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ЕКОНОМИКА

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МЕЂУНАРОДНИ ЧАСОПИС
ЗА ЕКОНОМСКУ ТЕОРИЈУ И ПРАКСУ И ДРУШТВЕНА ПИТАЊА

ЕКОНОМИКА

Часопис излази четири пута годишње Година LXX, I-III 2024, број 1

ИЗДАВАЧ: Друштво економиста "Економика" Ниш
СУИЗДАВАЧИ: Институт за економику пољопривреде - Београд, Економски факултет у Суботици, Друштво економиста Ниша, Факултет за примењени менаџмент економију и финансије МЕФ - Београд

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2. Часопис су покренули Друштво економиста Ниша и Друштво инжињера и техничара Ниша (остало као издавач до краја 1964. године). Удружење књиговођа постаје издавач почев од броја 6-7/1958. године. Економски факултет у Нишу на основу своје одлуке броја 04-2021 од 26.12.1991. године постао је суиздавач "Економике". Такође и Економски факултет у ПриШтини постао је суиздавач од 1992. године. Почев од 1992. године суиздавач "Економике" је и Друштво за маркетинг региона Ниш. Као суиздавач "Економике" фигурирали су у току 1990-1996. године и Фонд за научни рад општине Ниш, Завод за просторно и урбанистичко планирање Ниш и Корпорација Винер Брокер Ниш.

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THE ROLE OF MANUFACTURING SECTOR TO ECONOMIC GROWTH IN NORTH MACEDONIA

Abstract

The main aim of the paper is to examine the performance of the manufacturing sector as a potential driver of economic growth in North Macedonia. The empirical research applies the comparative analysis of manufacturing sector performance, and growth sources sectoral approach for measuring the contribution of the manufacturing sector in the growth rate of GDP for the period 2002-2022. The results of the empirical analysis show a significant increase in the relative share of the manufacturing sector in GDP from 8.4% in 2002 to 13.1% in 2022 after the process of de-industrialization in the initial transition period. Additionally, the empirical analysis indicates a significant positive impact of the manufacturing sector on the economic growth of the country in the analyzed period. The country has slightly changed the unfavorable industrial structure by moving from clothing and garments to the automotive and machinery sector and it has recorded a significant improvement in the productivity level of the manufacturing sector measured by the gross added value per worker (from 3,026 US$ in 2002 to 14,464 US$ in 2022). However, these trends are still not enough to push forward the country's development process. Hence, the paper suggests that the policymakers should create a new approach based on industrial policy that will support modern re-industrialization by accelerating structural changes and by supporting new productive investments and technology transfer. This process is the best alternative for achieving sustainable economic growth of the country and a way for speeding up the convergence path toward the EU level of GDP per capita in the medium and long run.

Keywords: *Manufacturing sector, single regression analysis, sectoral approach growth accounting, North Macedonia*

JEL Classification: *O40, O14, O25.*

УЛОГА ПРОИЗВОДНОГ СЕКТОРА ЕКОНОМСКОМ РАСТУ У СЕВЕРНОЈ МАКЕДОНИЈИ

Апстракт

Главни циљ рада је да се испита учинак производног сектора као потенцијалног покретача економског раста у Северној Македонији. Емпиријско истраживање примењује упоредну анализу учинка производног

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сектора, и анализа извори раста секторски приступ за мерење доприноса производног сектора у стопи раста за период 2002-2022. Резултати емпиријске анализе показују значајно повећање релативног удела производног сектора у БДП са 8,4% у 2002 на 13,1% у 2022 години након процеса деиндустријализације у почетном прелазном периоду. Поред тога, емпиријска анализа указује на значајан позитиван утицај производног сектора на економски раст земље у анализираном периоду. Земља је незнатно променила неповољну индустријску структуру преласком са текстил и одеће на аутомобилски и машински сектор и забележила је значајно побољшање нивоа продуктивности производног сектора мереног бруто додатом вредношћу по раднику (са 3.026 УС $ у 2002. на 14.464 УС $ у 2022. години). Међутим , ти трендови још увек нису довољни да би се погурао развојни процес земље. Стога рад сугерише да би креатори политике требало да створе нови приступ заснован на индустријској политици која ће подржати модерну реиндустријализацију убрзавањем структурних промена и подршком новим продуктивним инвестицијама и трансферу технологије. Овај процес је најбоља алтернатива за остваривање одрживог економског раста земље и начин да се средњорочно и дугорочно убрза пут приближавања нивоу БДП по глави становника.

Кључне речи: *Производни сектор, јединствена регресивна анализа, рачуноводство раста сектора, Северна Македонија*

Introduction

Academic and scientific debate regarding the role and importance of the manufacturing sector for economic growth exists for a long time. Some older studies indicate that since the beginning of the industrial revolution, the manufacturing sector has had a key role in achieving long-term economic growth (Corwall, 1977; Kaldor, 1967). In fact, the success of Germany, Japan, and the United States after the Second World War is due precisely to the building of a strong processing sector. Very similar is the situation with the countries of East Asia in the aftermath of the 1960s that based the key to their impressive success on export-oriented industrialization.

The recent empirical literature confirms the validity of the thesis that manufacturing is a fundamental factor of growth. Namely, the results of these researches suggest that countries with a greater share of industry in GDP and employment noted more dynamic growth rates (Felipe, 1998; Tregenna, 2009). This correlation between the manufacturing sector and economic growth is even stronger in countries where the level of human capital is higher which indicates that modern industrialization is the key for more dynamic economic development. Additionally, the new industrial revolution based on the new technologies will significantly increase the productivity of the already existing industrial branches and will encourage the creation of new industrial branches and products with higher complexity and sophistication, which, as a final effect, will have a return to the dominant role of the industry in the new developmental economic models (Rodrik, 2014). Hence, the new industrial policy should be focused on increasing productivity level in the existing industrial branches and supporting new technology-intensive industrial branches (Réka et al., 2023).

Having in consideration that the manufacturing sector is important for economic growth, the main objective of the paper is to investigate the performance of the manufacturing sector and economic growth in North Macedonia. To fulfill this objective, we use several indicators including the added value of the manufacturing sector, the relative share of the manufacturing sector in GDP, the contribution of the manufacturing sector in economic growth, as well as, the level of productivity of each manufacturing subsectors. The empirical research is based on comparative analysis including benchmark countries from WB and SEE regions, growth sources sectoral approach, and single-country regression analysis to investigate the impact of manufacturing sector performance of economic growth for the period 2002-2022. North Macedonia as a post-transition country in the transition period towards a market-based economy has gone through the process of de-industrialization (decreasing the relative share of manufacturing in the GDP) without any significant improvements in the industrial structure. However, the FDI inflows in the last decade has slightly changed the unfavorable industrial structure and improved to some extent the industrial performance, but it is still not enough for pushing forward the country's development process.

The paper is structured as follows. In section 2, we briefly review existing empirical literature related to manufacturing sector and economic growth. The main empirical analysis including the explanation of the methodology, data, as well as the results and discussion, then appear in the section 3 and section 4, while the last section 5 presents our concluding remarks and some policy recommendations based on the empirical analysis.

Literature Review

The theoretical and empirical literature show that the manufacturing sector has an important role in economic growth (Rodrik, 2013b). Unlike the findings of the positive link between the manufacturing sector and growth, such a strong causal relation is not found between the service sector and growth (Szirmai and Vespagen, 2015). Even some studies of India, as a country that, largely based its growth on the service sector, showed that the processing sector remained an extremely important segment for the growth of the country (Kathuria and Raj, 2013; Ray, 2015).

There are more explanations why the manufacturing sector is so significant for economic growth. First, the manufacturing sector generates statically and dynamically growing economies of scale. Mass production enables per-unit product cost reduction, where specialization increases labor productivity which de facto leads to a more efficient allocation of resources (Rosenstein-Rodan, 1943; Kaldor, 1968). Exploiting the opportunities of economies of scale in the manufacturing sector exists even for small economies with limited domestic demand through the possibility of placing production on foreign markets. This kind of possibility is limited in most of the services, except for those that are subject to trade.

Second, the manufacturing sector provides opportunities for substantial capital accumulation. The manufacturing sector is much more capital-intensive compared to the agricultural and service sectors (Hoffman, 1958; Chenery et al., 1986; Szirmai, 2012).

Third, the fact that the manufacturing sector is capital-intensive indicates that precisely in this sector technological progress is the most significant. Namely, modern

production today is increasingly based on modern technology which simultaneously makes the industry R&D-intensive. This is also the case in some parts of the agriculture sector (biotechnology and bioengineering) and service sector (ICT), however, the application of new technology and R&D activities is most present in the manufacturing sector (Lapova and Szirmai, 2014).

Fourth, the manufacturing sector has a strong reproduction connection with other sectors of the economy through vertical ("backward" and "forward") and horizontal industrial links. Namely, the products in the processing industry are not sold only to the final consumers, but very often they are used in other sectors, thus creating complementarity and links between the various sectors in the economy. In this way, an opportunity is created for the exchange of knowledge and technology between the sectors and for generating external (multiplicative) effects from the economic activities of one sector, for the entire economy (Hirschman, 1958; Nurkse, 1953).

Fifth, the manufacturing sector has the largest advantages from the price and income elasticity. Namely, as income grows, the demand for industrial products increases, but at the same time, the demand for inputs that are needed to produce those products. If the country is not industrialized, it will face the need for greater import of industrial products that will lead to a deterioration of the balance of payments.

The new global trends have brought significant changes in the conditions, due to which existing models, which in the past provided significant convergence of developing countries towards highly developed economies, are no longer useful and functional. Namely, the manufacturing sector has become increasingly more capital-intensive with the dominant role of the newest modern technologies, which largely replace labor, and that reduces its power to absorb more workforce. Additionally, although global supply chains encourage the manufacturing sector, they give a very small opportunity to the countries that do not have many production capabilities to create local added value. All this led to a process of premature deindustrialization in developing countries and questioned the model of growth based on industrialization, through which most of today's developed countries have gained that status. (Rodrik, 2016; Palma, 2005). These new global conditions have prompted some economists to think that the manufacturing sector has lost its power and that in modern terms, the service sector will be the future engine and driving force of growth. However, such theses are naive and, largely, wrong, and, in addition, they could be supported by several arguments. Namely, there are at least three reasons why the service sector could not replace the processing industry as the basic driver of growth. First, those segments of the service sector that are subject to trading and which tend to rise in international trade are sectors that require highly skilled workers. In fact, banking, finance, and insurance, together with information, communication technologies, and business services, as services that are subject to trading, are characterized as highly productive service activities where real wages are quite high. However, these service activities are not available for a larger number of developing countries due to the fact that they are faced with high rate of low-skilled and insufficiently trained workforce that could not meet the requirements of these sectors. Therefore, these service activities in these countries could not absorb much of the supply of labor.

Hence, it could be concluded that in the service sector, there is a trade-off between absorption power for advanced technology and absorption power for the workforce. Namely, those services that are subject of trading (financial sector, information,

communications, and business services) had the opportunity for a continuous increase of productivity through the implementation of new technology, but on the other hand, because of their demands for highly skilled and trained workers, do not have the capacity to absorb higher rate of labor supply. On the other hand, services that are not subject to trading (wholesale and retail, administrative and auxiliary service activities) have the ability to absorb a higher rate of labor supply, but on the other hand do not possess a large capacity for technological improvements as a precondition for productivity growth (Rodrik, 2013a).

Second, most of the workforce in the service sector in developing countries today is located in services that are not subject to trading and in non-market services (public health, education, social work, public administration, and defense), and the activities in these sectors are characterized by a relatively lower level of productivity. Much less favorable is the fact that these services are facing serious obstacles in their growth and development, in those countries which have a small market and limited domestic demand. In fact, their productivity is largely determined by the productivity of the entire economy.

Third, today, it is less possible to make a difference between some types of services and the processing industry, such as companies in the manufacturing sector. Due to the greater specialization in primary production, a growing part of the services related to the production process are left to the service sector, thus creating production-related services (Manyika et al., 2012). These production-related services such as business services (accounting, legal, consulting, marketing and promotion, branding, and other services), transport services (internal and external transport, freight forwarding, storing, etc.), engineering services (designing, researching and developing of new products, maintaining and repairing) and other general services (security, maintenance of hygiene, food, etc.), absorb a significant part of the workforce and in the statistics are recorded as an added value in the service sector.

Practically, this is one of the reasons why in the past period a significant decrease in the added value of the manufacturing sector at the expense of the service sector was noticed, without taking into account that part of those services (production-related) were created by the processing industry and their potential for development is largely determined by the development of the processing sector.

All the above-elaborated reasons lead to the conclusion that it is very difficult to expect, especially in the case of small economies, that a service-led model of growth will be able to provide high and sustainable growth rates and new employments in a way that the model of growth based on the manufacturing sector has done it in the past (Rodrik, 2014). The above-mentioned arguments that the old growth models based on industrialization are no longer functional in the new global conditions (although in the past period this model has given exceptional results in many countries that through the process of industrialization accelerated the growth and significantly increased their GDP per capita) and the arguments that neither service-led growth can be the true alternative solution to the previous models, the question arises which is the right path to be followed by countries aspiring to intensify their growth in the coming period?

Perhaps the most valid answer to this question is the new structural economy. Namely, according to this theory, industrialization remains the most important factor for future growth, but the difference is that this approach pays much more attention to the industry and export structure (Lin and Monga, 2011; Lin and Chang, 2009; Lin

and Treichel, 2014). This theory shows that the productivity level of the manufacturing sector and the export structure are the main determinants of long-run economic growth (Hausmann et al., 2007; Felipe, 2013; Timmer et al., 2014a). There are many empirical evidence about the importance of export structure and export complexity for economic growth including for CEE countries (Lazarov and Petreski, 2023). Hence, the main recommendation for supporting long-run economic growth according to this theory is encouraging the process of modern re-industrialization by redirecting resources from industry branches with lower added value to sectors with higher productivity and export diversification by increasing the number of export products that are characterized by greater complexity and sophistication.

Research and Methodology

The empirical analysis of manufacturing sector performance is based on several indicators. One of the standard indicators for measuring the manufacturing sector's performance is the added value of the manufacturing sector and the relative share of the manufacturing sector in GDP.

A more important indicator for measuring the manufacturing sector performance is the level of productivity measured as the gross added value per worker in each manufacturing subsectors (food and drinks, chemicals and pharmaceutics, garments and cloths, leather plastic and rubber, wood and furniture, basic metals and fabricated metals, non-metal minerals, machinery, electro, automotive industry) according to the national classification of industrial branches.

We apply comparative analysis in order to examine the manufacturing sector performance in North Macedonia compared with other countries in the Western Balkan (WB) and broader South-East European (SEE) region measured by the relative share of the manufacturing sector in GDP in each country.

Additionally, we apply single-country regression analysis to investigate the influence of the manufacturing sector in stimulating long-run economic growth in North Macedonia for the period from 2002 to 2022, as a post-transition period.

$$GDPpc_t = \alpha_0 + \alpha_1 GDPpc_{t-1} + \alpha_2 M + \alpha_3 F + e_t \qquad (1)$$

where, $GDP_{pc\,t}$ is the logarithm of GDP per capita, $GDP_{pc\,t-1}$, is the logarithm of GDP per capita in the previous time period, M refers to the relative share of the manufacturing sector in GDP, while F represents the other growth determinants such as human capital, investments, FDI inflows, financial intermediation, and inflation rate.

Finally, we explore the contribution of the manufacturing sector to economic growth in North Macedonia and for that purpose we apply a sectoral approach of growth source estimation where we analyze the structure of the economy at the sectoral level and the contribution of each sector in the country's growth. The sectoral approach identifies the contribution of individual sectors (agriculture; manufacturing and non-manufacturing industrial sectors; as well as, the services sector including market and non-market services).

Below is the question for the sectoral-based approach of growth sources estimation:

$$g_Y = \sum r_i = \sum s_i g_i \quad (2)$$

where, g_Y is the growth rate of the economy, r_i , is the absolute contribution of the *i-th* sector to the GDP growth rate, g_i , refers to the growth rate of the *i-th* sector in the economy, while s_i , shows the relative share of each individual sector in GDP.

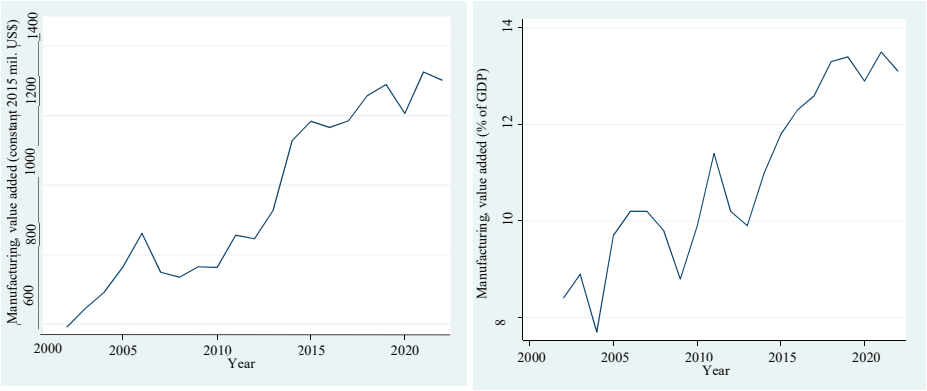
Findings and Discussions

the first part of the empirical research, we analyze the long-run trend of manufacturing performance measured by the added value of the manufacturing sector and the relative share of the GDP of the country in the period 2002-2022. North Macedonia has had an unsatisfied positive trend in manufacturing sector in the first part of the analyzed period (from 8.4% relative share of manufacturing sector in GDP in 2002 to 10.2% in 2012), while in the second part of the analyzed period it is recorded more significant positive trend of added value of manufacturing sector and increasing trend of relative share of manufacturing sector in GDP (from 10.2% relative share of manufacturing sector in GDP in 2022 to 13.1%).

This positive trend is largely due to the FDI inflows in the last decade which have slightly improved the manufacturing sector performance.

Below in Figure 1 are presented the trends of the gross added value of the manufacturing sector and the relative share of manufacturing in GDP.

Figure 1. *Panel A* - Gross added value of the manufacturing sector, (million US$) and *Panel B* – The relative share of the manufacturing sector in GDP (%) in North Macedonia



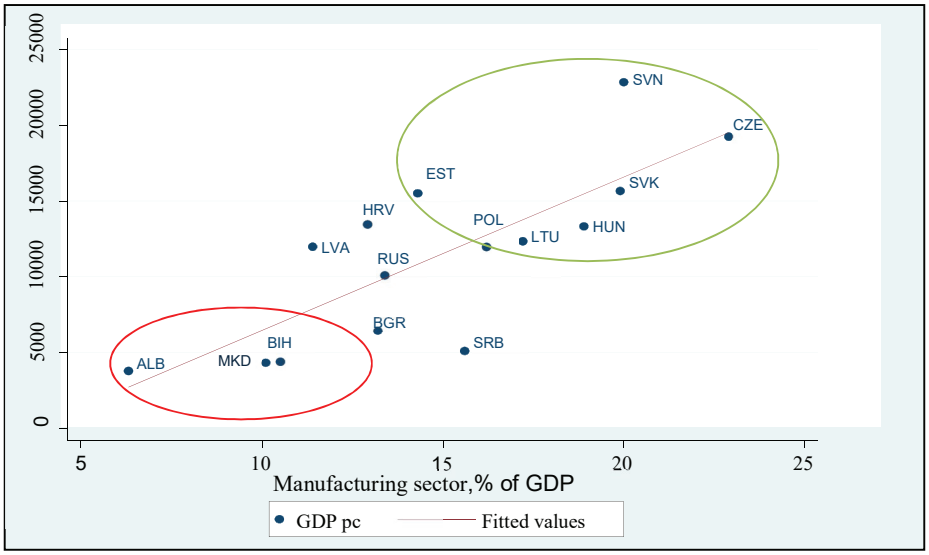
Source: Author's calculation based on the World Bank database

However, it is still not enough compared with the other more developed countries within the CEE region. For illustration, according to World Bank database the relative

share of the manufacturing sector in GDP in North Macedonia has reached level of 13.1%, which is below the EU average of 15%. This level is significantly higher in the more developed countries in the CEE region, such as Slovenia (19%), Slovakia (20%), Czech Republic (21%), Hungary (17%), and Poland (18%).

Figure 2 presents the relationship between the relative share of the manufacturing sector in GDP and the level of GDP per capita in selected CEE countries including North Macedonia.

