country.According to the National Statistical Service of the Republic of Artsakh, the gross domestic product in 2019 amounted to 342.5 billion drams, and in 2020 - 270.9 billion drams. In 2019, the gross domestic product amounted to 70.6 billion drams, in 2020 - 56.5 billion drams, industrial production - 165.0 billion drams and 103.2 billion drams. Department of crop production in agricultural products in 2019 amounted to 30.7 billion drams, livestock - 39.8 billion drams, in 2020 these figures amounted to 22.2 billion drams - 34.2 billion drams. Studying the data presented in 2019 and 2020, it is not difficult to notice that in 2020 the gross domestic product (compared to 2019) decreased by 71.6 billion drams, which is conditioned by the 2020 epidemic, which reduced production, created problems in sales, as unleashed by Azerbaijan, the war on September 27, 2020. The share of agricultural products in GDP, respectively, the share of crop and livestock products has decreased. However, the development of the agricultural sector is a vital requirement, a source of survival. In 2021, the demand for many types of foods was met through imports. Taking into account the seriousness of the problems and challenges facing the country, the Government of the Republic of Artsakh has launched a number of support and development programs aimed at increasing the volume of crop and livestock products.

Methodology. We used methods of economic analysis, building statistic lines, conducting field research, particularly in the villages of Artsakh, as well as the method of comparative analysis and examined the economic indicators of growth in different

branches of the economy. Special attention is paid to the field of agriculture to reveal the capacity of Artsakh's economy to build and maintain proper level of food security.

Literature review. Considering the new realities and consequences after Azerbaijan's agression and the 44-day war in Artsakh, including thousands of lost lives, as well as ennormous material, technical, technological, financial and infrastrutral damages to the economy of the country, no academic research was conducted and no scholarly articles are published on mentioned topic. Therefore, the only sources of litrature and analytical data is taken from a number of sources of the Government of the Republic of Artsakh, including data from the National Statistical Service of the Republic of Artsakh, Ministry of Agriculture of the Republic of Artsakh.

Scientific novelty. Based on emerged post war circumstances, there is a vital need to design and use new approaches for economic development. In our study we emphasize the need of government involvement and state sponsored projects for speeding up the process of recovery and reconstructionof Artsakh's economy. From a food exporting coumtry Artsakh is compelled to turn into a food importing republic due to the loss of the majority of agricultural lands currently being controlled by Azerbaijan. Therefore, there is a need to partially compensate the losses by increasing the productivity of work and improving the efficiency of production in agriculture. Moreover, we suggest to take required steps to establish solid and reliable industrial grounds for agriculture. This part of scientific novelty is subject to continuous research for the years to come.

Analysis. The 2021 programs of the agricultural crop sector in the Republic of Artsakh were aimed at the development of horticulture, greenhouses, vegetables, perennial fodder crops, tobacco cultivation. In 2021 22287.4 hectares of autumn crops were sown in the Republic under the harvest, of which wheat - 10928.5 hectares, barley - 9801.8 hectares - beech - 1557.1 hectares. 18759.9 ha of sown area was actually harvested, the gross harvest was 12861.4 c / ha average yield. The low rates are largely due to delays in sowing due to the war and then to unfavorable climatic conditions. The following measures have been taken this year within the framework of the "Comprehensive Crop Development Program in the Republic of Artsakh".

1. 168 farmers from 31 communities of the republic benefited from the measure of providing free financial assistance to persons engaged in greenhouses. The total area of the greenhouses was 47,751 square meters, of which 20,831 were heated and 26,920 were unheated. The amount of assistance in the case of a heated greenhouse was 600 drams per 1 square meter, in the case of an unheated greenhouse - 300 drams.

2.198 farmers from 52 communities of the republic were the beneficiaries of the measure of providing free financial assistance to persons engaged in vegetable cultivation. The total area of sown areas was 410 hectares. The amount of support was 300

thousand drams per 1 hectare. It is noteworthy that the support was provided on the condition of cultivation of at least 0.25 ha.