Figure 2. Manufacturing sector (% of GDP) in CEE countries

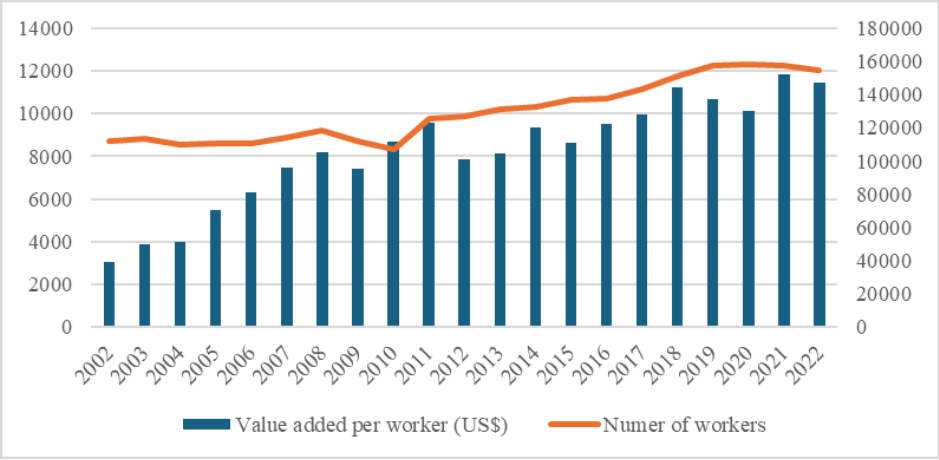


Source: Author's calculation based on the World Bank database

The comparative analysis shows strong significant correlation between the relative share of manufacturing sector in GDP and the level of GDP per capita. Actually, the more industrialized countries such as Slovenia, Slovakia, Hungary Poland, Estonia are in the same time more developed ones, and vice-versa, less industrialized countries such as Albania, Bosnia and Hercegovina, Bulgaria, North Macedonia and others have significantly lower level of GDP per capita.

The second part of the analysis of manufacturing sector performance refers to the number of employees in the manufacturing sector and the productivity level measured as added value per worker. The results show positive trends that are insufficient to change the unfavorable situation in the structure of employees within the country.

Figure 3. Productivity and employees in manufacturing sector in North Macedonia



Source: Author's calculation based on the World Bank database

Actually, despite the fact that the number of employees in the manufacturing sector in the analyzed period has increased for 34,187 new jobs (from 121,066 in 2002 to 155,253 in 2022), this growth in the number of workers in the manufacturing sector is significantly lower in relation to more than 180,000 newly created jobs in the service sector (especially in non-market services and services that are not subject of trading) for the same period.

The relatively small number of created new jobs in the manufacturing sector could not contribute to more significant structural changes in the national economy, especially given the fact that the large part of the labor force is still stuck in the agricultural sector (11.5%), construction (7%), and some branches in the service sector such as wholesale and retail trade with more than 15% (State Statistical Office of the Republic of North Macedonia). However, the level of productivity of the manufacturing sector (measured as added value per worker) in the analyzed period is significantly improved (from 3,026 US$ in 2002 to 14,464 US$ in 2022) which indicates that there are significant structural changes within the manufacturing sector. One of the main reasons for these significant improvements in the productivity level of the manufacturing sector is the FDI inflows predominantly in automotive and machinery sectors as high-added value sectors.

Below are presented the results of the analysis of manufacturing sector performance and structure in the period 2002-2022.

Table 1. Gross added value, productivity per worker and number of employees in individual industrial branches, 2002 and 2022

Sector	Relative share in manufacturing sector, %		Number of employees, %		Productivity level, US $	
	2002	2022	2002	2022	2002	2022
Clothing	15.4	4.5	26.2	22.1	2,301	6,408
Food sector	17.1	11.9	13.3	14.7	4,012	11,310

Fabricated metals	4.9	3.6	8.1	5.6	2,863	12,087
Metals	5.3	7.6	5.7	4.0	799	19,519
Leather sector	2.5	0.4	3.4	2.0	1,245	5,714
Tobacco products	7.0	4.1	4.0	2.1	5,440	18,099
Textile	2.8	3.5	4.5	6.7	1,731	11,087
Non-metallic minerals	6.0	3.6	5.5	2.2	3,164	34,544
Rubber and Plastic	3.7	2.6	4.4	3.1	3,040	14,010
Furniture	1.2	1.2	2.5	3.9	2,110	6,900
Electrical equipment	6.2	4.4	4.3	3.7	1,047	18,059
Drinks	6.2	3.6	2.0	2.2	19,775	29,570
Wood and paper industry	2.5	1.8	4.3	3.2	2,656	10,700
Machinery sector	0.6	29.8	1.3	1.8	969	53,549
Automotive industry	3.0	11.0	2.5	15.4	1,439	9,934
Chemical industry	1.4	1.0	0.9	0.7	9,444	29,320
Pharmacy	3.5	2.8	1.5	1.7	6,425	43,809

Source: Author's calculation based on State Statistical Office of the Republic of North Macedonia

The data presented in the Table above show that clothing has the highest drop of the relative share in manufacturing sector in the country (from 15.4% in 2002 to 4.5% in 2022), while the highest growth has been recorded in the machinery sector (from 0.6% in 2002 to 29.8% in 2022) and automotive sector (from 3% in 2002 to 11% in 2022).

Finally, we investigate the contribution of each individual sector in the growth rate of the country with specific focus on the contribution of manufacturing sector on economic growth. The results show that the services sector has the largest relative contribution to the rate of economic growth (72.5%), while the contribution of agricultural sector is 5.5% and the contribution of the whole industry is 22%.

The contribution of the manufacturing sector is 15.5%. The mining and energy sector has a negative contribution to the GDP growth (-4%), while the relative contribution of the construction sector is 10.5% indicating that this sector is still important for the Macedonian economy, compared with the agricultural sector which has a significantly lower contribution to the economic growth of the country (only 5.5%).

According to the estimated results, we could point out that the ICT sector has a significant contribution to economic growth of 13.2%. This sector is characterized as a sector with the high level of productivity and relatively high average wages.

The financial sector is also an important services sector with a relative contribution to GDP growth of 8.9%, while the largest relative contribution to economic growth have the wholesale and retail trade; transport and storage; accommodation facilities, and food service activities sectors (25.9%).

Table 2. Sector based approach of growth sources in North Macedonia

Sector	2002-2022			
	Growth rate, %	Relative share in GDP, %	Absolute contribution%	Relative contribution%
A. Agriculture, forestry and fisheries	1.3%	8.2%	0.2%	5.5%
B, C and D. Mining and quarrying; Electricity, gas, water, steam and air conditioning supply	-4.6%	3.3%	-0.1%	-4.0%
C. Manufacturing sector	4.3%	9.7%	0.4%	15.5%
F. Construction	4.7%	8%	0.3%	10.5%
E, H and Z. Wholesale and retail trade; repair of motor vehicles and motorcycles; Transport and storage; Accommodation facilities and food service activities	4.6%	17.1%	0.7%	25.9%
S. Information and communications	8.3%	5.1%	0.4%	13.2%
I. Financial and insurance activities	5.1%	5.4%	0.2%	8.9%
Other services sectors: J. Activities related to real estate; K and L. Professional, scientific and technical activities; Administrative and support service activities; Q, M and N. Public administration and defense; compulsory social security; Education; Activities of health and social care; W, O and P. Art, entertainment and recreation; Other service activities; Activities of households as employers; activities of households that produce various goods and perform various services for their own needs	1.8%	31%	0.5%	19.2%
Net taxes on products	2.1%	12.2%	0.2%	5.3%
Added value	2.9%	87.8%	2.6%	94.7%
Gross domestic product	2.8%	100%	2.8%	100%

Source: Author's calculation based on State Statistical Office of the Republic of North Macedonia

Finally, in the table below we present the estimated results of singly country regression analysis where we investigate the link between manufacturing sector performance and economic growth in North Macedonia for the period 2002-2022.

The estimated results indicate strong and statistically significant correlation between manufacturing sector performance measured by the growth of the added value of the manufacturing sector and the growth of real GDP. The regression coefficient is 0.191 and it is statistically significant at a 5% significance level. Additionally, the results show a positive correlation between investments (measured by the growth of gross fixed capital

formation), FDIs (measured by the growth of FDI inflows), human capital (measured by the human capital index), and growth of real GDP. However, the estimated results have not found any significant relation between inflation rate and economic growth.

Table 3. Manufacturing sector performance and economic growth

Dependent Variable*:* Real GDP **Variables:**	**(1)**	**(2)**	**(3)**
Real GDP (t-1)	0.431** (.000)	0.437** (.000)	0.573** (.000)
Manufacturing sector performance	0.191*** (.000)	0.190** (.000)	0.152** (.000)
Human capital	1.156** (.011)	1.122** (.011)	1.175** (.011)
Investments	0.137** (.000)	0.136** (.000)	0.089** (.000)
Inflation rate		0.000** (.705)	-0.001** (.419)
FDIs			0.013** (.000)
Adj-R^2	0.988	0.997	0.996
Note: ***statistical significance at the 1% level, **significance at the 5% level, *significance at the 10% level (in parenthesis are p-values).			

Source: Author's calculation

The specification tests that have been conducted after the estimations indicate that the models are well specified and the conclusions based on the estimated results are fully valid. The results of Ramsey's Regression Error Specification test show that the model is well specified, while Breusch-Pagan test shows that there is no heteroscedasticity

Conclusions

The paper explores the influence of manufacturing sector performance on economic growth in North Macedonia. North Macedonia has recorded a trend on industrialization after the transition period where the manufacturing sector has been destroyed. The FDI inflows in the last two decades have had a positive impact on increasing the relative share of the manufacturing sector in GDP and improving the productivity level of this sector by changing the unfavorable industrial structure. The country has slightly changed the unfavorable industrial structure by moving from textile and garments to the automotive and machinery sector and it has recorded a significant improvement in the productivity level of the manufacturing sector measured as gross added value per worker (from 3,026 US$ in 2002 to 14,464 US$ in 2022). These improvements in the manufacturing sector's performance have had a positive impact on the economic growth in North Macedonia.

The empirical research applies the comparative analysis of manufacturing sector performance including benchmark countries from WB and SEE region, growth sources sectoral approach for measuring the contribution of the manufacturing sector in the

growth rate of the country, as well single-country regression analysis to investigate the impact of manufacturing sector performance of economic growth for the period 2002-2022.

The results show a significant increase in the relative share of the manufacturing sector in GDP from 8.4% in 2002 to 13.1% in 2022. However, it is still not enough compared with the other more developed countries within the CEE region. For illustration, according to the World Bank database, the relative share of the manufacturing sector in the EU is 15%, while it is significantly higher in the more developed countries in the CEE region such as Slovenia (19%), Slovakia (20%), Czech Republic (21%), Hungary (17%), Poland (18%).

The results based on the sectoral approach of growth sources analysis indicate a significant contribution of the manufacturing sector to the GDP growth in the analyzed period in North Macedonia. Actually, the relative contribution of the manufacturing sector in the rate of economic growth in the analyzed period is 15.5% ranking this sector as the second largest sector in terms of contribution in GDP growth after the wholesale and retail trade sector. Additionally, the estimated results of the single-country regression analysis show a strong positive and statistically significant relationship between the manufacturing sector and economic growth. The regression coefficient is 0.191 and it is statistically significant at a 5% significance level. Additionally, the estimated results show a positive impact of investments (measured by the growth of gross fixed capital formation), FDIs (measured by the growth of FDI inflows), and human capital (measured by the human capital index) on the growth of real GDP. However, the estimated results have not found any significant impact of the inflation rate on economic growth.

Finally, the paper gives some suggestions to policymakers to put more effort into the process of modern re-industrialization by accelerating the structural changes and supporting the new productive investments and technology transfer. This process is the best alternative for achieving sustainable economic growth in the country and speeding up the convergence toward the EU level of GDP per capita in the medium and long run.

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THE IMPACT OF CREDIT INDEBTEDNESS OF NATURAL PERSONS ON INDIVIDUAL CONSUMPTION OF HOUSEHOLDS

Abstract

In the period 2008-2019, we notice that the available funds-income that households generate are not sufficient to cover the individual consumption of the household, so the question arises how natural persons in Serbia compensate for this shortcoming. On the other hand, there is a significant increase in banks' lending activity in lending to natural persons in the same period. The aim of this paper is to examine the possible connection between the increase in credit indebtedness of natural persons and individual consumption of households. The basis for the analysis is the data of the NBS and SORS. The importance of the research is reflected in the fact that the analysis of individual consumption and credit indebtedness of natural persons is a very important topic that determines the living standard of the population. Banks' receivables from natural persons based on non-residential loans, namely cash, consumer and current account overdrafts, were analyzed, because they can be the basis for individual consumption. The results of the analysis showed that there is a high correlation between the increase in credit indebtedness of natural persons and individual consumption of households, and that households in Serbia certainly use part of the loan to cover individual consumption, because available household resources are not enough. Natural persons in the analyzed period compensate for their insufficient solvency with increased credit indebtedness.

Key words: *loans to natural persons, individual consumption of households, household income*

JEL classification: *D 14, E 21, G 50*

УТИЦАЈ КРЕДИТНЕ ЗАДУЖЕНОСТИ ФИЗИЧКИХ ЛИЦА НА ЛИЧНУ ПОТРОШЊУ ДОМАЋИНСТАВА

Апстракт

У периоду 2008-2019. године, уочавамо да расположива средства-приходи које домаћинства остварују, нису довољна за подмирење личне потрошње домаћинства, па се поставља питање на који начин физичка лица у Србији надокнађују овај недостатак. Са друге стране уочава се значајан раст кредитне активности банака у кредитирању физичких лица у истом периоду. Циљ рада је испитивање евентуалне повезаности повећања кредитне задужености

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физичких лица и личне потрошње домаћинстава. Основа за анализу су подаци НБС и РЗС. Значај истраживања огледа се у чињеници да анализа личне потрошње и кредитне задужености физичких лица представља врло важну тему која детерминише животни стандард становништва. Анализирана су потраживања банака од физичких лица по основу нестамбених кредита, и то готовинских, потрошачких и дозвољеног прекорачења по текућем рачуну, јер они могу бити основ за личну потрошњу. Резултати анализе су показали да постоји висока корелација између повећања кредитних задужења физичких лица и личне потрошње домаћинства, и да домаћинства у Србији свакако део кредитних средства користе и за подмирење личне потрошње, јер расположива средства домаћинстава нису довољна. Физичка лица у анализираном периоду, недовољну платежну способност надомешћују повећаним кредитним задужењем.

Кључне речи: *кредити физичких лица, лична потрошња домаћинства, приходи домаћинства*

Introduction

The analysis of personal and family finances is gaining more and more importance in the modern economic environment. There are great challenges that natural persons face in managing personal finances in economic systems that have gone through a period of transition, the transformation of the banking sector and then the global economic crisis. Serbia is among the last countries in the region which, due to the complex socio-economic circumstances of the last decades, started the process of economic transformation, and when the banking market stabilized, a period of world economic crisis occurred, the consequences of which had to be felt in our region.

The topic of individual consumption analysis has a broader socio-economic significance. The indicator of individual consumption of the household is a topic that is a significant indicator of the economic development of the national economy, and the trend of its movement shows the real financial and economic strength of the population. According to the Survey of the Statistical Office of the Republic of Serbia for 2019, the structure of individual consumption is dominated by expenditures for food and beverages (34.2%), followed by expenditures for housing and utilities (16.7%), transport (9.3%), for clothing and footwear (5.3%), communications (5.3%), recreation and culture (5.1%) and others (SORS, 2020). In the structure of individual consumption, as can be seen, necessary consumption dominates. Such a pattern of consumption behavior, as well as the fact that average expenditures are higher than the official average household income, indicates the illiquidity of the average household, which must be settled from certain sources. In economic theory and practice, the inability to settle liabilities in the short term is compensated by borrowed resources. It is to be expected that these sources are credit sources, more precisely different forms of credit indebtedness, i.e. different types of loans to natural persons, which can also be used for individual consumption.

The banking sector has undergone a significant transformation in the last twenty years, because many significant regional banking groups have come to Serbia, through the takeover of domestic banks. With the arrival of these banks, the banking sector and its

supply have improved significantly. Among others, the retail lending sector has undergone significant transformations. The household sector is recognized as a profitable sector for many commercial banks. Households are less sensitive to changes in interest rates than, for example. companies. Credit products of natural persons are adjusted to the needs of the population. Banks design and present products that are tailored to different users. By placing one type of loan, the possibility for placing other loan products opens up. By lending, banks in a certain way strengthen financial ties with households in deposit operations as well, which is important for the financial potential of banks, i.e. cheap sources of financing (Ćirković, 2006).

The paper analyzes the credit products of banks that can be considered as a source of household consumption. These are: cash loans, consumer loans and allowed overdrafts on the current account. Cash and consumer loans are loans that can be both short-term and long-term, while maturities of up to two years are allowed. As a rule, these loans require more affordable collateral, so they are very common. By their nature, these loans can also be the subject of individual consumption, especially cash loans and allowed overdrafts because they are non-purpose sources of financing. The aim of this paper is to determine the interdependence of lending to natural persons and individual consumption of households.

The basic hypothesis in the paper is the claim that individual consumption of households in Serbia is influenced by credit indebtedness of natural persons for certain types of loans and that increasing credit indebtedness of natural persons, i.e. households, increases individual consumption and compensates for the lack of average household funds to cover individual consumption. Natural persons, i.e. households, compensate for insufficient available funds for individual consumption with higher credit indebtedness. Certainly, there are other factors that determine individual consumption, which can be the subject of special analysis (for example, remittances from abroad, etc.), which makes this topic significant and this paper a good basis for future research.

The socio-economic significance of the topic is reflected in the fact that the topic of living standard, indebtedness and individual consumption of natural persons and households, especially in the period after the economic crisis, is of great importance not only in economic but also in the wider social sense.

The structure of this paper consists of five segments. After the introductory part and the presentation of the theoretical background, the collected data were presented, followed by the research results and the analysis of the obtained results. At the end, concluding considerations were presented.

Literature review

The interdependence of credit indebtedness of natural persons and household consumption is a topic of great theoretical and practical importance. There are sources in the literature that deal with the analysis of different impacts on the consumption of household members. For the period after the world economic crisis, after 2008, no similar analysis was done in Serbia, which emphasizes the interdependence of credit indebtedness of natural persons (non-residential type) and individual consumption of households. There are separate sources in the literature that deal with the analysis of retail lending, and that deal separately with the analysis of consumption and household income.

In the period of economic crisis and post-crisis period, households generally reduce the consumption of all items, rent food, postpone consumption in the purchase of clothing, footwear, durable consumer goods, even reduce health expenditures, spend savings, or borrow money from relatives and friends (Stošić et al., 2012). When it comes to the first decade of the 21st century, the consumer basket was covered by available household funds 1.4 times, while in 2013, only ten years later, that coverage was 0.86 (Zlatanović, 2015). In periods of recession, households are characterized by certain common behavioural characteristics such as a decrease in the consumption of certain goods and services but also an increase in savings (Crossley et al., 2013).

Some studies have shown that income inequality is present in Serbia, and observed according to sources, inequalities are mostly contributed to by earnings, while other sources contribute less, and income inequality is more pronounced in Serbia than in other EU countries (Arandarenko et al., 2017). There are also views of authors who believe that when it comes to borrowing policy and social inequalities in Serbia, due to the dominance of the neoliberal concept of development, borrowed funds are invested more in consumption than in the production of goods, knowledge and services (Novakovic, 2019). Poverty has a significant impact on household consumption statistics in Serbia. Only in the period 2013-2014. year, the poverty rate in Serbia increased from 8.6 to 8.9%, which means that in 2014, 620,000 inhabitants were considered poor, which is not a small percentage (Mijatović, 2015).

The economic crisis from 2009 to 2013 caused stagnation or a decline in social product, income and employment, which resulted in a decline in living standards and rising poverty in Serbia (Krstić, 2014).

The problem of over-indebtedness of natural persons is a topic of importance in Croatia as well. According to Bejaković (2010), over-indebted persons are doomed to a poor quality of life and the necessity of debt management is pointed out. The purpose of debt management can be economic, which implies economic recovery and stability, social, which means avoiding social consequences due to over-indebtedness, and regulatory, which implies the existence of out-of-court mechanisms to assist natural persons in debt management.

In Bosnia and Herzegovina, an analysis of the sustainability of changes in expenditure on food and non-alcoholic beverages due to changes in income was made, and the results are that these expenditures are inelastic in relation to income ($E < 1$), and that income is a key determinant of consumption (Dacić & Hanić, 2019). A similar analysis was performed in Serbia, which through the results of econometric evaluation of Engel curves showed the significance of income as a key determinant of consumption (Hanić & Bugarčić, 2019).

There are sources that link indebtedness and personal bankruptcy. In the US, expenditures on durable consumer goods significantly increase bankruptcy claims, while unemployment has a marginal effect (Zhu, 2011). This is understandable given the development of the American labour market and unemployment.

The credit activity of natural persons is determined by creditworthiness. The analysis of the creditworthiness of the borrower implies an assessment of: the characteristics of the borrower, the ability to pay, assets, loan security, but also the credit history (Hadžić, 2018). For the increase in credit indebtedness of natural persons, creditworthiness, credit history, but also the lack of adequate credit security, can be a significant limiting factor. Some banks use different scoring models to assess creditworthiness. These models are based on previous data of the characteristics of credit users, but certainly require a periodic review of factors that affect scoring, first of all the amount of income (Steenackers and Goovaerts, 1989).

Banks basically consider credit risk, which determines the conditions for loan approval. Credit risk is defined as the risk of default based on credit obligations by debtors (Đukić, 2003). Regulations of the National Bank of Serbia in controlling the work of banks and the protection of users of financial services resulted in the entry into force of laws and bylaws that regulate this area. The Law on Protection of Users of Financial Services, in essence, allows loan users, natural persons, a clear and transparent presentation of credit products in terms of all essential elements of credit (Official Gazette of RS, 2014). In addition to this regulation, there is a Decision on the conditions and manner of calculating the effective interest rate (Official Gazette of RS, 2018), according to which banks are obliged to indicate the real-effective interest rate, which includes non-interest loan costs. Both regulations significantly determine the relationship between natural persons and financial institutions. Better understanding of credit products for natural persons reduces the possibility of households getting into a difficult financial situation or even financial bankruptcy, which further certainly affects the individual consumption and standard of living of the population.

Data analysis

The data used in the analysis are official data published by the National Bank of Serbia (NBS) and the Statistical Office of the Republic of Serbia (SORS). NBS data represent indicators of banks' claims on loans to natural persons by different types of loans. The data are published by the NBS monthly, and the data presented represent the claims of the banking sector in December, for each presented year. In order to obtain the amount of bank claims for loans that may have an impact on individual consumption, claims on housing loans as well as claims on interest and fees were deducted from total bank claims. Banks' claims for interest and fees affect disposable income, but the aim of this paper is to examine the effect of lending on individual consumption, so we exclude them. Housing loans are also presented, in order to gain insight into the trends of this type of loan in relation to other types of loans to natural persons, which gives additional useful conclusions.

Data on individual consumption of households as well as data on available funds are taken from the website of the Statistical Office of the Republic of Serbia, for each year separately. According to the SORS, the average number of household members in 2019 is 2.86 members (on a sample of 2,464 households). Individual consumption statistically includes consumption for food and non-alcoholic beverages, housing and overhead costs, transport costs, personal items, clothing and footwear, communications, recreation, culture, etc. The available funds - household income are: income from employment, pensions, income from agricultural activities, income from employment, social income and income in kind (which represent the value of products produced and consumed by the household and costs covered by the employer). The survey on household consumption by the Republic Bureau of Statistics was not conducted for 2020 because it was impossible to conduct the survey due to the Covid 19 pandemic.

The table below presents all the described and previously mentioned data, in millions of dinars, for the period of twelve years (2008-2019), from the period of economic crisis to 2019:

Table 1 Loans to natural persons, individual consumption and available household funds 2008-2019.

Year (December)	Total claims of the banking sector on natural persons (excluding interest, fees ...)	Banking sector claims on housing loans	Bank claims for loans to natural persons (cash, consumer, current account overdraft.)	Individual consumption of households	Available funds - household income (in total)
	A (000.000 RSD)	B (000.000 RSD)	A-B (000.000 RSD)		
2008.	347.216	163.051	184.165	40.100	43.518
2009.	376.128	191.482	184.646	42.548	47.639
2010.	483.631	256.159	227.472	42.448	47.376
2011.	516.021	275.784	240.237	47.574	51.641
2012.	559.877	309.473	250.404	56.543	51.504
2013.	582.237	314.869	267.368	56.013	56.073
2014.	635.045	336.645	298.400	58.713	57.054
2015.	669.432	346.199	323.233	59.052	57.814
2016.	739.334	359.495	379.839	60.720	59.624
2017.	800.140	355.483	444.657	62.275	61.407
2018.	900.412	383.364	517.048	64.481	63.734
2019.	986.209	399.974	586.235	67.099	66.880

Source: NBS and SORS

The methods of analysis in this paper are the statistical method of correlation, the comparative method, the method of induction and deduction, and the historical method.

The analysis seeks to determine whether there is an interdependence of credit indebtedness of natural persons with individual consumption, the intensity of this interdependence and whether this correlation is positive or negative. Although data are also available for housing loans by year, the possible interdependence of the growth of these loans and, for example, individual consumption or available household funds will not be analyzed, because the population of housing loan users is far smaller, but this may be the subject of another analysis.

Research results and Discussion

The analysis of the collected data shows that the total claims for loans to natural persons (excluding interest and fees) in the period from 2008 to 2019 increased significantly, more precisely by 184%. In each of the twelve analyzed years, a continuous growth of these claims is noticeable, which leads to the conclusion that the population in Serbia in the post-crisis period was significantly indebted.

Housing loans, which increased by as much as 145.3% in the same period, also contributed to this growth in the indebtedness of natural persons over a period of 12 years. Bearing in mind that housing loans are loans with a rather long repayment period, the

assumption is that the banks' portfolio has only increased. Housing loans are approved for up to 30 years, which leads to the conclusion that in addition to the repayment of existing loans, newly approved housing loans also cancel the amounts that are returned and increase the total claims of banks for housing loans, increasing the total portfolio of housing loans in Serbia. It can be concluded that in the mentioned period, housing loans had a significant growth, except for 2016/2017.

In the analysis in this paper, we exclude claims for housing loans from the total claims of the banking sector, without interest and fees. If we analyze the trend of total claims on non-housing loans without interest and fees, we conclude that banks' claims for cash and consumer loans and allowed overdrafts in the period from the beginning of the economic crisis in 2008 to 2019 increased by as much as 218, 4%. It should be borne in mind that these are loans with a maturity that is certainly shorter than the period analyzed in this paper, and that significant amounts were both placed and returned to banks in that period. This leads to the conclusion that the banking sector in Serbia, we can freely say, has lent intensively to natural persons precisely in those types of loans that can have a basis or can encourage individual consumption. It can be seen that this growth is pronounced in the last three years of the analyzed period. In 2016/2017, the growth was 17% (even when a decline in housing loans was recorded), while in the next two years the growth was 16.4% and 13.3% compared to the previous year.

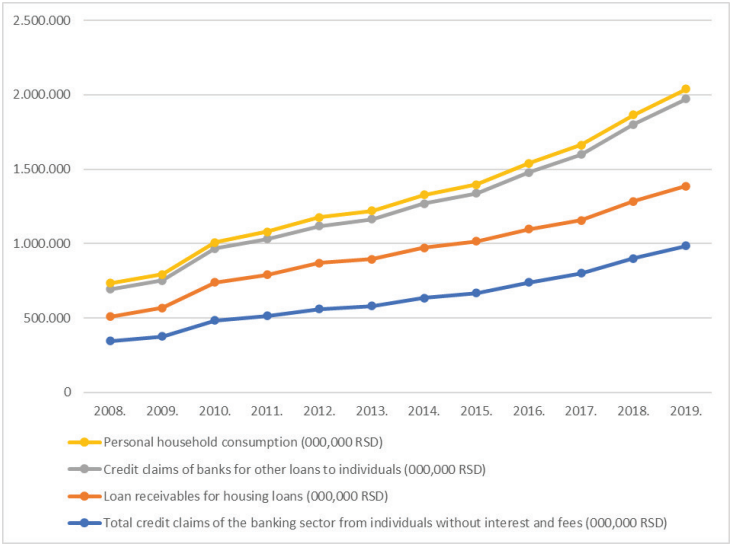
According to the analysis of data on individual consumption of households, in the period 2008-2019 individual consumption increased by 67.3%, with a slight stagnation in 2010 and 2013, since in the previous 2012 the growth of individual consumption was 18, 85% compared to 2011. In that year, the growth of individual consumption of households was the most pronounced. In the years that followed, the annual growth of individual consumption of households was below 5% per year, compared to the previous year.

Finally, there is a very similar trend in individual consumption and credit claims of banks for cash and consumer loans and allowed overdrafts, which indicates the need to examine whether there is a correlation between individual consumption and bank claims for non-residential loans, more precisely for loans that can be used for individual consumption as well.

Applying Pearson's correlation coefficient for data on bank claims for the above types of loans to natural persons and data on individual consumption of households, we find that the correlation coefficient $r = 0.869$, and the determination coefficient $r^2 = 75.46\%$. It can be concluded that there is a high positive correlation between the indebtedness of natural persons for non-housing loans and the individual consumption of households. This means that natural persons use the funds of cash and consumer loans, as well as the funds of the allowed overdraft on the current account (allowed minus) to settle individual consumption as well.

Given the also high coefficient of determination of 75.46%, we conclude that changes in credit indebtedness of natural persons significantly affect individual consumption. Of course, this influence is not the only factor, there are certainly other factors as well. The alienation coefficient $k^2 = 24.54\%$, certainly indicates that the influence of other factors is not negligible, and the analysis of the influence of other factors may be the subject of some future research.The chart below shows the trends in banks' claims for non-housing loans and trends in individual consumption for the period from 2008 to 2019.

Chart 1 The curve of individual consumption of households and the curve of credit claims of banks from natural persons in Serbia in the period 2008-19. in millions of RSD



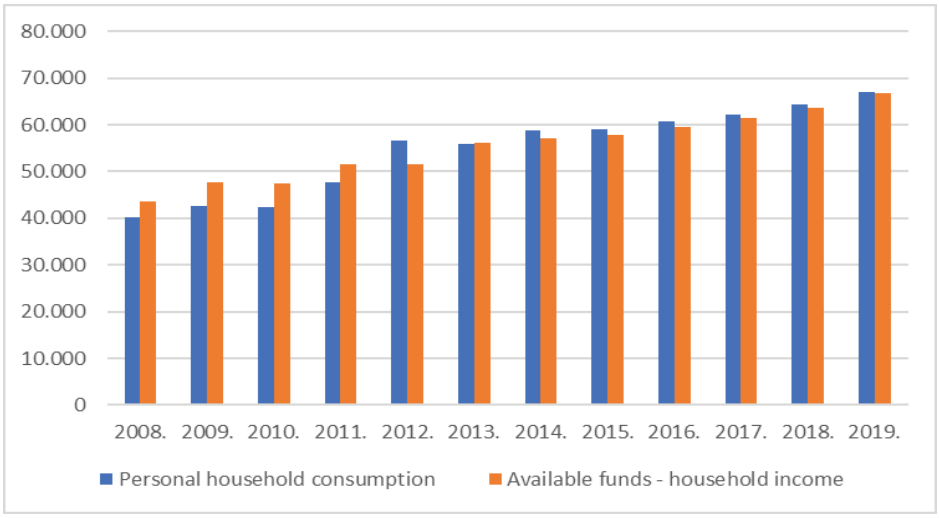
Source: NBS and SORS

The previous chart shows an interesting trend in the banking sector's claims on natural persons for housing loans, and it can be concluded that due to the increase in indebtedness of natural persons with housing loans, there is an increase in individual consumption. However, the analysis and measurement of the interdependence of the possible impact of this group of loans may be the subject of a separate analysis. It should be borne in mind that the number of users of housing loans in Serbia is significantly lower than the users of other loans to natural persons that we analyze in this paper.

Also, we can talk about the reversible impact of individual consumption on credit indebtedness. Restrictions on individual consumption expenditures certainly determine the real DTI ratio of indebtedness of natural persons. If the average household in the analysis, according to the SBS data in 2019, has 2.8 members, the structure and employment of family members are of crucial importance. So, whether two are employed or two are unemployed, out of almost three members of the average Serbian household, greatly affects the overall creditworthiness of the household. In practice, banks in Serbia consider individual creditworthiness in most cases, while the real financial strength (picture) of the family, perception of family structure, income and indebtedness of all family members, banks conduct in credit analysis only for housing loans, rarely for other types of loans to natural persons. Hence, we can also talk about the limitations of borrowing by natural persons for non-residential loans due to the limitations in creditworthiness as a result of individual consumption.

Individual consumption of households is certainly determined by the income that households earn, so it is necessary to analyze these data as well. The following chart shows the trends in individual consumption of households and available household funds in the analysis period, from the beginning of the global economic crisis in 2008 to 2019:

Chart 2. Trends in individual consumption and available household funds in Serbia from 2008 to 2019.



Source: SORS

Since a significant correlation was observed between the credit indebtedness of natural persons and individual consumption of households, a significant interdependence of both individual consumption and available household income was also observed. According to the official data of the Statistical Office of the Republic of Serbia, we notice that in the last eight years, individual consumption of households has been higher than disposable household income. Bearing in mind that in the last few years, credit indebtedness of natural persons has intensified, ie natural persons are withdrawing a larger amount of non-purpose loans that may be subject to individual consumption, the difference between available funds and individual consumption of households is most likely settled from credit sources.

From the beginning of the economic crisis in 2008 until 2019, the available household funds increased by 53.7%. This growth logically determined the growth of individual consumption. The correlation coefficient of available household funds and individual consumption is, as expected, quite high and amounts to r = 0.961. However, a somewhat slower growth of available household funds is observed.

In the presented data, we notice that in 2011/2012 we have a "turning point", which represents the moment when the annual amount of individual household consumption exceeds the annual amount of available funds until the end of the analyzed period, until 2019. In that period measures were adopted by the Government of the Republic of Serbia aimed at stabilizing public finances, which included reducing salaries in the public sector and reducing pensions, which certainly had an impact on the slow growth of available household funds. We will analyze the impact of credit indebtedness of natural persons to, and from the moment when individual consumption exceeds the available funds-household income in the Republic of Serbia.

Namely, from 2008-2012, there was an increase in claims of banks for non-residential loans to natural persons of 30.4%, but in that period the available household funds were above the individual consumption of households. For the period from 2012-2019, banks' credit claims for non-residential loans to natural persons increased by as much as 134.4%, and in the entire period, according to official SORS data, household individual consumption was above household disposable income.

If we divide the observation period of 12 years into two periods, the first from 2018 to 2012 and the second from 2012 to 2019, and if we compare arithmetic means ($\bar{X}$), average individual consumption ($\bar{X}$lp) and average available funds ($\bar{X}$rs) for the period 2008-2011 we get that the arithmetic mean of individual consumption $\bar{X}$lp = 54,797 dinars and the arithmetic mean of available funds $\bar{X}$rs = 55,355, we notice that in this period the average individual consumption is covered by the average income of households, because the average household income is higher.

For the period from 2012-2019, by comparing the arithmetic means, we get that the arithmetic mean of individual consumption is $\bar{X}$lp = 60,612 dinars and the arithmetic mean of available funds is $\bar{X}$rs = 59,261, which indicates that the average household income in this period is not enough to cover the average individual consumption of households.

This leads to the conclusion and additionally confirms the main hypothesis in the paper that natural persons in Serbia in the post-crisis period, since 2011 are more intensively borrowing non-residential loans, which affects the growth of individual consumption of households, because households do not have enough funds (income) to settles individual consumption. This may also lead to the conclusion that the income of natural persons is to some extent compensated by credit indebtedness, that natural persons due to insufficient solvency resort to credit funds specifically those credit funds that can be used for consumption (cash and consumer credit and allowed overdraft). The table below presents the summarized results of the research for the period 2008-2019.

Table 2. Review of the results of the analysis of the impact of credit indebtedness of natural persons, individual consumption and available funds of households in Serbia in the period 2008-2019.

	Loans to natural persons / individual consumption of households (2008-2019.)	$\bar{X}$rs > $\bar{X}$lp (2008-2011)	$\bar{X}$rs < $\bar{X}$lp (2012-2019)
Correlation coefficient-r	0,869	$\bar{X}_{rs}$ - $\bar{X}_{lp}$=55.355-54.797=558 with an increase in credit indebtedness of natural persons (excluding housing loans and without interest and fees) of 30.4%	$\bar{X}_{rs}$ - $\bar{X}_{lp}$=59.261-60.612= -1.351 with an increase in credit indebtedness of natural persons (excluding housing loans and without interest and fees) of 134.4%
Determination coefficient -r^2	75,46%.		
Alienation coefficient-k^2	24,54%		
Growth of banks' claims on natural persons for non-residential loans without interest and fees 2008-2019	218,4%		

Source: Author's calculation

It should be borne in mind that the expected motive for borrowing precisely when it comes to natural persons, i.e. households with lower incomes, where the gap, ie the difference between individual consumption and available funds, is "more negative".

Incomes of natural persons are not the same in all regions of the Republic of Serbia, so for a more detailed analysis we should have more precise data by regions, and for credit indebtedness of natural persons, to compare with data for individual consumption and household income. That may be the motive for some new research. The result of this paper is an analysis of available, official data, which are collectively presented, and which relate to the state of Serbia.

The obvious high level of positive correlation indicates that natural persons in Serbia are intensively borrowing and that they are paying off insufficient solvency with credit funds, having in mind the movement of available household funds and individual consumption of households. But it should be noted that natural persons make decisions on indebtedness due to the increased availability of loans to natural persons. Precisely in the period of analysis from 2008 until today, the permanent "liberalization" of the criteria for borrowing by natural persons from commercial banks is noticeable. Thus, we have that the once rigorous credit policy of the NBS, which implied a maximum burden on natural persons DTI ratio up to 30% (Debt to income), has reached today's 60% with most banks, for dinar cash and consumer loans (without indexation in foreign currency), as well as for allowed overdraft on the current account. The maximum amounts of credit indebtedness for these loans have been increased, maturities have been extended with fewer requirements for collateral than in previous years.

All of the above leads to the conclusion that natural persons in the post-crisis period until today, used the possibility of additional credit borrowing, which is a consequence of permanent long-term and gradual liberalization of the so-called retail credit market in Serbia. Bearing in mind that the banking sector's receivables from natural persons more than doubled in this period, we can say that in the long run such indebtedness, after a short-term positive impact on the amount of available household funds, may later negatively affect the purchasing power of natural persons ie households. The needs of individual consumption are met in a short period of time, and credit obligations last longer, and up to several years later. Then credit indebtedness becomes a burden for natural persons in a broader sense, and a problem of greater socio-economic significance.

Conclusion

The analysis of the presented data confirms the main hypothesis, which is that the increase in credit indebtedness of natural persons in the period after the global economic crisis and the recovery of the banking sector, replaces the lack of funds for individual consumption, especially given that according to official data, for the last eight year, the average available funds of households in Serbia are not enough to cover the average individual consumption of households.

From the total receivables of the banking sector from natural persons, housing loans and receivables for interest and fees are excluded in the analysis, which leaves cash and consumer loans and allowed current account overdrafts, because these funds can be used for individual consumption. In addition to the high positive correlation between credit indebtedness of natural persons and individual consumption of households, there is a significant increase in receivables from these loans to natural persons in the period from 2008-2019 by more than two times.

In this period, there is an accelerated increase in average individual consumption in relation to the average available funds of households, so according to official data, the last eight years of the analyzed period identifies a lack of funds to meet the average individual consumption of households. At the same time, the accelerated growth of credit indebtedness of natural persons for non-housing loans is noticeable.

Certainly, there are other factors that have an impact on individual consumption, but also on the credit indebtedness of natural persons. It should be borne in mind that the data are average and that there are certainly differences in the regions in Serbia in terms of disposable household income, as well as in individual consumption and indebtedness. If each region in Serbia were analyzed separately, we would get more precise results.

During the analysis period, the gradual liberalization of the retail credit market (retail loans) is noticeable, due to greater availability and higher amounts of primarily cash and consumer loans, which banks approve. During this period, banks to some extent lowered the criteria for the required minimum creditworthiness of natural persons, which certainly contributed to the increase in indebtedness of natural persons.

Household indebtedness may be the basis of economic growth, but this thesis is debatable in import-dependent economies. Increased individual consumption does not have a sufficient return impact on employment and gross domestic product, which would generate higher wages, and thus higher disposable household income. Higher disposable household incomes would reduce or eliminate the gap between individual consumption and available household resources, and most importantly, would reduce the need of natural persons for additional, often excessive borrowing.

The reduction of interest rates (Belibor for dinar loans), which has made loans to natural persons cheaper and more affordable, should not be a motive for borrowing by natural persons. A more rigorous DTI ratio, limiting the maximum loan amount, to changes in the classification of banks' balance sheet assets, where non-purpose loans to natural persons would entail a poorer classification and higher provisioning costs, could be some of the measures that can be applied. This would increase interest rates on non-housing loans, and to some extent reduce excessive household borrowing (Decision on the classification of balance sheet assets and off-balance sheet items of banks) and reduce the negative impact on individual consumption of over-indebted households.

Economic policy makers should pay special attention to the indebtedness of natural persons and the impact on individual consumption of households. The available funds of the average household should be sufficient to cover the average individual consumption in order to reduce the need for excessive borrowing, and on the other hand it is necessary to systematically limit excessive borrowing of natural persons and direct the credit potential of banks to the real economic growth of the domestic economy, employment, which would ultimately generate an increase in wages and the economic standard of the population.