3. In order to promote the development of horticulture, the cost of seedlings was partially subsidized in the amount of 1000 drams. Within the framework of the event, about 150 hectares of new orchards and berry orchards were established by 86 beneficiaries in 30 communities of the republic.

4. 27 beneficiaries received a surcharge of 20 drams per 1 kg for the sale of tobacco products. A total of 1131 tons of crop was procured from 158.6 hectares of tobacco fields.

5. For the cultivation of perennial fodder crops, 50 thousand drams were provided for financial support per 1 hectare. The beneficiary of the event was 74 land users, the sown areas of crops amounted to 278 hectares.

6. With the measure of providing free financial means to the persons building a new greenhouse, at least 100 sq.m. meters of area with a total area of 1 sq.m. 8000 drams per meter was provided, and the minimum was 500 sq.m. In case of establishing a greenhouse equipped with modern technologies with one complete area of 1,500 square meters, 22,000 drams per 1 meter support. The beneficiaries of the mentioned event were 82 applicants, by whom a total of 26441 square meters of new greenhouses were established, including 24079 square meters. meters in the traditional way and 2362 sq.m. modern.

In 2021 about 500,000 preventive injections were performed as part of anti-epidemic measures carried out by veterinarians in Artsakh. At the beginning of the year, cases of rabies, brucellosis, and flower epidemics were registered in the country. As a result of measures taken to prevent their spread, the epidemiological situation has stabilized in a short period of time. In the field of animal husbandry, several key programs have been implemented, aimed at compensating for the post-war losses, ensuring the growth of the livestock population, modernizing the methods of animal husbandry management, and improving the pastures. In the framework of the "Artificial insemination of agricultural animals" event, 310 heads of cattle and 100 heads of pigs were artificially inseminated. In order to improve the pedigree characteristics of the local livestock, in 2021 farmers were provided with 152 pedigree animals on preferential terms, including 10 pedigree bulls, 16 pedigree cows, 94 pedigree calves, 6 pedigree heifers, 26 pedigree pedigrees. Three agreements have been signed within the framework of the "Partial Subsidy Program for the Value of Imported Pets in the Republic of Artsakh". As a result, in 2021, 120 pedigree pregnant heifers were imported from Austria to Artsakh. As a result of the mentioned measures, as of December 1, a certain increase in the number of cattle was registered in the republic - 3.4%, including cows - 10.3%, pigs - 25.6%, small cattle - 11.7%, birds - 10.3%, bee colonies - 29%. With the help of the Hayastan All Armenian

Fund, the water supply system of a number of communities has been reconstructed, which will be a stimulus for the development of the relevant branches of agriculture.

Conclusion. Thus, the development of agriculture is crucial in the development of the economy of the Republic of Artsakh. This is the branch from which the socio-economic growth of the country derives - food security. In the post-war period, the state began to implement various support programs. A number of key projects have been launched in both the crop and livestock sectors, which will stimulate the development of the agricultural sector. It is difficult to reach the level we had before September 2020, but with a conscious attitude, significant success can be achieved.

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Post war recovery policy and support projects in agriculture in the Republic of Artsakh in 2021

Key words: agriculture, plant breeding, animal husbandry, gross output, support programs

The development of agriculture and villages is important all over the world, especially in our case, because for our country the development of villages solves the problem of state security. According to the National Statistical Service of the RA, in 2019 the gross domestic product amounted to 342.5 billion AMD, and in 2020 - 270.9 billion AMD. In the gross domestic product, the share of agricultural products in 2019 amounted to 70.6 billion AMD, and in 2020 - 56.5 billion AMD. The decrease is due to the pandemic and the war in 2020. One of the options for overcoming the post-war economic crisis is support programs, serious changes in the agricultural sector, which will contribute to the development of agriculture. Undoubtedly, the development of this sector of the economy is a vital requirement, a source of survival.In 2021, the demand for many food products in the Artsakh Republic was met through imports from Armenia. Taking into account the seriousness of the problems and challenges facing the country, the Government of the Republic of Artsakh has implemented a number of measures, support and development programs aimed at increasing the volume of crop and livestock products. The 2021 development programs of the crop sector were aimed at promoting horticulture, greenhouses, vegetables, perennial fodder crops, tobacco cultivation. Success has been achieved in the field of animal husbandry. In addition to support programs, serious attention is paid to infrastructure development. With the help of the Hayastan All Armenian Fund, the water supply system of a number of communities has been reconstructed, which would be a stimulus for the development of the relevant branches of agriculture.