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THE POSITION AND FACTORS OF CAPITAL MARKET DEVELOPMENT IN THE FINANCIAL SYSTEM OF THE REPUBLIC OF SERBIA

Abstract

In the financial system of the Republic of Serbia, the capital market does not play a significant role - it practically does not perform one of its basic functions - the transfer of resources from surplus to deficit sectors. The Belgrade Stock Exchange, as the only organizer of the Regulated Market and MTP in the country, played a one-time role of transfer and concentration of ownership in the first years of privatization. After that, and considering the significant costs and reporting obligations of listed companies, the delisting process followed - only companies that had to do so by force of law remained on the stock exchange. Also, although the last two decades have been marked by significant regulatory improvements (from shareholder protection, takeover obligations, transparency of public companies' operations), the trading platform is aligned with the practice of regional markets, new market participants are included in the market game (such as investment funds), the domestic capital market has all features of underdeveloped markets. The aim of this paper is to establish how the market participants themselves perceive the factors of capital market development. For this purpose, research was conducted by sending a Google questionnaire to the addresses of all members of the Belgrade Stock Exchange and all registered investment fund management companies. Participants in the research declared themselves on twelve statements that were formulated in such a way as to establish a connection between certain factors and the development of the capital market. The results of earlier research, which represent the basis for the formulation of said claims, are listed in this paper. In addition to the results of earlier research, the formulation of the mentioned claims was also conditioned by the appreciation of the specifics of the domestic capital market, as well as the author's knowledge based on many years of experience in dealing with securities. A five-point Likert scale of attitudes was established for each statement (from 1 to 5), which refer to the determination of respondents regarding the circumstances of the development of the capital market. Respondents were offered a choice between five answers

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from "Completely dissatisfied", "Partially dissatisfied", "Neither dissatisfied nor satisfied", "Partially satisfied" to "Completely satisfied". The results of the research are presented through frequencies and percentage representation for each claim. Concluding considerations stem from the created descriptive statistics. The results of the survey showed the highest degree of conviction of the respondents when they declare the conditionality of the development of the capital market on the one hand and good mechanisms for informing the investment public on the other. At the same time, the respondents were the most reserved when considering the relationship between foreign portfolio investments and the development of the capital market, that is, the chosen model of privatization and development of the capital market. The research concept represents a new approach in the study of the domestic stock market, with the basic intention to perceive the factors of capital market development from the perspective of the market participants themselves. The intention is to determine their value judgments on the basis of the views of the respondents, in relation to the twelve formulated claims, but also to provide guidelines for future research and potential improvements of the domestic capital market. Each individual claim provides a basis for specific further research, and longer time series data are a solid statistical basis for correlation and regression analysis of defined variables.

Key words: *capital market, privatization, regulation, development*

JEL classification: G1, G2

ПОЗИЦИЈА И ФАКТОРИ РАЗВОЈА ТРЖИШТА КАПИТАЛА У ФИНАНСИЈСКОМ СИСТЕМУ РЕПУБЛИКЕ СРБИЈЕ

Апстракт

У финансијском систему Републике Србије тржиште капитала нема значајну улогу – практично не обавља једну од основних функкција – трансфер ресурса од суфицитарних ка дефицитарним секторима. Београдска берза, као једини организатор Регулисаног тржишта и МТП у земљи, одиграла је једнократну улогу трансфера и концентрације власништва у првим годинама приватизације. Након тога, а с обзиром на значајне трошкове, те обавезе извештавања котираних компанија, уследио је процес делистирања – на берзи су остале само компаније које су то морале по сили закона. Такође, иако су последње две деценије обележиле битна регулаторна унапређења (од заштите акционара, обавезе преузимања, транспарентности пословања јавних друштава), трговачка платформа усаглашена са праксом регионалних тржишта, у тржишну утакмицу укључени нови тржишни учесници (попут инвестиционих фондова), домаће тржиште капитала има све особине неразвијених тржишта. Циљ овог рада је да се установи на који начин сами тржишни учесници сагледавају факторе развоја тржишта капитала. У ту сврху спроведено је истраживање упућивањем Гоогле упитника на адресе свих чланова Београдске берзе и свих регистрованих друштава за управљање инвестиционим фондовима. Учесници у истраживању су се изјашњавали о

дванаест тврдњи које су формулисане на начин да успостављају везу између појединих фактора и развоја тржишта капитала. Резултати ранијих истраживања, који представљају основу за формулисање речених тврдњи, наведени су у овом раду. Поред резултата ранијих истраживања, формулисање поменутих тврдњи било је условљено и уважавањем специфичности домаћег тржишта капитала, као и сазнањима аутора темељених на дугогодишње искуству у пословима са хартијама од вредности. Установљена је петостепена Ликертова скала ставова за сваку тврдњу (од 1 до 5), које се односе на опредељење испитаника у вези са околностима развоја тржишта капитала. Испитаницима је понуђено оптирање између пет одоговора од „Потпуно незадовољан“, „Делимично незадовољан“, “Нити незадовољан нити задовољан“, „Делимично задовољан“ до „Потпуно задовољан“. Резултати истраживања су исказани кроз фреквенције и процентуалну заступљеност за сваку тврдњу. Закључна разматрања происходе из креираних дескриптивних статистика. Резултати анкете показали су највиши степен уверења испитаника када се изјашњавају о условљености развоја тржишта капитала са једне стране и добрих механизама информисања инвестиционе публике са друге стране. Истовремено, анкетирани су најуздржанији када сагледавају однос између страних портфолио инвестиција и развоја тржишта капитала, односно изабраног модела приватизације и развоја тржишта капитала. Истраживачки концепт представља нови приступ у проучавању домаће берзе, са основном интенцијом да се фактори развоја тржишта капитала перципирају из перспективе самих тржишних учесника. Намера је да се на бази ставова испитаника, у вези са дванаест формулисаних тврдњи, утврде њихови вредносни судови, али и пруже смернице за будућа истраживања и потенцијална унапређења домаћег тржишта капитала. Свака појединачна тврдња даје основа за специфична даља истраживања, а дуже временске серије података су солидна статистичка основа за корелациону и регресиону анализу дефинисаних променљивих.

Кеу wордс: тржиште капитала, приватизација, регулатива, развој

Introduction

Despite the fact that the Belgrade Stock Exchange resumed operations in 1989 (under the name of the Yugoslav capital market), the economic and political conditions for the development of the domestic capital market appeared after the social changes of 2000. The proclaimed determination to join the European Union, the position of a small, open economy, the late privatization and the constantly present political and big capital interests shaped not only the capital market, but also the financial system of the Republic of Serbia as a whole. The dominance of banks and the almost marginal position of other financial institutions is one of the most noticeable characteristics of the domestic financial system. In such conditions, there is no interest of the academic public in significant research of the domestic capital market. However, there are certain studies that try to establish a connection between the development of the financial system and economic

growth in the Republic of Serbia, as well as the development of the domestic stock market and economic growth. Thus, Granger causality is used by authors Marinković and others to ascertain the interdependence of variable pairs as time series. The impact of a few of the examined variables on economic growth has been verified. The real GDP growth rate was impacted by stock market liquidity indicators, but there was no proof that the fluctuation in the stock market size and the real GDP growth rate were causally related. The lack of a causal relationship might be attributed to the shares' excessive market capitalization, which arises from open joint stock companies' legal duty to list their issued shares for trading on the Belgrade Stock Exchange. The study demonstrates that the liquidity of the market is far more significant than its size for the growth of the stock market and general economic expansion (Marinkovic et. al., 2013). Additionally, Božović examines the connection between Serbia's financial development and economic expansion, keeping an eye on the impact of the stock market and the expansion of the banking industry. It establishes the positive and statistically significant influence of bank loans and stock market liquidity on economic growth using the framework of the neoclassical growth model (Božović, 2019). Numerous articles that evaluate the effectiveness of the domestic capital market have been published. Stakić and others examine the application of the efficiency hypothesis of financial markets to the Serbian financial market, namely the Belgrade Stock Exchange (Stakić et. al., 2016). Živković and Minović, the authors, tackle one of the main issues facing the Serbian capital market for the first time: liquidity. The domestic capital market is also categorized as one of the so-called frontier markets, which are markets that lack the traits of developed markets but should eventually adopt emerging market traits in the future phases of growth. The report examines Serbia's frontier market's illiquidity from October 2005 to July 2009. They take into account the reasons behind the exceptionally high market illiquidity and its volatility in addition to the rise and fall in returns throughout the observed timeframe. It is concluded that the growth or decline in the participation of foreign investors is the most common cause of the dramatic decline or increase in market illiquidity and its volatility (Živković & Minović, 2010).

In this paper, we try to determine how direct market participants perceive the values and characteristics of the capital market. Therefore, an approach was used that tries to look at the position of the domestic capital market from a completely new perspective. Through respondents' responses to the provided Google questionnaire, the aim is to evaluate respondents' perceptions of the domestic market, identify fundamental weaknesses, as well as potential directions for improvement. The remainder of the paper begins with a review of the literature, followed by a summary of the Republic of Serbia's financial system, including the role of the capital market. An overview of the research -methodology and an explanation of the results are provided below. There are conclusions in the end.

Literature review

There are numerous factors that determine the development of the capital market. The institutional components of macroeconomic stability are typically seen as fundamental: a robust banking sector, price stability, and fiscal and monetary stability

are all presumptions for the growth of the capital market. It is necessary to develop an effective legal and regulatory framework in addition to macroeconomic stability. El Wassal suggests that more factors that impact supply and demand in the capital market should be included in this list (El Wassal, 2013).

In a recent paper, the authors Demekas and Nerlich identify two different phases of capital market development - the first, embryonic phase dominated by the government and the second, mature phase in which the capital market begins to serve the private sector. The success of capital market development is determined by distinct conditions and motivations for each phase (Demekas & Nerlich, 2020).

The state's participation in the capital market extends beyond its promotion and regulation; it also manifests itself as a direct player, such as when it sells bonds. In countries in transition, such as Serbia, the state also shaped the potential of the capital market in the future by selecting the privatization model. In the early years of the shift, there was unanimous agreement about the role that privatization played in the overall market transformation. According to Jeremić (2008), the privatization offer benefits local capital markets because: shares are typically issued by the biggest national state-owned companies; they have the largest investor base; these shares become market leaders; they create a rapper where none previously existed; as a result, many developing nations adopted the privatization sale of shares through a public offering on local stock exchanges, which resulted in a notable increase in stock exchange capitalization (Jeremić, 2008).

Perotti and Van Oijen's research explores the possibility that privatization in developing economies, by resolving political risk, has a noteworthy indirect impact on the growth of the local stock market. The presented evidence suggests that progress in privatization is indeed correlated with improvements in political risk. It is stated that one major factor contributing to the rapid expansion of stock markets in developing nations was mitigating the political risk associated with successful privatization (Perotti & Van Oijen, 2001).

Thus, the growth of regional capital markets mirrored the state's systemic approach, including its dedication to a particular privatization model. Therefore, in Poland's example, the privatization plan carried out through a sizable sale to strategic investors associated with the initial public offering (IPO) helped the Polish stock market by making it sustainable even during periods of slowdown in privatization activities. The data for other CEE nations, which revealed a significantly larger fall in stock market activity than Poland, contradicts this conclusion (Köke & Schröder, 2002). In a 2022 paper, Grittersová demonstrates—with the help of 25 Eastern European countries—that permitting foreigners to act as strategic investors in banks and the economy through the direct sale of state assets promotes institutional and legal development, particularly the development of a more robust and impartial legal system, as opposed to insider privatization models like voucherization or management buyouts, which do not serve the same purpose (Grittersová, 2022). However, Šuterová finds that the so-called tunneling was not as widespread as previously thought and that privatization funds did not have the negative impact on privatization that was previously thought when applying the standard capital price model (Šuterová, 2020).

It is no longer asserted that in developing economies, private ownership alone produces economic gains. The literature today reflects a more careful examination of privatization, as opposed to the dogmatic approach that predominated at the start of the transition. It is

specifically claimed that favorable outcomes require certain prerequisites, most notably an appropriate privatization process and regulatory architecture. A more recent study, from 2022, offers a comprehensive analysis of the historical perspective and privatization trends after 1980 globally. There are a number of reasons why state-owned company privatization occurred and why the process slowed down after 2008 (Kikeri, 2022).

Foreign investments can be made more easily into a country with a developed capital market, which is particularly beneficial for nations lacking in the required financial resources (Brzaković, 2007). The decision on where, how and when to invest depends on economic conditions and economic freedoms (Milovanović & Marković, 2022). The inflow of capital into developing countries and developed economies takes place in different patterns, since it adapts to different economic and political structures. From the point of view of the host country, especially developing countries, portfolio flows are considered to play a key role in bridging the savings investment gap and providing foreign currency to finance the current account deficit. That is why the role of foreign portfolio investments (FPI) and their impact on capital market development and economic growth is the subject of special attention of developing countries. Thus, recent papers examine the effects of FPI in the case of India (Prabheesh, 2020), Pakistan (Shabbir & Muhammad, 2019), Nigeria (Ezeanyeji & Maureen, 2019). Singhania and Saini's study looks at a sample of 19 industrialized and developing nations over a 10-year period (2004-2013) in an effort to discover the factors that influence FPI flows. It has been noted that in developed nations, trade openness, interest rate differential, host country stock market performance, and US stock market returns are important trendsetters; in developing nations, on the other hand, FPI inflows are significantly impacted by the freedom index, interest rate differential, host country stock market performance, trade openness, and US stock market returns, as well as the crisis period (2006–2008) (Singhania & Saini, 2018).

Analysis of the connection between developing nations' financial development and economic expansion is also given consideration. The studies that examine this subject and focus on the BRICS countries are more fascinating than others, given the subject's increasing political and economic significance. Consequently, a study conducted by Osaseri and Osamwonyi found a positive correlation between the indicators of stock market development and economic growth in the BRICS countries based on a time series of data spanning from the first quarter of 1994 to the fourth quarter of 2015 (Osaseri & Osamwonyi, 2019). Meanwhile, Guru and Yadav's paper demonstrates the mutually beneficial relationship between indicators of stock market development and the development of the banking sector in promoting economic growth Guru & Yadav, 2019).

The financial system in the Republic of Serbia - the position of the capital market

The most types of financial institutions recognizable in the practice of developed market economies is present in the financial system of the Republic of Serbia. Nevertheless, the Serbian financial system has the characteristics of a bank-centric on with an exceptional dominance of the banking sector. Table 1 shows that the share of the banking sector in the assets of the financial sector of the Republic of Serbia at the end of 2021 is above 90%.

Table 1: Share of individual types of institution in financial sector[4]

Sector	Assets, (bln RSD), 2020.	Share (%)
Banking sector	4.601	90,6
Insurance sector	314	6,2
Pension funds sector	47	0,9
Leasing	115	2,3

Source: Author, based on the Quarterly overview of financial stability indicators` trends in of the Republic of Serbia for the third quarter of 2021, 2021

At the same time, the total value of net assets of all UCITS funds on 31.12.2020, amounted to 51.7 billion dinars (Report on the activities of the Securities Commission and movements on the capital market January - December 2020, 2021)[5].

Serbia's capital market is small and poorly liquid. Both the supply and the demand sides of the market have barriers to the capital market's growth.

With a few private company outliers, government bonds make up the majority of the bond market. It is the sole well-functioning sector of the stock market. In the initial period of the transition the stock market served to consolidate the ownership of privatized companies. Many corporations looked for a mechanism to be delisted from the stock exchange following the ownership consolidation in order to escape the financial and disclosure requirements that were set forth for public companies. At the end of 2018, the initial public offering took place, the first and only one after the restoration of the Belgrade Stock Exchange in 1989. Much has been written on the possible significance of initial public offerings (IPOs) and the reasons why they are not common in the domestic stock market's operations. In one paper on this subject, the author particularly apostrophizes the unwillingness of the state to recognize the importance of the capital market and to sell some state-owned enterprises through an IPO (Erić, 2013). In principle, "the stock exchange performs a key function in providing the necessary critical links between companies that need funds to start new businesses or to expand their current operations and investors who have excess funds to invest in such companies" (Avdalovic & Milenković, 2017, p. 562). However, in the case of Serbia, the stock market is generally not perceived as a potential source of additional equity or debt capital. The growth of the securities markets and their suitable role in Serbia's overall financial and economic development are contingent upon several essential characteristics, including credibility, disclosure, competence, and institutional independence (Šoškić, 2017). Finally, it is necessary to refer to the absence of elementary financial literacy and education of the population of Serbia, as a prerequisite for using alternative financial opportunities (Rakočević et. al., 2021).

The Belgrade Stock Exchange is the sole organiser of the MTP and Regulated Market in the Republic of Serbia. The regulated market is divided into two segments: Listing and Open Market. There are three listings within the Listing segment: Prime Listing, Standard Listing and Smart Listing. Table 2 displays the realised turnover value in dinars and euros for the year 2021 together with the total number of transactions per market segments where trading is conducted.:

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[4] According to the Quarterly report of the NBS, the share of financial sector (excluding investment (UCITS) funds) y GDP of Serbia amounted to 92,9%.

[5] The financial sector, shown in the previous table 1 refers to institutions whose operations are supervised by the NBS. The Securities Commission controls the operations of investment funds

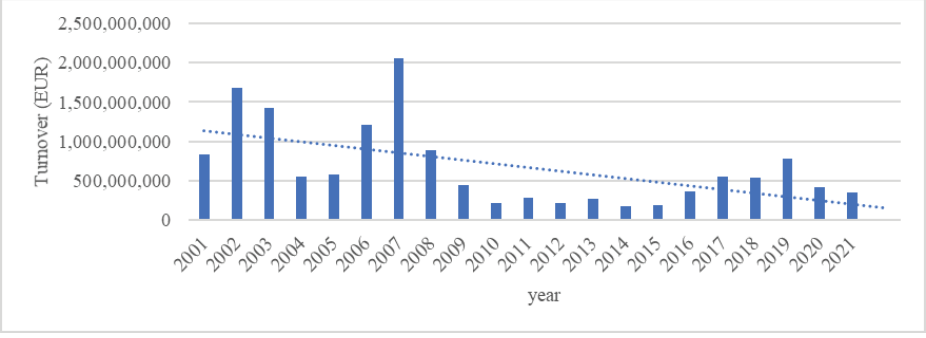
Table 2: Total turnover and number of transactions regarding the market segment, 2021

Market segment	Turnover (RSD)	Turnover (EUR)	Number of transactions
Regulated	37.716.264.748	320.785.365	14.003
Listing	36.365.408.473	309.295.748	11.549
Prime – stocks	475.823.703	4.047.039	10.147
Prime – bonds	34.748.478.649	295.543.621	712
Standard - stocks	1.141.106.121	9.705.088	690
Open market	1.350.856.275	11.489.617	2.454
Open market - stocks	1.350.856.275	11.489.617	2.454
MTP	3.514.930.228	29.894.505	4.740
MTP – stocks	3.514.930.228	29.894.505	4.740
MTP - bond			
Total	41.231.194.976	350.679.870	18.743

Source: Author, based on the Report on the activities of the Securities Commission and movements on the capital market January - December 2021, 2022

Although stock market turnover fell dramatically in 2020 due to the Covid-19 virus pandemic, the same trend continued in the following year. The total realized turnover on the Regulated and MTP market in 2021 was approximately 15.4% lower compared to the same period in 2020. (Report on the activities of the Securities Commission and movements on the capital market January - December 2021, 2022). Generally speaking, stock market trading is conducted at much lower levels now than it was in the years prior to the World Economic Crisis (Figure 1).

Figure 1: Turnover on the Belgrade Stock Exchange (EUR), in the period 2001-2021

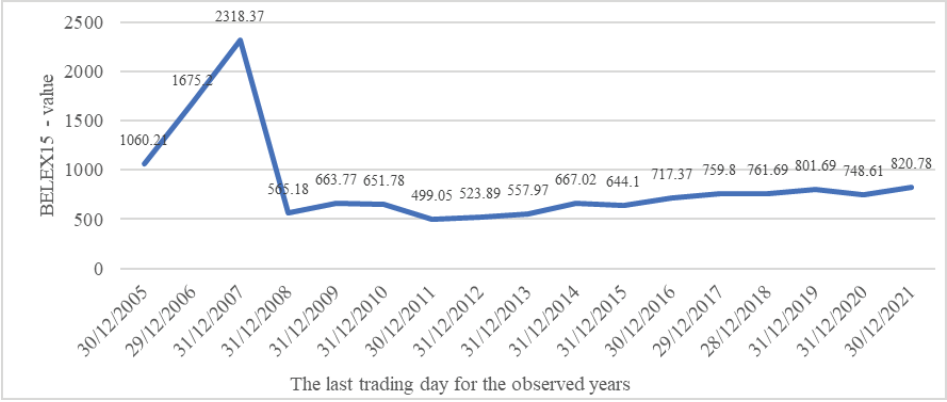


Source: Author, based on https://www.belex.rs/trgovanje/izvestaj/godisnji

The first ownership concentration and the strong growth rates of representative indices, together with the increasing interest of many even small investors, were the causes of the stock market's initial impetus before to the global financial crisis. However, over six months before to the start of the global economic crisis, in March 2008, the trend of the staggering decrease of stock market indices started. The subsequent sharp decline revealed the domestic stock market's fundamental flaws—a lack of depth, liquidity, and transparency, or, to put it another way, a lack of sound underpinnings. The time

that followed only served to solidify that impression. Specifically, the Belgrade Stock Exchange has never gotten close to the index's pre-crisis values, in contrast to the major stock exchanges in the globe and the markets in Eastern and Central Europe (Figure 2).

Figure 2: The value of the Belex15 index on the last trading day in the period 2005-2021



Source: Author, based on Author, based on https://www.belex.rs/trgovanje/indeksi/belex15/istorijski/3y

All registered participants on the domestic stock exchange in 2021 are displayed in Table 3. Following the global economic crisis, there has been a noticeable stagnation or reduction in the number of individual market players; this is particularly noticeable with regard to broker-dealer firms - in 2007 there were 74[6] of them while in 2021 only 15 of them are operating.