REGIONAL ASPECTS OF UTILIZING ECONOMIC DIPLOMACY AIMED AT GRADUAL REDUCTION OF ECONOMIC THREATS

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Key words: economic diplomacy, economic security, regional integration, competitiveness, economic threats

Introduction. Expert community gradually admits the importance of assessing threats, however, economic security found different interpretations and preceptions worldwide. According to the analysis of research by some scientists, economic security is an ambiguous definition [Šimašius, 2005, 249-266]. The economic security of the state is considered as aspects that relate to the economic security of the majority of citizens of the state, and not individuals or their relatively small groups. There is a broader definition of economic security, according to which economic security is a priority element of modern national security, which can arise in any modern society due to the security of energy, transport, communications, army, food, etc., which cannot exist outside the national economy [Tamošiūnienė, 2015, 596 – 610]. Thus, economic security should be divided into two parts according to the approaches: individual and macroeconomic [Kremer-Matyskevic et al., 2019, 78-93]. The approach of individual economic security defines a person's economic security as stable if income and other sources are provided to maintain the standard of living in the present and near future, that is: constant solvency, predictable cash flow, efficient use of human capital [Kortunov, 2018]. The better the indicators of economic security, the more a person or household is protected from negative environmental factors - labor, health, loss of survivors, problems with purchasing power, the more they can count on - quality rest, comfortable living conditions, health insurance, increase in retirement fund. It is noteworthy that some experts analyze the sources of funding, the quality of life and the competitiveness of women of working age in the United States in the labor market, so the understanding of their economic security is greatly simplified and focuses on a person's ability to take care of himself / herself [Morris et al., 2013]

Scientific novelty. In our study we substantiate the need to develop and implement a targeted policy of economic diplomacy aimed at reducing and eliminating threats to economic security. The object of the research is the state and assessment of internal, regional and global threats and their impact on the economic growth of the newly independent states. Based on the main goal, we set the task of identifying various goals in foreign economic relations developed by the post-Soviet countries, as well as various approaches and goals in their regional integration. In this regard, the article analyzes global uncertainty and other risks, global trends and events affecting economic security.

Particular emphasis is placed on analyzing the prospects for the transition from a unipolar to a multipolar world, in which it is possible to combine national and global interests. In this regard, the impact of local, regional and global threats is considered from the point of view of common obstacles to the economic growth of post-Soviet countries. As practical recommendations, specific priorities of economic threats for their elimination and maintenance of economic security with the help of economic diplomacy are presented.

Methodology. In our study, we used statistical series, analyzed quantitative and qualitative indicators, such as GDP, GDP per capita, competitiveness, and others with the help of which the probability of converting risks into threats is determined by the method of determining threshold values by S.Yu. Glazev [Glazyev, 1997, 3-19]. Also, a method has been developed to classify the impact of local, regional and global threats on economic growth. In our study, the method of comparative analysis is widely used, in particular, the economic indicators of individual countries of the post-Soviet space. In turn, the method of comparative analysis allows us to identify some economic patterns that lead to a deterioration in quality indicators and their transformation into threats to economic security. Finally, methods to determine and study global uncertainties are of particular attention [Methodology, 2009].

Analysis. Economic trends and risks are also studied to compare the levels of vulnerability of states and find common points in national and global interests. To make our point more clear, we have examined the state of economic security in post-Soviet territory and discovered that economic diplomacy is rarely used to reduce existing risks and threats. As an important foormat for combining the efforts to fight threats EAEU and the project of the Greater Eurasian Partnership is mentioned in addition to other opportunities to better use economic diplomacy.