Table 3: Registered participants on capital market, 2021

Participants	Number
Broker-dealer companies	15
Banks	8
Custody banks	5
Investment fund management companies	5
Investment funds - UCITS	19
Brokers	1.135
Portfolio managers	132
Investment advisors	47
Stock-exchange	1

Source: Author based on Report on the activities of the Securities Commission and movements on the capital market January - December 2021, 2022

The easiest way to determine the relative standing of the domestic stock exchange is to make comparisons with other countries. Table 4 displays the market capitalization as a percentage of GDP for a chosen set of countries. It is clear that Serbia is faring poorly in comparison to the nations that underwent the so-called economic transition.

[6] Report on the activities of the Securities Commission of the Republic of Serbia and developments on the securities market in 2007, KHOV, 2008, p. 54

Table 4: The share of market capitalization in the GDP, 2020

State	Share in %
Germany	59,38
Spain	59,24
Greece	27,00
Croatia	38,86
Japan	133,29
Hungary	17,84
Poland	29,75
Romania	10,23
Russian Federation	46,68
Serbia*	8,23
Slovenia	15,76
Bulgarian	25,34
USA	194.89

** The data refers to the year 2011*

Source: Author, based on https://data.worldbank.org/indicator/CM.MKT.LCAP.GD.ZS

Significant institutional and regulatory advancements have occurred over the past ten to fifteen years, ranging from new regulations pertaining to investment funds and the capital market itself to the regulation of firms and takeovers. It has been demonstrated, therefore, that while important, a suitable institutional and regulatory framework is insufficient in and of itself to ensure the growth of the capital market. Specifically, the perception is that there is a lack of the state's fundamental interest in making this financial system segment more significant. It was impossible for domestic enterprises to view the stock market as a possible source of loan or equity financing under such circumstances, as was already highlighted. There was no fundamental motivation for the growth of the local stock market due to the concurrent lack of interest from institutional and other investors, both domestic and foreign. Therefore, the capital market's current state and its past development do not support the notion that it will soon begin to take on a new role inside the domestic financial system.

Research - methodology

A Google questionnaire was sent to the addresses of every registered investment fund management company and member of the Belgrade Stock Exchange in order to perform the research[7]. The questionnaire was completed by 137 individuals, which is regarded as a statistically significant sample. A five-point Likert scale of attitudes was

[7] It is part of a more extensive research from the author's doctoral dissertation on the approved topic: "The role of investment funds in the development of the capital market".

established for each claim (from 1 to 5), which refer to the position of the respondents in relation to the circumstances of the development of the capital market. The following table displays the five options that respondents could select from, ranging from "Completely dissatisfied" to "Completely satisfied". The obtained data were statistically processed in IBM SPSS 26 and SAS JMP Pro 16.

Table 5: Five-point Likert scale of attitudes

Answers offered	**Scale**
Completely dissatisfied	1
Partially dissatisfied	2
Neither dissatisfied nor satisfied	3
Partially satisfied	4
Completely satisfied	5

Source: Author

The participants in the research declared the following statements (table 6):

Table 6: Capital market development - claims

Claim 1	*The development of the capital market results in a reduction of transaction costs.*
Claim 2	*Developed capital markets are characterized by high market transparency*
Claim 3	*A developed capital market is characterized by high liquidity and low volatility*
Claim 4	*Privatization processes contribute to the development of the capital market*
Claim 5	*The choice of the privatization model (auction/voucher) influenced the development of the capital market in those countries*
Claim 6	*An efficient legal system is a prerequisite for the development of the capital market*
Claim 7	*A developed capital market and good mechanisms for informing the investment public are mutually dependent*
Claim 8	*Good prospects for foreign portfolio investments are a prerequisite for the development of the capital market and vice versa*
Claim 9	*A developed capital market requires the introduction of all modern market participants into investment practice*
Claim 10	*A stable and developed capital market reduces the possibility of financial panic*
Claim 11	*The development of the capital market is conditioned by a stable and developed banking sector*
Claim 12	*A high level of economic development and favorable development perspectives contribute to the development of the capital market*

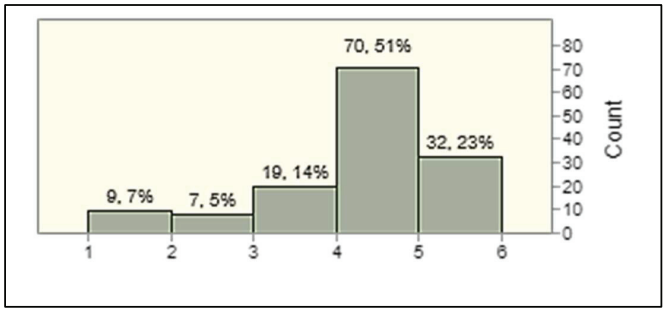
Source: Author

The stated claims are based on the findings from the literature, presented in the introduction and literature review of this paper, while respecting the specifics of the domestic stock market. The author's many years of experience influenced the final formulation of the claims. The results of the survey are expected to provide reliable first-hand information - from the market participants themselves - whose interpretation can be a useful basis for analysis and future research. Namely, regardless of the presented weaknesses of the domestic capital market, more than three decades of modern operation of the Belgrade Stock Exchange are a significant base of experience of market participants, which provides sufficient grounds for their credible observations and conclusions. On the other hand, the results of the survey can be a useful guide for the actions of the political creators of the economic and financial environment.

Research results

The position of respondents - frequencies and percentage representation for Claims 1-12 are shown in Figures 3 - 14.

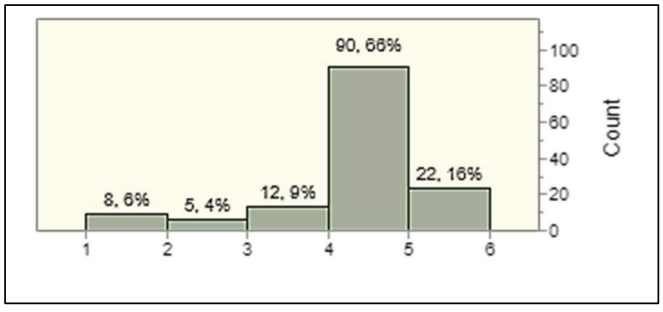
Figure 3: Frequencies and percentage representation of Claim 1



Source: Author

Figure 3 shows that in relation to Statement 1, 70 respondents, 51% of those surveyed, took the position "Partially satisfied", and that a total of 16, that is, 12% of those surveyed, were completely and partially dissatisfied.

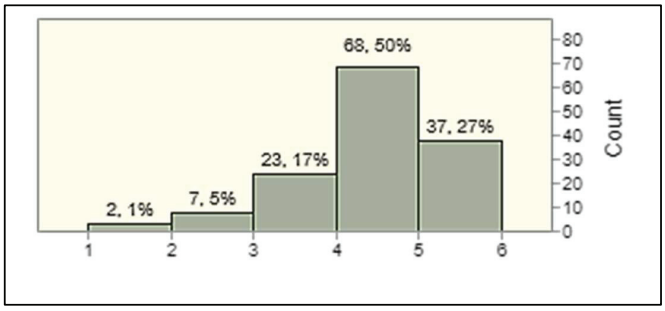
Figure 4: Frequencies and percentage representation of Claim 2



Source: Author

More than, 90 respondents, or 66% of the respondents, declared themselves "Partially satisfied" with regard to Statement 2 (Figure 4). If 22, or 16% of respondents who declared themselves "Completely satisfied" are added to this number, it follows that 82% of respondents share position 4 and 5 on the displayed scale.

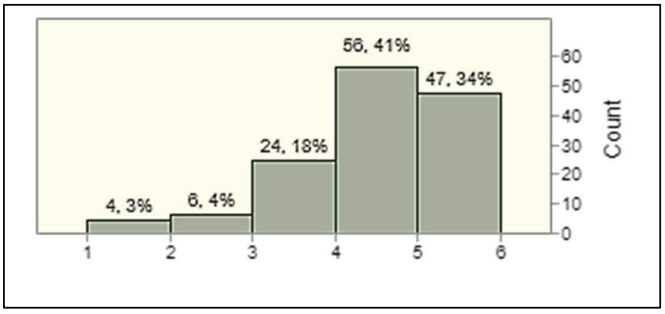
Figure 5: Frequencies and percentage representation of Claim 3



Source: Author

Market participants show a similar sentiment regarding Statement 3 – 105 of them, or 77% of the respondents, are completely or partially satisfied (Figure 5).

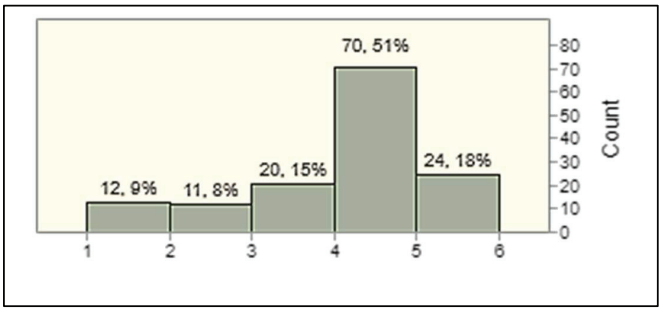
Figure 6: Frequencies and percentage representation of Claim 4



Source: Author

Only 7% of respondents declared themselves partially or completely dissatisfied with Statement 4 - the rest took positions 3-5 on the presented scale (Figure 6).

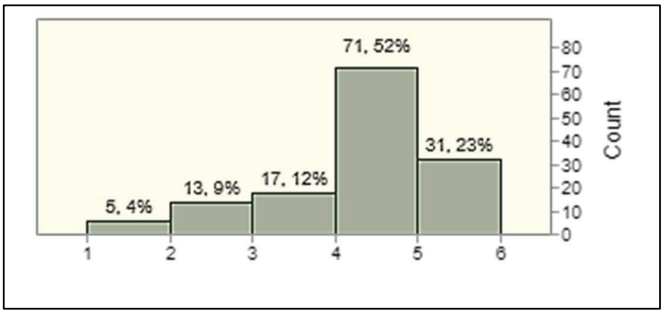
Figure 7: Frequencies and percentage representation of Claim 5



Source: Author

In relation to Statement 5, there are more dissatisfied, 17%, while the others took positions 3-5 on the presented scale (Figure 7).

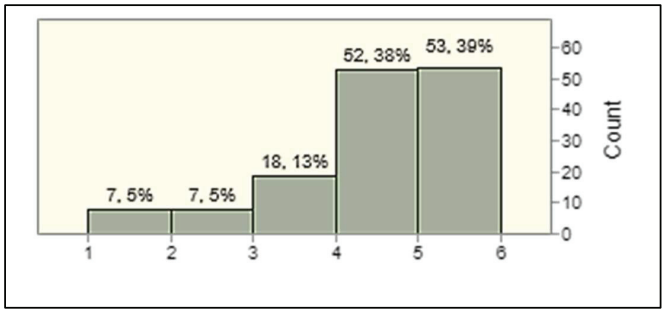
Figure 8: Frequencies and percentage representation of Claim 6



Source: Author

Figure 8 shows that in relation to Claim 6, 71 respondents, 52% of those surveyed, took the position "Partially satisfied", and that a total of 18, that is, 13% of those surveyed, were completely and partially dissatisfied.

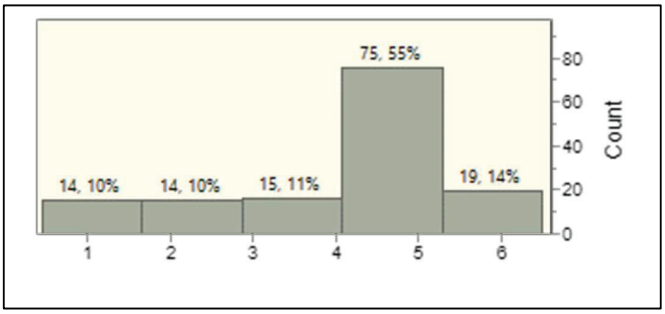
Figure 9: Frequencies and percentage representation of Claim 7



Source: Author

A total of 105 respondents, 77% of them declared themselves completely or partially satisfied, while 10% of respondents were completely or partially dissatisfied with regard to Claim 7 (Figure 9)

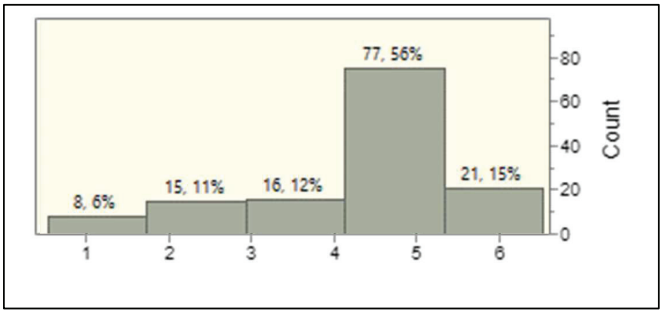
Figure 10: Frequencies and percentage representation of Claim 8



Source: Author

Figure 10 shows that 43 respondents, 31% of respondents did not declare themselves fully or partially satisfied with regard to Statement 8.

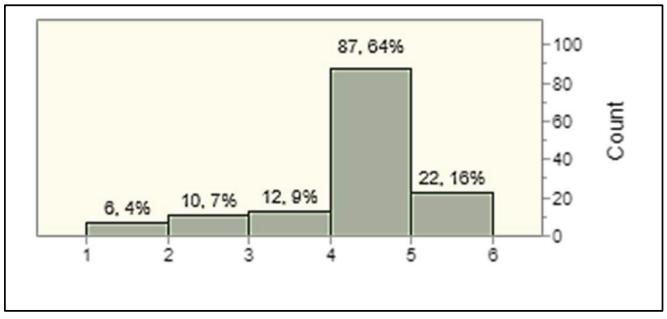
Figure 11: Frequencies and percentage representation of Claim 9



Source: Author

Regarding Claim 9, 56% of respondents are partially satisfied, and 15% of them are completely satisfied (Figure 11).

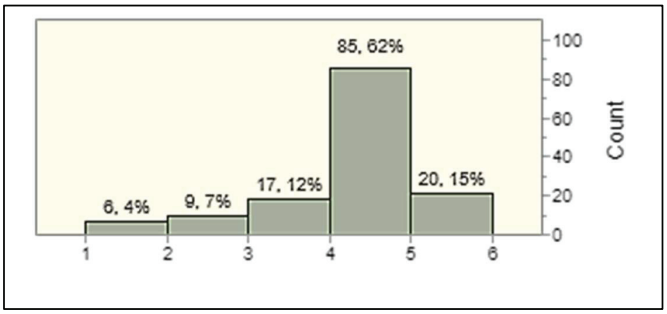
Figure 12: Frequencies and percentage representation of Claim 10



Source: Author

A total of 109 respondents, 4/5 of those surveyed declared themselves completely or partially satisfied, while 11% of respondents were completely or partially dissatisfied with regard to Statement 10 (Figure 12).

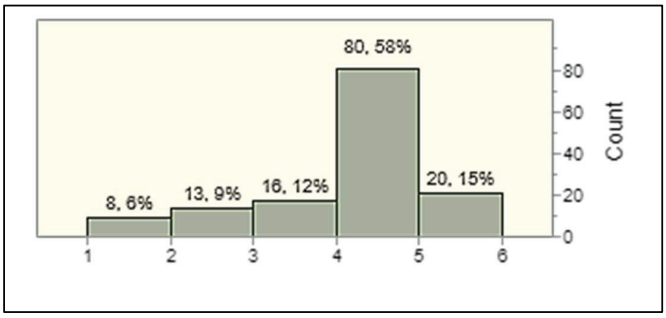
Figure 13: Frequencies and percentage representation of Claim 11



Source: Author

Regarding Statement 11, only 11% of respondents are completely or partially dissatisfied, while 77% took position 4 and 5 on the presented scale (Figure 13).

Figure 14: Frequencies and percentage representation of Claim 12



Source: Author

Positions 1, 2 and 3 on the presented scale were taken by 27% of respondents when they declared themselves about Statement 12. The other 73% of respondents were partially or completely satisfied with the same statement (Figure 14).

Conclusions

Table 7 provides descriptive statistics of frequency and percentage representation for the stated claims from 1 to 12. We can see the following (figures 3 to 14):

- that the maximum attitude 5 is in statement 7 and it amounts to 53, or 38.7%, and the minimum attitude 5 is in statement 8 and it is 19, or 13.9%, out of a total of 137 respondents,
- that the maximum attitude 4 is in claim 2 and it amounts to 90, or 65.7%, and the minimum attitude 4 is in claim 7 and it is 52, or 38.0%, out of a total of 137 respondents,

- that the maximum attitude 3 is in claim 4 and it amounts to 24, or 17.5%, and the minimum attitude 3 is in claim 2 and amounts to 12, or 8.8%, out of a total of 137 respondents,
- that the maximum attitude 2 is in statement 9 and it amounts to 15, or 10.9%, and the minimum attitude 2 is in statement 2 and it is 5, or 3.6%, out of a total of 137 respondents, and
- that the maximum position 1 is in statement 8 and it amounts to 14, or 10.2%, and the minimum position 1 is in statement 3 and it is 2, or 1.5%, out of a total of 137 respondents.

Table 7: Descriptive statistics

Claims	**Attitudes**					
	1	**2**	**3**	**4**	**5**	**In total**
***Claim* 1**	9 6.6%	7 5.1%	19 13.9%	70 51.1%	32 23.4%	137
***Claim* 2**	8 5.8%	5 3.6%	12 8.8%	90 65.7%	22 16.1%	137
***Claim* 3**	2 1.5%	7 5.1%	23 16.8%	68 49.6%	37 27.0%	137
***Claim* 4**	4 2.9%	6 4.4%	24 17.5%	56 40.9%	47 34.3%	137
***Claim* 5**	12 8.8%	11 8.0%	20 14.6%	70 51.1%	24 17.5%	137
***Claim* 6**	5 3.6%	13 9.5%	17 12.4%	71 51.8%	31 22.6%	137
***Claim* 7**	7 5.1%	7 5.1%	18 13.1%	52 38.0%	53 38.7%	137
***Claim* 8**	14 10.2%	14 10.2%	15 10.9%	75 54.7%	19 13.9%	137
***Claim* 9**	8 5.8%	15 10.9%	16 11.7%	77 56.2%	21 15.3%	137
***Claim* 10**	6 4.4%	10 7.3%	12 8.8%	87 63.5%	22 16.1%	137
***Claim* 11**	6 4.4%	9 6.6%	17 12.4%	85 62.0%	20 14.6%	137
***Claim* 12**	8 5.8%	13 9.5%	16 11.7%	80 58.4%	20 14.6%	137

Source: Author

The results show that the respondents who declared themselves "Completely satisfied" were the most numerous, opting for claim 7, which reads: *A developed capital market and good mechanisms for informing the investment public are mutually dependent*. This observation indicates the importance given by respondents in Serbia to the obligation of public companies in terms of disclosure and information and is consistent with the basic findings from the World Bank's publication entitled Capital Market Development: Causes, Consequences and Order, which summarizes theoretical

and empirical research that originated in the last 20 years, which concern this issue (Carvajal et al., 2020). The authors Carvajal and Elliott in an earlier paper (2007.) deal with the issue of securities regulation, which includes the regulation of public issuers of securities, secondary markets and market intermediaries, and in particular they apostrophize overcoming the problem of information asymmetry between issuers and investors, clients and financial intermediaries and between counterparties in transactions to ensure the smooth functioning of trading and clearing and settlement mechanisms, prevent market disruption and strengthen investor confidence (Carvajal & Elliott, 2007). On the other hand, the participants of the survey, who declared themselves as "Completely dissatisfied", were the most in favor of claim 8, which reads: *Good prospects for foreign portfolio investments are a prerequisite for the development of the capital market and vice versa*. In relation to the last one, statement 8, it is interesting to note that about 31% of the respondents opted for the offered scale with the answer 1-3. The impression is that the caution shown by participants in the domestic capital market when they declare the importance of foreign portfolio investments is also related to the role that foreign investors played in the stock market crash in 2008. Some findings from the literature support this point of view. Thus, in a paper from 2011, which investigates the contribution of foreign investors to the development of the capital market in an emerging economy, it is concluded that foreign portfolio investments, as well as foreign securities issues, made an insignificant contribution to market development compared to alternative factors such as domestic investments in securities and domestic issuance of securities (Edo, 2011). On the contrary, as stated in the literature review of this paper, the inflow of foreign capital, including the form of FPI, is considered by many authors to be a prerequisite for the development of financial systems, especially in developing countries. Respondents show a similar level of restraint only in claim 5: *The choice of the privatization model (auction/ voucher) influenced the development of the capital market in those countries*. Namely, about 32% of the respondents chose the answer 1-3 on the offered scale, expressing their opinion on this claim. It seems that the direct market participants are not convinced that the privatization model influenced the development of the capital market. In the Republic of Serbia, after 2000, there was a turning point in the proclaimed model of privatization - instead of mass, insider privatization, the professional public then almost unanimously supported the model of auction (tender) sales. There is no such consensus today, on the contrary, numerous controversies and not infrequent scandals that followed the privatization of social capital silenced the almost apologetic proponents of the sale of social capital forever. Privatization did create the necessary market material, but by itself it was not a sufficient basis for the development of the domestic stock market. In addition to referring to recent reviews of privatization processes and, in particular, selected models, which are indicated in the literature review of this paper, at this point we should refer to the observations from the study authored by Estrin and others. Namely, in the paper, the authors investigate the impact of differences in the privatization method on national economic performance in transition economies, using dynamic panel data methods, for 23 countries for the period 1990-2001. years. Among other things, the study concludes that mass privatization has a significant positive effect on growth across a wide range of definitions and specifications. The analysis shows that the advantage of mass privatization was that it spontaneously led to the development of the capital market, which is significantly correlated with economic growth (Estrin et. al., 2004).