For a more realistic understanding of the different approaches and tasks of regional integration of the post-Soviet countries, one should not lose sight of the fact that created in the same 1997. with the union state of Russia - Belarus, the pronounced anti-Russian organization GUAM, which is now camouflaged in the Organization for Democracy and Economic Development, unites precisely those countries that, with rare exceptions, share the same interests and destinies: Georgia, Ukraine, Azerbaijan, Moldova (headquarters - Kiev, Ukraine).

Regional integration issues were also on the national agenda of the post-Soviet states. It is noteworthy that large global players could not ignore these trends, first of all, to build their strategic plans. Over time, some countries, given their geographic location, preferred an integrational orientation towards the West. And since this period coincided with new trends in Western Europe, in particular, with the signing and the beginning of

the implementation of the Maastricht Agreement [Treaty, 1992], the independent post-Soviet countries also did not bypass the possibility of European integration. And some countries - Moldova, Georgia, Ukraine made a special emphasis on the formation of appropriate prerequisites for future cooperation. In subsequent years, with the formation in 1995. World Trade Organization (WTO) on the basis of acting since 1948. Of the General Agreement on Tariffs and Trade, the new independent countries, one after another, began to apply for membership in this international organization following membership in the International Monetary Fund and the World Bank.

There is also one important feature of the participation of post-Soviet countries in regional integration. This is, first of all, the nature and content of the reforms after gaining independence. The slowness of 'shock therapy' had a significant impact on political and economic transformations. After a while, it became clear that there was a shock, but there was no expected therapy, while Chinese gradualism, for example, allowed a more balanced approach to the tools and methods of reforms, as well as to possible partners in regional integration. It is these features that can explain the desire of the new states to be present at once in different groupings and formats of regional integration. After all three Baltic countries - Estonia, Latvia and Lithuania left the Union earlier than others, the leaders of all the other 12 countries gathered in 1991 at the initiative of Russia. in Belarus and decided to form the Union of Independent States - CIS [CIS, 1991]. In the same year, a regional bloc called the Black Sea Economic Community (BSEC) was established at the initiative of Turkey. Common is the aspiration of both countries to form a regional organization and to influence the newly independent countries. However, there are much more features and differences. First of all, in the CIS, there are countries that have a certain experience of working together, are familiar with the goods and services of other countries, have left the single market, are comparable to the levels of socio-economic development, etc. As for the BSEC, this includes not only the post-Soviet countries, but also the countries of the European Union with absolutely incomparable levels of socio-economic development, including poverty and other indicators of threats to economic security. Moreover, the “formal” nature of the BSEC is also that some countries have no connection with the Black Sea. Finally, there are many countries that do not have diplomatic relations at all. An important role in regional disintegration is played by an organization with pronounced anti-Russian sentiments - GUAM (Georgia, Ukraine, Azerbaijan and Moldova).

In these conditions, the EAEU was born, within the framework of which attempts to coordinate and synchronize the national interests of the participating countries and with the goals and objectives of the Union do not cease. However, regional trends are significantly negatively affected not only by global uncertainty in general, but also by a variety of threats to economic security.

The experience of integration initiatives and processes in the post-Soviet space confirms the idea that in the years of independence these countries have and acquired more features than commonality and harmony for coordinating efforts within the framework of regional integration. Thus, effective, comprehensive and deep regional integration implies such structural components as the integration of political, economic and expert elites of countries participating in the integration processes, as well as structural factors, the creation or production of goods and services that have regional demand, the integration of structural factors, national markets. farms, primary and secondary institutions, investment integration, etc.

To measure economic uncertainty, an index of three types of main components is usually compiled. One component quantifies newspaper coverage of economic uncertainty associated with politics. The second component reflects the number of provisions of the tax code that will expire in the future. The third component uses discord among economic forecasters as an indicator of uncertainty.

Other risks include structural cracks, exacerbated by the crisis, which threaten to make the recovery highly uneven [Risks, 2021].

The expert opinion agrees that different standards in international economic relations, and sometimes their inconsistencies, cause great damage. The economic shockwave of the pandemic is a significant risk, not to mention the unprecedented health consequences. Threats to information security, information technology protection, as well as social problems have become aggravated in the world. Public health gaps, digital inequalities, educational inequalities and unemployment can undermine social cohesion. The deterioration of the social condition of women should be especially emphasized. Today, many working women are practically not sure what to expect tomorrow [Women, 2019]. There is also social fragmentation in society. Many citizens now know what kind of power political leaders can have when challenged and how a new political wave will turn out for society. During the period of pandemia, one should not forget about environmental threats: if humanity finds the keys to new diseases, then there is still no vaccine against environmental degradation.

The pandemic is also challenging the status quo and traditional thinking across all industries, but recognizing some of the trends mentioned above and taking timely action will help individuals and businesses gain an edge in the transforming post-Soviet space. An important role in this will also be played by the currently formed single pharmaceutical market of the EAEU, as well as growing ties with partner countries in the transforming world, which has a gradual tendency towards multipolarity.

There is clearly a deeper transformation in the global economic structure that has shaped anti-globalization narratives in industrialized countries that have spawned multi-

lateral agencies and the principles of multilateralism that drive globalization. Many countries also pioneered new technologies that propelled globalization forward and benefit most from it.

In this new geopolitics of new globalization, both post-Soviet and other countries and their companies will have to determine their own destiny. In particular, the old models of trade-based economic development, which were the historical model for developing countries, will have to be revisited. Digital technologies are changing the economies and business models of global companies; India, as a leader in information technology, will have to use it to its advantage. For example, trade in digital services is the fastest growing segment of global trade, even as merchandise trade stagnates. Could India, with its strengths in services and the big push for digitalization, become a digital services leader in the 21st century, with China as a manufacturing leader in the 20th century? Indian companies will have to rethink their global strategies. They will have to localize their operations and contribute to the development of the countries they belong to as they continue to globalize. The strategy of using low-cost operations outside India will be under pressure. They must recognize and cope with the uncertainty and turbulence inherent in this geopolitical transition and build more sustainable business models [Bhattacharya, 2018]. Ordinary citizens and decision makers should realize that globalization may hurt some groups and benefit the others, even when the players change over the time .

Thus, the world economy is going through difficult times of transformation, which only have a certain impact on the economic growth of post-Soviet countries, but also generate serious risks that eventually turn into threats to economic development. Therefore, it is necessary to deeply study, analyze and assess these threats, as well as develop appropriate strategies where the national interests of individual farms can be synchronized with regional interests or the interests of regional integration entities based on global tasks and interests.

Despite some isolation and lack of coordination of economic policies of individual countries, especially within the EAEU, many factors are turning into general threats to economic security. These are, first of all, such phenomena as: an increase in the volume of external debt, growing inequality between external debt and available foreign exchange reserves, low level of competitiveness of national economies, growth of the state budget deficit, "brain drain", population aging, etc.

Evidently, even clearly identifying common threats is not enough to eliminate them. There is a need for coordination of strategies and policies of the post-Soviet countries, as well as the development of conceptual provisions, a choice of approaches, effective tools and exchange of experience. In this process, it is difficult to overestimate the role of economic diplomacy and its more advanced methods.

Economic diplomacy, in our opinion, is designed to serve the progress of the country, ensuring its economic security and competitiveness. It is possible to analyze the processes of ensuring both economic security and increasing competitiveness in order to clarify the role and mission of economic diplomacy in them. In its most general sense, it is the level or ability of the state to reduce or eliminate existing threats. At the same time, in this case, there is a certain misunderstanding, both among the general public and among some experts. Some phenomena without a professional approach and assessment are classified as threats. For example, when it comes to public debt, many people rush to describe it as a threat. First of all, it is not only the size of the debt that is important, but also the efficiency of its management and servicing, which, in turn, becomes the goal of economic diplomacy. In our opinion, public debt management cannot be viewed in isolation from other economic phenomena. They are in close contact with each other, even by mutual agreement. Therefore, it is advisable to consider all the main economic indicators, more or less related to the questions posed. In particular, it is necessary to discuss the problems of institutional management of public debt, turn to indicators characterizing public debt, analyze the dynamically changing public debt market, as well as the effectiveness of debt consolidation and repayment mechanisms.