The domestic capital market in the years preceding the World Economic Crisis (2008), and especially in the years that followed, was not the subject of significant interest from the investment and professional economic public. This is partially understandable, given that the bank-centric financial system was inaugurated in the Republic of Serbia, which, since it was outside the focus of economic and financial policy makers, positioned the domestic stock market on the margins of the financial system. However, this circumstance does not exclude the possibility of future research on this topic. On the contrary, we are of the opinion that the approach used in this paper, which provides information from the market participants themselves, creates a basis for a more thorough investigation of individual observations. For example, longer time series of data now provide an opportunity to investigate the relationship between indicators of economic growth and stock market growth and vice versa; between indicators of the development of the banking sector and the capital market, based on correlation and regression analysis. Also, given that the domestic bond market is almost entirely related to government bonds, and that it is the most important segment of the domestic stock market, there is a wide range of interest in researching the current development of this market segment, its investment base, but also space for potential expansion of the circle issuers.

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TAXES AND THE TAX SYSTEM IN AGRICULTURE OF THE BYZANTINE EMPIRE FROM THE III TO THE IX CENTURY[2]

Abstract

The topic of the paper is tax and the tax system of the Byzantine Empire. The tax system analysed in this paper was created and applied from the 3rd to the 9th century. In this research, the author tried to point out the changes that took place in the property relations in the agriculture of the Empire, which in many ways affected the organization and method of tax collection. The paper provides an analysis from which it can be noted that the organization of tax collection followed the changes that took place in Byzantine society. Agricultural production in the first centuries was based on the relationship between the colonists and the landowners. That relationship began to change from the beginning of the 7th century, when an increasing number of free peasants began to appear in agricultural production. The Roman and then the Byzantine system of tax collection was based on the registration of the land in the cadastre. Every land owner had to be registered in the cadastre, and thus was obliged to pay taxes. The financial administration of the Empire gave estimates every year of how much tax should be collected. The tax system in these times is going through changes in the way it is collected. The old relationship in which head tax and land tax are collected is abandoned and a system of special assessments, household tax and land tax is introduced. The changes that occurred in the method of tax collection influenced the further development of relations in Byzantine agriculture. Throughout this period, taxes were collected in money, mostly gold.

Key words: Byzantium, Rome, tax, tax system, money, peasants, agriculture.

Jell classification: B11, N01, N13, N53, N63

ПОРЕЗИ И ПОРЕСКИ СИСТЕМ У ПОЉОПРИВРЕДИ ВИЗАНТИЈСКОГ ЦАРСТВА ОД III ДО IX ВЕКА

Апстракт

Тема рада је порез и порески систем Византијског царства. Порески систем који је анализиран у овом раду настао је и примењиван је од III до IX века. У овом истраживању аутор је покушао да укаже, на промене које су се десиле у својинским односима у пољопривреди Царства, а које су у много чему утицале на организацију и начин прикупљања пореза. У раду је дата анализа из које се

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може приметити да је организација прикупљања пореза, пратила промене које су се дешавале у византијском друштву. Пољопривредна производња је у првим вековима била је заснована на односу колона и земљопоседника. Тај однос почиње да се мења од почетка VII века, када почиње да се у пољопривредној производњи појављује све већи број слободних сељака. Римски, а потом и византијски систем прикупљања пореза се заснивао на упису земље у катастре. Сваки власник земље морао је да буде уписан у катастар, а самим тим је био у обавези да плати порез. Финансијска администрација Царства је сваке године давала процене колико треба да се скупи пореза. Порески систем у овим временима пролази кроз промене у начину његовог прикупљања. Стари однос у коме се наплаћују главарина и земљарина се напушта и уводи се систем посебних процена, пореза на домаћинство и пореза на земљу. Промене које су настале у начину прикупљања пореза су утицале на даљи развој односа у византијској пољопривреди. У целом овом периоду порез се прикупљао у новцу и то углавном златном.

Кључне речи: Византија, Рим, порез, порески систем, новац, сељаци, пољопривреда.

Introduction

Agricultural production was the main economic branch of the Roman and Byzantine Empires. Farming, related to grain production, was dominantly present, but livestock, vegetable growing, viticulture, and fruit growing were also represented. Agriculture was an important part of production. The relationships in agricultural production that arose between those who use the land and produce wealth from it and those who own it or control how it is benefit is crucial to understanding how late Roman and early Byzantine society functioned.

One of the taxes of the Eastern Roman Empire, later the Roman Empire, was a tax collected based on agricultural holdings. The land tax was the tax because agricultural production represented the main segment of the Empire's economic development. This type of production included more than 80% of the economy of this country. The collection of this tax was very important for the country's survival.

Taxes were an important source of income in the Byzantine economy. For this reason, the paper provides an overview of the evolution of taxes and the tax system, which has undergone main changes in the period under review, which is almost five hundred years. During this period, the state of adjusting its finances to the newly emerging situations on the ground. This ability to adapt shows us the endurance of Byzantium and its society. So, taxes, as the system's taxes that were applied had to be adapted. Their adaptability is also indicated, by the fact that the Byzantine state managed to survive the first centuries, conditioned primarily by the reduction of the state's territory. The well-implemented monetary reform and the completed fiscalization of society worked well. A well-implemented monetary reform and successfully implemented fiscalization of society, which included the collection of taxes in money, worked.

Studying the way taxes are collected and the functioning of the tax system in the conditions of the crisis caused by wars, the reduction of the population, and the reduction of the state territory, and how the state and society overcame this crisis represents the goal of our studies in this paper.

Methodology and data sources

In this paper, the author uses methods that best reflect the character of the analysis given in the headline on the topic. In the research on the development of the structure of agricultural production and the creation of opportunities for tax collections, an overview of how the tax system has organized the analysis of the description of legal texts and sources dominated. The limited number of sources that could be usefully used, in elucidating this aspect of the economic history of early Byzantine society represented a primary obstacle during the preparation of this work. We could only use legal texts from the late 6th century above, all Justinian's Code (Corpus Iuris Civilis) of 529 AD, especially the Imperial Novels and the Agrarian Law from the late 7th or early 8th century (which is still much debated as to date, origins and measures, and whether these rules can be applied, to the entire empire), followed by the preserved papyri of this time. When preparing our work, we also used various scientific references related to this topic, especially the latest published results in agricultural production and tax collection. On this occasion, we had to rely mainly on foreign literature which deals with this topic. Unfortunately, literature in the Serbian language is rare and is mainly on the texts of older authors, for example, Georgije Ostrogorski.

During the research, content analysis of secondary data sources was also used. Secondary data is information about the history of late Roman and early Byzantine (Eastern Roman) society collected from relevant literature. It should be noted that Internet information, which is numerous and significant, was also used.

In the paper, the author indicates to point out that well-organized agricultural production created conditions in which the imperial administration could collect taxes without primary problems. Conversely, poorly organized production and the existence of various crises could lead to problems in the smooth functioning of the state. The result of this research is, as can be seen from the text of the paper, an attempt to understand the full role and importance of the well-organized tax collection system of this time.

In this paper, the author indicates to give insight into the organization of early Byzantine society in agricultural production, but also how the state collected taxes in these turbulent and transitional times, which marked the first centuries of the state's existence.

Organization of agricultural production from the 5th to the 7th century

Agricultural land was owned by the country's large and small landowners and free peasants. Holdings were usually scattered, with farm holdings being the exception. For the most part, the state and the Church owned large estates that originated by imperial and confiscated land or from various private donations, which were given to the state and the Church. Estates called domus divine (imperial estates) were owned by the state and managed by specialized persons. They were the organizers of the work. Such estates were dominant in Cappadocia and eastern Asia Minor and documented in Egyptian papyri. The estates of senatorial families were smaller in the east than in the west.

The state but also other landowners, lease their land to tenants, that is, to peasants who received leases. The increasing use of the tenancy institute, to which large and small landowners turn, led to its spread during the 6th century. The land was cultivated for the most part by dependent peasants of one or another category, i.e. dependent or free colonists. (Sirks, 2022, 8-9).

Procopius describes the conditions in the large estates to the west of the Empire in his work "Gothic Wars". In this part, he introduces us to the realistic situation on the field. In states that were out, a small number of landowners had problems with the liquidity of their incomes and pointed out that they had a semblance of independence as land tenants.

Admittedly, in that situation, tenants could also become owners of the agricultural land they cultivate. In practice, this meant that there was only one source of income from agricultural land, which, under normal circumstances, was shared by the landowners and the state. In emergencies, the state kept all that income. (Procopius, 2006, 23-32) In Procopius's text, we learn that large private landowners in the late Roman Empire did not turn their backs on the state and didn't get rich on their established latifundium. On the contrary, Procopius shows us that in the 6th century in Italy, the incomes of the large landowners were closely linked to the state income and that the state could, if necessary, take it away completely. It is far from the fact that in some situations, there was no conflict between large landowners and the state. In reality, they cooperated well with each other. On the other right, the Church has had large areas of agricultural land. The Church was organized as a public institution, the maintenance of which depended on the income from taxes that the state did not take from it. They considered that the Church was holy and not subject to the obligation of taxation. (Goffart, 1972, 383-384). Small agricultural landowners are not included, in Procopius' text. They probably existed. In the text, Procopius considered only the income that came from large agricultural estates. In the east of the country in Egypt, on the other hand, on the example of the estate in Apion, which had 31,000 ha and was located in the territory of the Antaeopolis district, we can use the preserved papyri to analyze the size of the agricultural estate in the village of Afrodito. (Bagnall, 2007, 232-233). One estate in this village had about three-fifths of the total agricultural land and the remaining two-fifths was distributed among the inhabitants who lived in the nearby towns (25% of the taxpayers, among whom was the monastery. Together, they owned a third of the land) and finally peasants, as the largest group (75% of taxpayers). Inequality was greater between the owners, who lived in the surrounding towns, rather than among the peasants themselves. In this group of small landowners, there was still a base of small landowners at the beginning of the 6th century. Most of these landowners had enough land to support a family and there was a wide circle of middle-class people who were able to meet their obligations." (Bagnall, 1992, 128-149). Large landowners could set aside part of their agricultural surplus to lend funds to peasants who sold their crops in advance of waiting for the future harvest to repay the debt from the previous year. However, the economic independence of the small freeholder of the land and the conclusion of the lease amount of taxes paid to the state are still much debated. (Banaji, 201-202, 2007). From this time distance, there is no way to estimate the share of landless peasants in the real income which one is subject to taxation.

In the period from the 6th century, the colonists constituted the largest group of the population engaged in agricultural production. They were limited to staying on the farms

they cultivated for times of up to thirty years, after which they were allowed to leave. It primarily referred to the columns that were (liberals) free. Other dependent colonies (adscripticius) were tied to their estates by inheritance. The term colon originally denoted a free peasant and then a free tenant of an estate with the same legal status as a landowner. Since the middle of the 3rd century, there have been changes in the relationship between the lessor and lessee. The dependent status of Kolan is becoming more common, and it is confirmed in land lease agreements. By the middle of the 5th century, the status of columns becomes hereditary, and from the 6th century, most columns become effectively unfree in their right to move freely. They start calling them "slaves of their country" more and more often. Only their lessor could release them from the obligation under certain conditions.

So, in practice in the 6th century, the columns gradually became more and more unfree. The term adscripticius or unfree colony referred to the fact that they were increasingly registered in the land registers (cadastres), together with their holdings, but under the name of their lessor or landowner. On the other hand, free colonists or liberals, although they were free, and thus had the right to make wills and transfer and inherit property. Theirs freedom became more and more formal for them over time. In the time of Emperor Anastasius 491-518) were forbidden to leave their estates. Their tax obligations do not change because they are still registered in the tax registers under their names and thus have t to pay land tax. (Haldon, 1990, 125-127).

Tax and tax system

To best understand the tax system established by Emperor Diocletian, which was valid for the next couple of centuries, we need to explain the relationship between the head tax and the land tax, which are here combined into one tax. The system was known as capitatio-iugatio (human labor-cultivated agricultural land). Land is taxed if one iugum, in the cadastral unit corresponds to one caput or human labor force that can cultivate that iugum or taxable agricultural land. In the opposite sense, this would mean that the tax liability affects one caput only if he disposes of gum. In practice, the collection of taxes would have meaning at the conditions only if the specific taxable agricultural land corresponded to the distinctive agricultural producer or peasant who cultivates it. The effort of the financial administration of this era consisted of the intention to create a balance between the peasants who worked and the land that worked. To find someone who will cultivate it for each available agricultural land. It's was not an easy task because the late Roman era, during the transition from the ancient to the Middle Ages, was a labor shortage. The lack of labor has led to the need for financial reasons for increasingly large sections of the rural population to be tied to the land they cultivate. (Ostrogorski, 1969, 124-125).

The tax is collected mainly in money. Admittedly, there were cases where the tax was collected in the form of rent in kind. At the end of the 5th century, there were tendencies to switch to collecting taxes exclusively in money. At the end of the 5th century, there were tendencies to switch to collecting taxes exclusively in amounts of money. With the coming to power of Emperor Anastasius, a great reformer, administrator, and economist of his time policy fiscal was reformed. The emperor himself is the creator

of this reform. In this sense, in Jovan Malala's text, we have a record of his fiscal reform (part of the general restructuring of imperial finances), in which he insists on money and does not allow other means of payment. First of all, it means payments in kind. The emperor saw it as a conscious attempt to undermine the entire system (i.e. the existing practice), that is, the way of paying the military anyone. Malala says: "The most illustrious emperor Anastasius imposed on all landowners a tax paid in gold, based on the size of the holding, to prevent the soldiers from demanding payment in kind and using it for their own purposes." (Jeffreys, Jeffreys, Scott, & Croke, 1986, 221).

Anastasius adopts these measures to ensure the conditions in which local landowners could hand over the necessary supplies to the state, which were to be "purchased at fair prices, i.e. those valid in the province or city from which the goods are delivered." Such purchases would be credited to the taxpayers' accounts by, way of their gold debts. The sums of money to be collected were determined according to the market level of prices, which were valid at the local level.

Taxes were burdens and public obligations (munera). The landowners had to pay a tax on the land (tributum solis) but everyone in the countryside had to pay an individual tax, ributum capitis or capitation humane, which was a sum that was collected per capita (head tax) (JK 11,48,10). Justinian's Code (Corpus Iuris Civilis) of 529 AD (JK 11,48,20) states that taxes must be paid according to law, regardless of whether the colonists dispute that they are the owners of the land they cultivate. Therefore, the colonists were obliged to pay this tax or to directly hand over the income from the land to the tax collectors or the owner of the property, which they then forwarded to the central financial authorities. The method of tax collection indicated that, regardless of their independence as farmers, the colonists depended on the owner of the land they cultivated (JK 11,48,8), e.g., due to tax advances or otherwise. Article JK 11, 48, 8 also refers to colonists who leave the original owners and settle on other properties, where they rent out their labor force and thus income. They are allowed to return to the original landowner, but first, they must pay all their debts, i.e. Then, they have to pay the head tax themselves. If the owners knew that the colonists had escaped from other estates and continued to use their labor without payment, they had to pay the tax he owed for their labor. The first owner of the land did not have to do this the obligation passed to the second owner. The colonel was responsible for paying the head tax for himself and his family. Some of these texts date back to ago Justinian, but they were also applied during Justinian's reign. For the simple reason that they represented established practice. (Sirks, 2022, 129-147). The economic and social reality behind these rules is well described in Sarris's description of village life. (Sarris, 2009, 3-22).

Development of the tax system after the 7th century

Tax on agricultural land in the 6th century was still assessed based on the fugato-capitation ratio. It is supposed that the last mention of this type of taxation system is related to Sicily during the first years of the first reign of Emperor Justinian II (685-695). In this period, between then and the reign of the economist Niciphorus I (802-811), primarily changes took place in the taxation system. By this time, the tax was no longer based on a combined iugatio-capitatio assessment but on separate assessments,

the capnikon, household tax, sinon, or land tax. The first tax was, in fact, a tax on the land of adult household members, and the second was a tax on cultivated land. (Haldon, 1990, 141-142). Therefore, the tax is separate from the land tax. This separation of tax collection represents one of the fundamental changes in the Empire's tax system that took area in the early Middle Ages. In practice, this meant that the financial administration was no longer interested in tax-paying peasants linked to the land they cultivated. The era of the 7th and 8th centuries was characterized by fundamental changes in Byzantine society, which marked a kind of transition in property-land relations that led to the decline of the old landed aristocracy and the development of a new military nobility. In the period of early Byzantine feudalism, there was a strengthening of the provincial administration, and its measures led to the consolidation and strengthening of economic life. This transition period of Byzantine social structures is marked by an independent landowner who produces his lands for himself and pays taxes directly to the state. (Harvey, 2002, 14).

Table 1. Tax system

	The period from III to VI	The period from VII to IX
The majority group of the agrarian population	Colony	Free peasants
Tax on agricultural land	Head tax - land tax, one tax	Household tax and land tax, special taxes
Method of payment	Money and natural rent	Money
Billing time	Year	3 year

Source: author according to the given text.

As we mentioned, the most important tax, and therefore the main one was the land tax. This tax is paid by all owners who own land. This meant the practice that paying taxes was proof of ownership. From the beginning of the 8th century, perhaps even earlier, the value of the land began to be assessed for all those who owned it. The quality, but also the quantity, of the land that was taxed was assessed. (Treadgold, 1988, 38). The land had a fiscal value established by the financial service. Thus, one medium (which amounted to about 889 m2, slightly less than 1/10 of a hectare) of first-class land had the value of one gold coin (solid), the second class of land had the value of half a gold coin (semis), and the third class of land, which essentially represented pastures, it had a value of one-third of a gold coin (trims). The vineyards were worth much more. The tax was at 1/24 of this fiscal value. The possible share of taxes on annual grain production was about 23%. (Oikonomides, 2002, 1154). This type of tax depended on the cadastre, which was organized every thirty years. The village as a community was an important unit in the fiscal system. The land of each peasant household was registered, and the fiscal total value was taken as the basis for estimating the amount of money to be paid by the village, which was collectively responsible for paying taxes. (Laiou, & Morrisson, 2007, 52)

Table 2. Categorization of land taxes

Agricultural land	First class 1modij	Second class 1 modij	Third class 1 mode
Amount of tax to be collected	1 solid (gold coin)	½ semis gold coinyra	1/3 tremis gold coinp
Vineyards	1/24 of the fiscal value	-	-
Kapnikon - household tax	1/24 of the fiscal value	-	-

Source: author according to the given text.

The organization of the tax system was revised at the end of the 8th century by the competent financial service, which had its headquarters in Constantinople. Population and land registration was still done at the local level, as was the collection of taxes. The tax in this period was not excessively high. Tax payments in agriculture were clearly defined. Tax increases were not excessive, and the imperial administration's efforts were, to collect them more fairly. When collecting taxes, individual rural municipalities were represented by special fiscal units. The land and houses of all peasants were listed and recorded in the cadastre. At the end of every third year, the competent state authorities formed an amount that the peasants of that village had to pay collectively. If one of the peasants could not pay his share of the tax, his debt was paid by other peasants from the same village. (Simonović, 2012, 330).

In addition, have been collected other taxes. For example, there were taxes on domestic animals, bees, etc. This type of tax was relatively limited to collection and could pose a problem for an administration that collects tax in money within the fiscal system. Peasants were obliged to participate in public works. Those works were related to the defence and construction of roads construction of bridges, and fortifications. On the other hand, significant categories of the population enjoyed a limited exemption from paying taxes. In the first place, there were peasant households responsible for military service. They were peasant soldiers for the survival and expansion of the Byzantine state. The part of their land that was considered necessary for the performance of military duties was inalienable. They were also exempt from all other taxes and levies. Such peasant soldiers may have existed since the late 7th century. (Oikonomides, & Zachariadou, 2023, 20-29). The population was obliged to provide food, lodging, and transport animals to the Byzantine army and civil servants who were passing through. Finally, in addition to all this, there were other minor taxes and some kind of emergency levies. (Brand, 1969, 41).

The state also taxed trade transactions. The tax was called kommerkion, a term that appeared at the end of the 8th century, and it amounted, according to later sources, to 10% of the tax on trade transactions at fairs and markets. The commodities that came to Constantinople were all supplied to a particular trade zone. They existed a tax was collected at the entrance points, which were in Abydos and Hieron. (Oikonomides, 1997, 229). Unfortunately, it's not possible to determine the exact contribution of trade to the state revenues during this period.

In the 7th century, the state experienced a great crisis of wars, first with the Persian Empire, and then with the expansion of the Arabs, and the arrival of the Avars and the

Slavs. For these reasons, a part of the tax was collected in kind. There is evidence to suggest that in the 660s changes were made to the amount of the land tax. As confirmation for this claim, it has an example by the year 667 when a decision was made ordering the updating of the tax lists for the inhabitants of Calabria, Sicily, Sardinia, and Africa. The same decision ordered the registration of residents, who were obliged to provide and collect part of the income in kind. (Haldon, 1994, 135). It could have represented evidence that the same method of collecting land taxes was applied throughout the territory of the empire. The time when this order was passed coincided with the stay of Emperor Constans II (641-668) in Sicily, and it was probably passed due to the needs of the court and the army. (Ostrogorski, 1969, 136-137).

Evidence that taxes were collected in kind can be found in the Agricultural Law, which describes the institution of mortita. The mortit or tithe represented a relationship in which the one who cultivates the land gives the owner a tenth of the total nature. We know that at the time of the creation of the Agricultural Law. It was the state that gave the farmers land to cultivate and use. This means that the peasant paid mortit to the emperor, that is, to the state. The Mortites represent the tenants of the land. We can conclude that the aforementioned articles of the law regulate the obligation of farmers to fulfil the natural rent that appears here in the form of mortice under their responsibility. Natural rent consisted of the farmer paying the landowner (in our case, the country or the church) in products (in kind). (Simonović, 2007, 50). On this occasion, we do not want to enter into further controversy related to this law. We want to emphasize how tax collection is regulated.

Natural rent also consisted of the fact that the farmer paid the landowner (in our case country or the church) in products (in kind). (Simonović, 2007, 50). On this occasion, we do not want to enter into further controversy related to this law. We want to emphasize how regulated tax collection is in it.

Precisely in this period, when it is thought that the Agricultural Law was applied in the 7th or 8th century, the state began to insist more and more on paying taxes in money, especially in gold. In 769, Emperor Constantine V (741-775) ordered that the basic tax be paid, money. The consequence of this measure was the market, with a surplus of agricultural products, which caused great dissatisfaction among farmers. It is assumed that this reform was not comprehensive in the beginning. During, the years of its application, the tax was almost entirely collected in money, which happened until the 10th century at the latest. (Laiou, & Morrisson, 2007, 51-52). The measures led to a certain degree of presence of money in the countryside. Although the use of money arose as a consequence of fiscal needs, it was an important factor that in many ways led to the development of the village. (Haldon, 1990, 147-148). The increasing importance of the use of money in these times can perhaps best be seen by the example of Bulgaria, which was annexed to the Empire in 1018 and was allowed to pay taxes in the form of rent in kind. When the state was forced to change the method of payment from cash to cash, there was a rebellion in 1040/41. (Treadgold, 1997, 588) and (Burg, 2004, 75-76).

The tax system established in this way changed during the 10th and 11th centuries. In this period, the territorial expansion of the Empire takes place. The state had expenses that arose as a result of financing the war. All this leads to an inevitable increase in taxes on agriculture, which are often collected by violent methods. These tax increases were often accompanied by arbitrary taxation. (Oikonomides, 1996, 146-147). This situation

on the ground led to the collapse of the existing taxation system. In the end, it changed in the first half of the 11th century.

Conclusion

In the interval from the end of the 3rd to the beginning of the 9th century, the state and society of the Empire went through two transitional periods, which spanned almost five hundred years. In the first period, which began at the end of the 3rd century and lasted until the beginning of the 7th century, agricultural production was dependent on the relationship between large landowners and colonists. Central authorities tended to collect taxes in money during this period. In the second period, which started from the beginning of the 7th century and lasted until the middle of the 10th century, agricultural production was based mainly on a larger number of free peasants. In the first time, the tax was collected in a combination of kind and money. So, in the second period, the dominant method of tax collection was again in money.

The existence of two different tax collection systems is also a characteristic of this period that we are talking about in the paper. In the first period, the taxes were collected in the combined ratio of head tax and land tax, and in the second period, the tax was separated into household tax and land tax.

The contribution of this work is reflected in the review and analysis related to the organization of agricultural production in the critical period of the early Byzantine Empire, as well as how taxes were collected. It points to the fact that the early Byzantine society of this time was changing and becoming more and more class-based, these changes also affected the way and procedure of tax collection. The Codex of Justinian and the texts of Procopius as sources of this time, as well as the Agricultural Law, but contemporary relevant literature that has been interpreted differently give us a completely new insight into the state of affairs of that time. We believe that the text of this paper confirms this.

From all of the above, we can conclude that the state apparatus of the Empire showed endurance and resilience, especially in times when the territory of the state began to shrink. In the Arab conquests that began in the middle of the 7th century, the rich provinces of Egypt and Syria were lost. This caused entire sections of the population to remain living outside the borders of the Empire. The structure of the state organization was changing and adapting to the new situation. The population that remained part of the Empire also had to adapt to the changes. The tax system and the method of collection tax were reorganized and adapted to the new size of the state. All this enabled the country to continue its survival in the following centuries.

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ANALYSIS OF POSSIBLE IMPACT FACTORS ON THE DEVELOPMENT OF THE ENTREPRENEURIAL INITIATIVE

Abstract

The evolution of entrepreneurial initiatives is a intricate process shaped by a multitude of factors. These factors span diverse dimensions, including the socio-economic setting, educational programs, individual characteristics, and the entrepreneurial ecosystem. Entrepreneurial initiative encompasses the proactive and innovative pursuit of opportunities, reflecting an individual or a group's willingness to take risks and create value in various domains. Rooted in the entrepreneurial spirit, this initiative goes beyond conventional business ventures, extending to the realms of social, technological, and cultural innovation. Individuals who possess entrepreneurial initiative frequently display attributes like inventiveness, flexibility, and a readiness to take measured risks. Determining the factors that lead to the growth of entrepreneurial initiative can help investors, entrepreneurs, and policy makers create an environment that is conducive to innovation and expansion in the entrepreneurial sector. The aim of this paper is to determine the factors that are most important for the development of entrepreneurial initiatives, as well to clarify the potential effects that various factors can have on the evolution of entrepreneurial initiatives, providing a nuanced perspective rooted in current literature.

Keywords: *entrepreneur, entrepreneurial initiative, factors, development*

JEL classification**: **L26

АНАЛИЗА МОГУЋИХ ФАКТОРА УТИЦАЈА НА РАЗВОЈ ПРЕДУЗЕТНИЧКЕ ИНИЦИЈАТИВЕ АПСТРАКТ

Еволуција предузетничких иницијатива је сложен процес обликован мноштвом фактора. Ови фактори обухватају различите димензије, укључујући

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социо-економско окружење, образовне програме, индивидуалне карактеристике и предузетнички екосистем. Предузетничка иницијатива обухвата проактивно и иновативно тражење могућности, одражавајући спремност појединца или групе да преузме ризик и створи вредност у различитим доменима. Укорењена у предузетничком духу, ова иницијатива превазилази конвенционалне пословне подухвате, проширујући се на области друштвених, технолошких и културних иновација. Појединци који поседују предузетничку иницијативу често показују атрибуте као што су инвентивност, флексибилност и спремност да преузму мерене ризике. Утврђивање фактора који доводе до раста предузетничке иницијативе може помоћи инвеститорима, предузетницима и креаторима политике да створе окружење које је погодно за иновације и експанзију у предузетничком сектору. Циљ овог рада је да одреди факторе који су најзначајнији за развој предузетничке иницијативе, као и да разјасни потенцијалне ефекте које различити фактори могу имати на еволуцију предузетничких иницијатива, пружајући нијансирану перспективу укорењену у актуелној литератури.

Кључне речи: *предузетник, предузетничка иницијатива, фактори, развој*

Introduction

In today's dynamic and interconnected world, entrepreneurial initiative extends beyond traditional business contexts. It involves recognizing opportunities for innovation in diverse fields, including technology, healthcare, education, and social enterprises. Whether launching a startup, introducing a novel product, or addressing a societal challenge, the essence of entrepreneurial initiative lies in the proactive pursuit of opportunities and the commitment to making a positive impact.

Entrepreneurial initiative holds significance not only for individuals and businesses but also for society at large. It drives economic development, fosters job creation, and encourages a culture of innovation. Policymakers, educators, and organizations increasingly recognize the value of cultivating entrepreneurial initiative to spur growth and address complex challenges.

The development of entrepreneurial initiative is influenced by a combination of factors. The socio-economic environment, educational background, personal traits, and the broader entrepreneurial ecosystem all play crucial roles in shaping and nurturing this entrepreneurial mindset. Individuals with entrepreneurial initiative often exhibit traits such as creativity, adaptability, and a willingness to embrace calculated risks.

Research into the factors influencing the development of entrepreneurial initiatives has attracted considerable scholarly attention, acknowledging the intricate interplay among individual characteristics, socio-cultural contexts, and broader environmental influences.

With the development of entrepreneurship, many authors pay increasing attention to understanding the possible influences that shape the development of entrepreneurial initiatives, facilitating the formulation of informed strategies and interventions for entrepreneurial growth. The evolution of entrepreneurial initiatives is shaped by a

multitude of factors, as indicated by various research endeavors. Silveira et al. (2017) identified seven key factors through factor analysis, including cultural influence, personal attributes, and entrepreneurial education. Pesha (2022) emphasized the creation of an entrepreneurial climate and organizational policies to encourage entrepreneurial thinking. The complex and multifaceted nature of entrepreneurship was highlighted by Ferreira-Neto et al. (2023). Using Ajzen's Theory of Planned Behavior as a framework, Pita et al. (2021) highlighted the significance of exogenous factors and their indirect effects on entrepreneurial behavior. Praswati et al. (2022) creatively included in their analytical framework both external environmental factors and internal personal factors. Factor analysis was used by Shabnaz & Islam (2021) to determine the factors that have an impact on entrepreneurial intention, and regression analysis was utilized to forecast the significant impact factors. Furthermore, a meta-analysis was carried out by Vidyatmoko & Hastuti (2017) in order to create an analytical framework for the variables affecting entrepreneurs' success. Individual opportunities are increased by the factors that Machado et al. (2016) presented as amplifying the effects of entrepreneurial alertness.

All of these studies show how complex the development of entrepreneurial initiatives is, and how it is impacted by organizational, individual, cultural, and educational factors. These elements work together to shape the entrepreneurial environment, which emphasizes the need for a complete understanding of the various elements affecting entrepreneurial endeavors.

The impact of institutional and social factors on the growth of entrepreneurial endeavors

The development of entrepreneurial initiatives is significantly influenced by social and institutional conditions, as evidenced by a body of research. Kumar & Borbora (2019) demonstrate the differential influence of the local institutional environment on entrepreneurial activities at a regional level in a developing economy like India. This highlights the importance of considering the specific institutional context in shaping entrepreneurial endeavors. Furthermore, Welter (2011) emphasizes the significance of historical, temporal, institutional, spatial, and social contexts in understanding economic behavior and entrepreneurial actions. This underscores the multifaceted nature of contextual influences on entrepreneurship.

Institutional factors, including government actions and societal norms, play a crucial role in impacting entrepreneurial efforts, as discussed by Bruton et al., (2010). The authors highlight the direct role of governments in creating a supportive environment for entrepreneurship and the influence of societal norms. Nsereko (2020) also emphasizes the influence of country-specific factors such as culture and institutional context on social entrepreneurial intent and conditional resources, further underlining the impact of social and institutional conditions on entrepreneurial outcomes.

The institutional perspective on entrepreneurial behavior is further illuminated by Su et al., (2019), who emphasize the fading recognition of the social and institutional impact on entrepreneurial behavior in modern society. This highlights the evolving nature of social and institutional influences on entrepreneurship. Additionally, García-Ramos et al. (2017) analyze the influence of the institutional environment on entrepreneurial failure,

considering both formal and informal characteristics, such as regulatory complexity, tax pressure, and social capital. This underscores the diverse ways in which institutional factors can shape entrepreneurial outcomes.

Moreover, Wu et al. (2023) draw on the institutional logics perspective to construct a theoretical model of social entrepreneurial passion and competence affecting social enterprise performance through organizational legitimacy, highlighting the mediating role of institutional factors. Adomako et al. (2015) also emphasize the influence of the social and informal institutional context on entrepreneurial processes in less developed market economy settings. This further emphasizes the importance of considering social and informal institutional contexts in understanding the entrepreneurial climate.

In conclusion, the influence of social and institutional conditions on the development of entrepreneurial initiatives is multifaceted and complex, encompassing historical, spatial, cultural, and regulatory dimensions. Understanding and accounting for these influences are essential for fostering a conducive environment for entrepreneurial activities.

Economic factors

Economic factors play a crucial role in shaping the development of entrepreneurial initiatives. The impact of entrepreneurship on economic growth and development varies across different income levels and regions. In high-income countries, entrepreneurial attitudes stimulate GDP per capita, while in middle/low-income economies, entrepreneurial activity may have a negative effect (Doran et al., 2018). Furthermore, the presence of an entrepreneurial environment conducive to sustaining a healthy economy is a key factor in rural economic development (Shava & Maramura, 2017). Economic factors such as access to credit, availability of market information, and technology significantly influence entrepreneurial engagement, particularly among university students (Muithui et al., 2023). Additionally, the development of the financial market and market size has a positive impact on entrepreneurship in factor-driven countries (Rostami et al., 2019).

Moreover, the nexus between entrepreneurship and economic growth has been extensively studied, with findings indicating a negative effect of entrepreneurship on regional development in developing countries, possibly due to the imperfection of public institutions in these countries (Stoica et al., 2020). It has also been highlighted that the impact of entrepreneurship on economic development depends on the differential allocation of entrepreneurship in productive, non-productive, and destructive activities (Li & Zhang, 2021). Furthermore, the study emphasizes that the existing and new potential for innovative entrepreneurship is one of the driving forces of economic development, particularly in Eastern Europe (Iaroslav et al., 2020).

In addition, the economic dynamics may stimulate female entrepreneurship in different ways, as women tend to become more entrepreneurial in times of crisis, driven by necessity factors (Gaweł & Głodowska, 2021). Furthermore, the role and characteristics of entrepreneurial activities in all stages of economic development are identical, but different types and phases of entrepreneurship may affect economic growth differently in different parts of the world (Leković et al., 2014).

Economic factors such as market conditions, access to credit, and economic development levels significantly influence the development of entrepreneurial initiatives.

The interplay between entrepreneurship and economic growth is complex and varies across different income levels and regions, highlighting the need for tailored strategies to foster entrepreneurial development in diverse economic contexts.

Factors related to innovation's impact on the emergence of entrepreneurial initiative

The development of entrepreneurial initiatives is significantly influenced by various innovation factors. Entrepreneurial intention among undergraduate students is found to be causally related to innovativeness, highlighting the importance of fostering an innovative mindset for entrepreneurial development (Wathanakom et al. 2020). Additionally, entrepreneurial activities significantly promote economic development, emphasizing the crucial role of innovative entrepreneurial potential, particularly among college students (Lv et al., 2021). Furthermore, the development of entrepreneurial skills is identified as a critical factor facilitating the survival and continued innovativeness of entrepreneurs in dynamic and technologically saturated environments (Ndovela & Chinyamurindi, 2021).

Environmental conditions and entrepreneurial orientation are shown to influence innovation, indicating the interplay between external factors and entrepreneurial innovation (Fachrozie et al., 2022). The entrepreneurial ecosystem is highlighted as a significant influence on the initiation and development of innovations, underscoring its importance in fostering entrepreneurial growth and economic development (Raut et al., 2022). Moreover, individual orientation, belief in entrepreneurship, and perceived entrepreneurial capability are identified as crucial factors contributing to entrepreneurial innovation among international students (Shwedeh et al., 2023).

In the corporate context, innovation is recognized as a common theme underlying all forms of corporate entrepreneurship, emphasizing its central role in driving entrepreneurial activities within organizations (Covin & Miles, 1999). Perceived university support is found to exert a significant influence on entrepreneurial self-efficacy, highlighting the importance of institutional support in fostering entrepreneurial innovation (Saeed et al., 2013). Additionally, attitude toward entrepreneurship and self-efficacy are identified as crucial factors influencing entrepreneurial intentions, underscoring the psychological aspects of entrepreneurial development (Al.badi et al., 2021).

Innovation ecosystems are shown to influence the importance and impact of self-regulation in entrepreneurial settings, emphasizing the contextual characteristics that shape entrepreneurial innovation (Nambisan & Baron, 2013). Furthermore, the role of universities in developing entrepreneurial capital and fostering collaborative relationships with companies is highlighted as a fundamental dimension in innovation ecosystems (Schiuma & Carlucci, 2018). Entrepreneurial potential and orientation are positively related to innovativeness, indicating the intrinsic link between entrepreneurial traits and innovative behavior (Subotić et al., 2018).

In the educational context, innovation and entrepreneurship education are identified as important drivers of economic development, particularly in rapidly growing economies (Zheng, 2022). The integration of innovation and entrepreneurship education in higher education is recognized as a national strategic priority, reflecting the increasing emphasis

on fostering entrepreneurial and innovative capabilities among students (Lv et al., 2022). Moreover, the exploration of entrepreneurial orientation, opportunity recognition, and entrepreneurial bricolage is shown to drive business model innovation, highlighting the dynamic nature of entrepreneurial innovation processes (Guo et al., 2015).

Influence of innovation factors on the development of entrepreneurial initiatives is multifaceted, encompassing psychological, institutional, and contextual dimensions. Fostering an innovative mindset, institutional support, and educational initiatives are crucial in nurturing entrepreneurial innovation and driving economic development.

The impact of entrepreneurs' individual traits on the growth of their entrepreneurial initiative

The development of entrepreneurial initiative is influenced by various personal characteristics of entrepreneurs. Research has shown that personality dimensions such as self-efficacy, need for achievement, and entrepreneurial orientation are highly associated with entrepreneurship (Fresé & Gielnik, 2014). Additionally, the effect of personality traits such as consistency, determination, risk-taking, and tolerance leads to entrepreneurial intentions among young entrepreneurs (Cao et al., 2022). Furthermore, the study by provides empirical evidence on the relationship between entrepreneurial alertness, personal initiative, and social entrepreneurial venture creation, emphasizing the role of personal initiative in entrepreneurial activities (Nsereko et al., 2021). Moreover, the influence of personal characteristics on entrepreneurial willingness has been highlighted, indicating that the acquisition of entrepreneurial resources has a significant positive impact, while the cooperation ability of entrepreneurs' personal characteristics plays a significant regulatory role (Xu et al., 2020). Additionally, the assessment and measurement of entrepreneurial traits provide a basis for entrepreneurial level and personal development planning, emphasizing the importance of understanding individual characteristics for entrepreneurial success (Ismail et al., 2018).

The impact of personality traits on entrepreneurial intentions and the success of entrepreneurial activities has been emphasized in various studies. For instance, the study highlights that knowledge, skills, and attitudes are main characteristics of potential entrepreneurs, indicating the significance of personal traits in entrepreneurial endeavors (Majková & Ključnikov, 2017). Additionally, the study emphasizes the importance of self-confidence, initiative, dynamism, leadership, perseverance, creativity, energy, receptivity, and ability to get along with other people as characteristic attributes of entrepreneurs (Schneider, 2017).

The impact of an entrepreneur's personal traits on the emergence of their entrepreneurial initiative is a complex and vital component of entrepreneurship. In order to promote entrepreneurial development and initiatives, it is crucial to comprehend how personality qualities, self-efficacy, perseverance, and risk-taking affect entrepreneurial objectives and success.

Theoretical research model

The model consists of 3 independent variables: A, B and C and 1 dependent variable D, as shown in Figure 1.

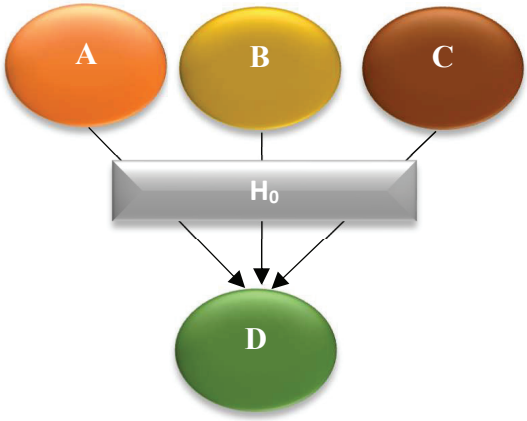

Figure 1. Theoretical research model

The independent variable A has its own assertions, namely:

- a1 – Self-efficacy affects the development of entrepreneurial initiative
- a2 - The need for achievement affects the development of entrepreneurial initiative
- a3 – Entrepreneurial orientation affects the development of entrepreneurial initiative

The independent variable B has its own assertions, namely:

- b1 - Social capital affects the development of entrepreneurial initiative
- b2 – Tax pressures affect the development of entrepreneurial initiative
- b3 – Regulatory complexity affects the development of entrepreneurial initiative

The independent variable C has its own assertions:

- c1 - Access to loans affects the development of entrepreneurial initiative
- c2 - The availability of market information affects the development of entrepreneurial initiative
- c3 – Technologies influence the development of entrepreneurial initiative

Dependent variable D has its own claims:

- d1 – Personal characteristics influence innovation
- d2 - Institutional and social factors influence innovation
- d3 – Economic factors influence innovation

Research task

Determine whether levels: A, B and C collectively affect level D?

Hypothesis in research

H0: Levels: A, B and C, do not affect level D.
Ha: Levels A, B and C affect level D.

Descriptive statistics

In Table 1. descriptive statistics are given for the statements made. Statement c1 has the highest mean value and is 4.505102, and statement b2 has the lowest mean value and is 3.869898.