It is often difficult to assess the magnitude of the emergence of public debt as an economic threat. Therefore, the study of public debt management should be based on such a powerful concept as the size of the increase in public debt. In this sense, there is a more or less acceptable opinion among economists that it is not so much a matter of the absolute amount of public debt, but of its ratio to gross domestic product (GDP). On the contrary, there are many interpretations of what the debt-to-GDP ratio should be, beyond which it could become an economic threat.

Discussion. We believe that current research varies from other studies that concentrate on theoretical aspects of economic security and economic diplomacy exposing some of the historical underpinnings of the trade-conflict-cooperation link. The influence of globalisation and its implications for economic diplomacy and commercial policy are discussed as new players in the global game affect the game's rules [30] examining the issue of energy security or social security as special cases. This article is also different from our own findings, where economic threats are only some part of targets in economic diplomacy, attempting to establish a bridge from theory to real life [Manaseryan, 2017**,** 6-14]. Our analysis is focused on practical tools of reducing threats and tends to design keys for both local and regional levels economic security.

The results of our study are aimed at disclosing common threats to regional development and growth are studied, followed by justifying the need to design a common approach on how required level of economic security might be reached and maintained with joint efforts of regional allies. We use a systemic approach to prove our hypothesis,

particularly examining the case of post-soviet countries with their various goals in foreign economic relations and different approaches and goals of regional integration. This, in turn, is viewed as another threat by itself. In addition to local and regional factors, global uncertainty and other global risks are also analyzed with a careful consideration of global trends and events affecting economic security, as well asthe national and global interests. Our hypothesis is also justfied through keen examination of common nature of threats to the economic growth of post-Soviet countries. Since many threats have common nature, joint efforts are needed to design efficient tools for coordinated economic diplomacy for reducing and eliminating economic threats. Furthermore, EAEU format is presented as a proper framework to fight economic threats by utilizing the arsenal of economic diplomacy.

Conclusion. Thus, we have justified the need to develop and implement a targeted policy of economic diplomacy to fight economic threats, as well as assessed the environment and conditions where possible risks turn into local, regional and global threats. Also, our research team had identified various goals in foreign economic relations and different approaches and goals in regional integration of mentioned nations. In order to introduce the significance of foreign environment, uncertainty and other global risks and trends is disclosed with an emphasis of a long transition from a unipolar to a multipolar world. Contemporary tools and methods of economic diplomacy are outlined for utilizing them in a Greater Eurasian Partnership. Today the economic diplomacy of the post-Soviet countries should be aimed at ensuring not only political, but also economic security in the region, in particular, paying attention to common threats and opportunities for joint efforts to ensure energy, food, environmental and other forms of regional security. The geopolitical position of the region will be better used, in particular, to strengthen the strategic positions of the post-Soviet countries, especially with the Western countries, as well as to obtain foreign policy dividends in the context of the dynamic development of world economic ties.

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Tatul Manaseryan

Regional aspects of utilizing economic diplomacy aimed at gradual reduction of economic threats

Key words: economic diplomacy, economic security, regional integration, competitiveness, economic threats

We agree with a point that it is critical that companies ensure the high standards of safety of the main functional components to maintain an appropriate level of economic security. Scholars, studying the economic security of organizations, identify the following elements of economic security: finance, human resources, technology and innovation, political and legal environment, ecology, environment and information security. Finally, regional and global coercions and risks to economic security are taken into consideration in conjunction with the prospects of utilizing economic diplomacy to reduce and eliminate mentioned threats. In an attempt to find ways to overcome these threats, modern methods of economic diplomacy are highlighted, and the creation of a new regional grouping - the EAEU is assessed as a new format for combating economic threats, in particular, evaluating the concept of the Greater Eurasian Partnership as an important tool of economic diplomacy.