Table 1. Descriptive statistics for the statements made

Claim	a_1	a_2	a_3	b_1	b_2	b_3
Mean	4.4719388	4.3596939	4.3341837	4.3647959	3.869898	4.3010204
Std Dev	0.5890982	0.6199644	0.5475403	0.7095155	0.5548318	0.6162331
Std Err Mean	0.029754	0.0313129	0.027655	0.0358359	0.0280232	0.0311245
Variance	0.3470366	0.3843559	0.2998004	0.5034122	0.3078384	0.3797432
Skewness	-0.607566	-0.425162	-0.299906	-0.874039	-0.047525	-0.294169
Kurtosis	-0.576997	-0.659	0.9979765	0.277751	0.074253	-0.640474
N	392	392	392	392	392	392
Claim	c_1	c_2	c_3	d_1	d_2	d_3
Mean	4.505102	4.1122449	4.3852041	3.9540816	4.1479592	4.3341837
Std Dev	0.5585646	0.5700568	0.6609963	0.5036274	0.5433117	0.5475403
Std Err Mean	0.0282118	0.0287922	0.0333854	0.025437	0.0274414	0.027655
Variance	0.3119944	0.3249648	0.4369161	0.2536406	0.2951876	0.2998004
Skewness	-0.551208	-0.157367	-0.772834	-0.811009	0.088136	-0.299906
Kurtosis	-0.748815	0.7008532	0.2155474	3.5708099	0.1182309	0.9979765
N	392	392	392	392	392	392

Multiple correlation and regression analysis

In Table 2. the basic evaluation of the model was performed. The coefficient of multiple determination is 0.772102, which means that with 77.21% of the variability, the dependent variable D can be explained by the independent variables: A, B and C. The coefficient of multiple correlation is 0.87869 and it is positively strong.

Table 2. Evaluation of the model

RSquare	0.772102
RSquare Adj	0.77034
Root Mean Square Error	0.199591
Mean of Response	4.145408
Observations (or Sum Wgts)	392

The assessment of statistical significance is given in Table 3. and it amounts to [F (3,388) = 438.1729, p<0.0001].

Table 3. ANOVA

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	3	52.366180	17.4554	438.1729
Error	388	15.456666	0.0398	**Prob > F**
C. Total	391	67.822846		<0.0001

In Table 4. the size of the contribution of independent variables to dependent variable D is determined. The highest contribution has independent variable A and it amounts to 0.57079, then variable C and it amounts to 0.297975, and the smallest contribution has independent variable B and it amounts to 0.218092. Based on these data, the proposed alternative hypothesis Ha is accepted: Levels A, B and C affect level D.

Table 4. Contribution coefficients

Term	Estimate	Std Error	t Ratio	Prob>|t|	Std Beta	VIF
Intercept	-0.101242	0.119561	-0.85	0.3976	0	.
A	0.5204411	0.026276	19.81	<0.0001	0.57079	1.4139173
B	0.180869	0.022377	8.08	<0.0001	0.218092	1.2394874
C	0.2784528	0.028716	9.70	<0.0001	0.297975	1.6076404

Based on the data from the previous table, a multiple regression equation (formula 1 and 2) can be formed, which reads:

$$y = -0.101242 + 0{,}5204411 \cdot x_1 + 0{,}180869 \cdot x_2 + 0{,}2784528 \cdot x_3 \quad (1)$$

Or:

$$D = -0.101242 + 0.5204411 \cdot A + 0.180869 \cdot B + 0.2784528 \cdot C \quad (2)$$

Figure 2. shows the diagram of the multiple regression equation for variable D.

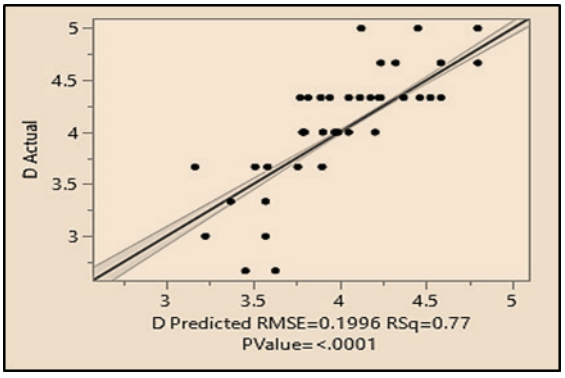

Figure 2. Plot of multiple regression equation for variable D

It can be concluded that levels A, B and C affect level D.

Conclusion

Entrepreneurial initiative embodies the proactive and innovative spirit that drives individuals and groups to identify, pursue, and create opportunities in various domains. It reflects a mindset that goes beyond traditional business ventures, embracing a holistic approach to problem-solving and value creation. As the entrepreneurial landscape continues to evolve, fostering and supporting entrepreneurial initiative remains integral to driving positive change and shaping a resilient and innovative future.

The personal characteristics of entrepreneurs have a significant impact on the development of entrepreneurial initiative. Research has consistently demonstrated the influence of personality traits such as self-efficacy, determination, risk-taking, and entrepreneurial orientation on entrepreneurial intentions and success. Additionally, the acquisition of entrepreneurial resources and the cooperation ability of entrepreneurs' personal characteristics play crucial roles in fostering entrepreneurial willingness and initiative. Understanding and assessing entrepreneurial traits provide a basis for entrepreneurial level and personal development planning, emphasizing the importance of individual characteristics for entrepreneurial success.

Furthermore, the influence of personality traits on entrepreneurial intentions and the success of entrepreneurial activities has been emphasized in various studies. For instance, the study by highlights the significance of knowledge, skills, and attitudes as main characteristics of potential entrepreneurs, indicating the importance of personal traits in entrepreneurial endeavors. Additionally, the study by emphasizes the importance of self-confidence, initiative, dynamism, leadership, perseverance, creativity, energy, receptivity, and ability to get along with other people as characteristic attributes of entrepreneurs. The impact of personal characteristics on the development of entrepreneurial initiative is a multifaceted and crucial aspect of entrepreneurship. Understanding the influence of personality traits, self-efficacy, determination, and risk-taking on entrepreneurial intentions and success is essential for fostering entrepreneurial development and initiatives.

The potential impact on the development of entrepreneurship initiatives is a multifaceted interplay of economic, technological, and sociocultural factors. The examination of market trends, financial accessibility, technological advancements, and societal values highlights the intricate dynamics that shape the entrepreneurial landscape. Economic conditions emerge as pivotal determinants, influencing the success or challenges faced by entrepreneurs. Meanwhile, technological progress not only introduces new opportunities but also shapes the very fabric of entrepreneurial endeavors. Sociocultural influences underscore the importance of aligning entrepreneurial activities with prevailing values and perceptions. Recognizing the interconnected nature of these elements is crucial for fostering effective entrepreneurship development. A comprehensive understanding of these dynamics is essential for policymakers, investors, and entrepreneurs, enabling them to navigate challenges and capitalize on opportunities. Ultimately, by addressing these influences, we can collectively contribute to the creation of an environment conducive to sustained entrepreneurial growth and innovation.

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EXPLORING THE LEGAL FRAMEWORK OF GENETICALLY MODIFIED ORGANISMS IN THE WESTERN BALKANS

Abstract

In the Western Balkans, comprising Albania, Bosnia and Herzegovina, North Macedonia, Montenegro, Serbia, and Kosovo[3], there exists a diversity of perspectives on the matter of genetically modified organisms (GMOs) and their associated politics. Given the growing significance of this issue and the ongoing discourse within the EU regarding new genomic techniques (NGTs), the primary objective of this paper is to assess the prevailing regulatory landscape within the region. The findings underscore the vital need for a harmonized regulatory framework concerning NGTs among countries in the same geographical vicinity. The absence of such coherence could potentially cast doubt on the viability of the Open Balkan initiative. This article thus serves as a foundational resource for governments, scholars, and policymakers engaged in the formulation of GMO-related policies, fostering a comprehensive understanding of the regional dynamics and facilitating informed decision-making.*

Keywords: GMOs, gene editing, law, Western Balkans, Open Balkan initiatives

JEL classification: *F50, F68, Q18.*

ИСТРАЖИВАЊЕ ПРАВНОГ ОКВИРА ГЕНЕТСКИ МОДИФИКОВАНИХ ОРГАНИЗАМА НА ЗАПАДНОМ БАЛКАНУ

Апстракт

На западном Балкану, који обухвата Албанију, Босну и Херцеговину, Северну Македонију, Црну Гору, Србију и Косово, постоје различита гледишта по питању генетски модификованих организама (ГМО) и њихове политике. С обзиром на све већи значај овог питања и текући дискурс унутар ЕУ у вези са новим геномским техникама (НГТ), примарни циљ овог рада је да процени преовлађујући регулаторни пејзаж у региону. Закључци подвлаче виталну потребу за хармонизованим регулаторним оквиром који се тиче НГТ-а међу*

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земљама у истој географској близини. Одсуство такве кохерентности могло би потенцијално довести у сумњу одрживост иницијативе Отворени Балкан. Овај рад стога служи као темељни ресурс за владе, научнике и креаторе који се баве формулисањем политика у вези са ГМО, подстичући свеобухватно разумевање регионалне динамике и омогућавајући информисано доношење одлука.

Кључне речи: ГМО, уређивање гена, право, Западни Балкан, иницијатива Отворени Балкан

Introduction

National approaches to the regulation of genetically modified organisms (GMOs) vary significantly among countries, yet they tend to align with two predominant regulatory models. Europe, for instance, has invested considerable time and effort into establishing a comprehensive regulatory framework, which it has successfully shared as a standard for precautionary regulation worldwide. Conversely, the United States (US) has pursued a policy that treats genetically modified and conventional foods as essentially indistinguishable (Gaskell et al., 1999; Runge et al., 2001). As a result, countries with strong economic ties to the European Union (EU) often harmonize their national regulations with EU recommendations, while those closely linked to the US tend to adopt a regulatory framework similar to that of the US.

After decades of implementing precautionary regulations, it appears that the EU has decided to significantly reduce them and bridge the gap between its regulations and those of the US. The reason for closing the gap between the two superpowers is the emergence of new genomic techniques (NGTs), also known as new breeding techniques (NBTs). After the release of the statement titled 'A Scientific Perspective on the Regulatory Status of Products Derived from Gene Editing and Its Implications for the GMO Directive' by the Scientific Advice Mechanism in November 2018 (Group of Chief Scientific Advisors, 2018), the European Commission initiated research studies conducted by the Joint Research Centre (JRC) (Broothaerts et al., 2021). Building upon the findings of this study, the European Commission (EC) requested the initiation of a European initiative aimed at revising regulations pertaining to certain NGTs. A reform proposal comprises three levels of regulation: Tier 1 - For GM plants that only require a pre-market notification for introduction to the market as such or in products; Tier 2 - For GM plants, a case-by-case decision will determine whether GMO authorization is required; Tier 3 - Transgenic GM plants will always necessitate GMO authorization (Voigt, 2023). The new regulation categorizes Tier 1 as equivalent to conventional plants, providing an explanation that plants obtained through laboratory manipulation using NGTs could also potentially arise naturally or be the result of traditional breeding processes, without the introduction of foreign DNA into the gene pool. For Tier 2, the evaluation will center on the altered trait. To determine if GMO authorization is required (through risk screening), the notifier will provide information for authorities to assess potential risks to human health or the environment associated with the GM plant or its derived products. Tier 3 comprises transgenic plants obtained through traditional genetic engineering methods.

The proposal has stirred not only differences among EU ministers but has also sparked debate among associations and the general public. At the inaugural discussion regarding new genomic techniques held at the close of July 2023, Spain, presently presiding over the EU Agriculture Council, along with the Italian and French ministers, greeted the proposal as a substantial and eagerly anticipated advancement. Nonetheless, there was significant criticism from representatives of Hungary and Austria, who underscored the significance of maintaining GMO-free farming practices. The initial meeting indicated that Germany, Cyprus, Luxembourg, and Lithuania could act as intermediaries between strong proponents and opponents of NGTs (Euroaktiv, 2023). The dissatisfaction with the proposed reform among European regions without GMOs, specific stakeholder groups, farmers, and researchers became particularly prominent at the 10th GMO Free Europe Conference held in Brussels on September 6-7, 2023 (GMO free Europe, 2023). The most significant argument put forth by critics was that 94% of all new GM plants already on the market and/or in commercial development fall into Tier 1, the category for which the EC proposes complete deregulation, effectively implying full openness to NGTs in Europe (Brankov, 2023).

As countries in the Western Balkans navigate their position between two influential global powers, they are in the process of developing their own distinct GMO legislation. As an illustration, Albania, which received substantial assistance from the US during its transformation from one of Europe's most secluded and authoritarian communist regimes into a democratic nation with a market-driven economy (USAID, 2023), has embraced the principle of substantial equivalence. In contrast, Serbia, where a minimum of four distinct forces - the EU, the US, Russia, and China - are vying for influence (European Parliament, 2017), has implemented more rigorous protective standards that surpass the requirements of EU legislation.The other countries in the region find themselves somewhere along this spectrum, adjusting their GMO regulations accordingly (Brankov et al., 2022). In the near future, Western Balkan countries will face an important decision - whether to implement deregulation of new NGTs or to include NGTs within existing GMO regulations.

Considering the influence of the GMO regulations on market and the dynamics of international trade (Perdikis et al., 2004), this paper's central objective is to evaluate the existing legal framework governing GMOs in the Western Balkans. Subsequently, it aims to project the potential future legislation concerning NGTs in the region.

The structure of this paper unfolds as follows: Section 2 delineates the research methodologies and data sources utilized in this study. In Section 3, we present the findings, encapsulated as "Variations in GMO Regulations across Western Balkan Nations." Section 4 delves into a comprehensive discussion of the findings, while Section 5 concludes with a succinct summary of the results.

Methods and Data

To facilitate a profound comprehension of legal frameworks, pinpoint vital components, and delve into their core, this paper adopts a qualitative approach in scrutinizing legislation across six countries/territories in the Western Balkan region: Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, Serbia, and Kosovo*.

In addition to textual and comparative analyses, a contextual analysis approach was employed. This was deemed essential as it allows for a comprehensive understanding of the factors that influenced the formulation and implementation of laws, including their historical, political, and social contexts.

Our study integrates information derived from official national legal documents, complemented by reports sourced from the Foreign Agricultural Service (FAS) within the United States Department of Agriculture (USDA) - specifically, the GAIN reports. Additionally, we drew upon agricultural data provided by Agricultural Policy Plus, an online platform that serves as a communication hub in the realm of agriculture and rural development for the South Eastern European countries.

Variations in GMO Regulations across Western Balkan Nations

Albania lacks specific legislation dedicated solely to GMOs, instead addressing them through a broader interpretation of various existing laws (Jaupi et al., 2014). Currently, GMO products in Albania are subject to several key regulations (Table 1), including the_Food Law (2008, last amended 2022) that serves as a primary legal framework addressing the regulation of GMOs in food and feed products. However, it approaches GMO food and feed in a broad and nearly equivalent manner to non-GMO products. It delegates the responsibility for developing specific regulations related to risk assessment and risk management to the Ministry of Agriculture through subsequent by-laws. However, despite the passage of sixteen years since the adoption of the Food Law, there has been no advancement in GMO-related legislation (EC, 2022).

The existing legislation in Albania lacks clarity when it comes to whether the introduction of GMO products into the market requires prior assessment and authorization, and this process remains undefined. While the Food Law mandates the labeling of GM food and feed products, it does not specify whether this should be based on the detectability of genetically modified DNA or protein in the final products, nor does it establish trace thresholds for the inevitable presence of GM material in food or feed. To address these gaps, Albania should establish an effective traceability system for products containing or derived from GMOs that have been authorized for market placement. Additionally, the country has not yet defined requirements for testing and validation methods to detect GMOs, which is a crucial aspect of the approval process. Regarding the release of GMOs into the environment and ensuring coexistence, Albania needs to make significant efforts in developing appropriate legislative measures and enhancing institutional capacities. It is essential to clarify the roles and responsibilities of various institutions involved in handling and overseeing GMO-related issues. Strengthening the professional skills and technical capabilities of these responsible institutions is paramount, and this may involve establishing reference laboratories and providing comprehensive staff training. Furthermore, fostering public participation and facilitating information sharing is equally vital for the effective management of GMO-related matters (Jaupi et al., 2014).

As a consequence, the status regarding the import of genetically engineered products remains uncontrolled. The country allows imports GM food or feed upon authorization (FAO, 2018). It is probable GM food or feed has been regularly imported

into the country, especially animal feed because Albania is a significant importer of protein meals used in animal feed, and roughly 90 percent of the global soybean supply is genetically engineered. Since soybeans are not cultivated locally, Albania relies entirely on imports for soy-related products (International Trade Administration, 2021). For instance, in 2014, Albania imported animal feed valued at $239,000 from the United States (GAIN, 2015).

Bosnia and Herzegovina instituted a GMO ban under the Food Law in 2004. This moratorium remained in effect for five years until the enactment of the Law on GMOs ("The Official Gazette of B&H" No. 23/09) and the subsequent implementation of regulations (FAO, 2023), as detailed in Table 1.

The enactment of the Law on GMOs and the subsequent Rulebooks in Bosnia and Herzegovina aligns with pertinent EU legislation. While these regulations technically allow for the authorized use of genetically engineered products, the process of adopting the implementing bylaws spanned several years. It wasn't until August 2015 that the Bosnia and Herzegovina Food Safety Agency issued the first permits for the import and marketing of GMO feed. Prior to this, much like Albania, it's likely that GM feed was regularly imported into the country, as Bosnian and Herzegovinian farmers heavily rely on such imports for livestock feed.

Currently, in Bosnia and Herzegovina, GM soybeans have received approval and have been introduced into the market for a period of five years, exclusively for use as animal feed. These soybeans are identified by various unique codes corresponding to different types (MON-Ø4Ø32-6, ACS-GMØØ6-4, MON-877Ø1-2, MON-89788-1, MON-877Ø1-2 x MON-89788-1, DAS-81419-2, MON-877Ø8-9, MON-87751-7, DAS-444Ø6-6) (FAO, 2023). It's important to note that Bosnia and Herzegovina does not domestically produce any GM food or feed. The country does not actively monitor the Low-Level Presence/Adventitious Presence (LLP/AP) situation and does not conduct safety assessments of GM food. Nevertheless, it enforces mandatory labeling regulations for GM food, clearly indicating the presence of GMOs.

The Law prohibits the cultivation of crops developed through modern biotechnology in specific areas, including nature-protected zones, ecological regions, areas designated for organic farming, and those designated for eco-tourism. Furthermore, it restricts the planting of genetically engineered crops for reproductive purposes to areas approved by the Council of Ministers, following recommendations from the Food Safety Agency (FSA). When the provisions of the GMOs Law cannot be applied, the regulations outlined in the Food Law and its associated bylaws will come into effect.

Bosnia and Herzegovina, in collaboration with the "Danube Soya Initiative" and with the backing of the Austrian Federal Environment Agency and the German Organization for International Cooperation (GIZ), has established a voluntary standard for "GMO-free" products. This standard applies to products of both plant and animal origin, and it requires that these products be manufactured using raw materials and additives that are neither genetically engineered nor derived from genetically engineered sources. Currently, the only products certified as "GMO-free" in Bosnia and Herzegovina are table eggs and vegetable oils (GAIN, 2022).

In 2008, **North Macedonia** introduced the Law on GMOs, under the auspices of the Ministry of Environment and Physical Planning. This legislation encompasses a range of bylaws that address various aspects, including the prohibition of GMO release

in specific areas and environments, the establishment of advisory bodies, intentional GMO release, and the restricted application of GMOs (Table 1).

North Macedonia's legislative framework for the authorization, import, and cultivation of GMOs is compatible with EU legislation. Furthermore, there is the the Law on Food Safety ("Official Gazette of RM No. 187/13", Article 55), with its amendments and revisions, including the prohibition of import, production, and placing on the market of genetically modified food "...until Macedonia becomes an EU member." This was seen as North Macedonia's establishment of a fundamental Food Law framework, aiming to create an integrated system where there should no longer be overlapping jurisdiction of institutions - the Food Directorate and the Veterinary Administration. North Macedonia currently lacks both a regulatory framework and a structured system for assessing the safety of GM foods. However, it does enforce mandatory and affirmative labeling regulations for GM food products, clearly indicating their GMO content (FAO, 2019).

Although North Macedonia banned the production and trade of GMO food in 2013, with the condition "...until it becomes an EU member", in reality, soybeans come from the Thessaloniki port, and traders buy cheap genetically modified soy, which is sold on the market without any control, as if it were GMO-free (Donev, 2019).

Two years after gaining independence from Serbia in 2008, **Montenegro** enacted the Law on GMOs ("Official Gazette of the Republic of Montenegro" no. 22/2008). This legislation established the regulatory framework for overseeing the controlled utilization, deliberate environmental release, and commercialization of GMOs and GMO-derived products. Furthermore, in line with the Law on Food Safety (Official Gazette of Montenegro no. 57/2015), the government introduced more comprehensive regulations concerning GM foods. These regulations are designed to ensure a high degree of human health protection and implement effective measures to preempt potential consequences linked to food or feed.

It's important to note that Montenegro has not conducted safety assessments of GM foods to date and does not anticipate conducting such assessments in the near future. Additionally, the country does not produce any GM food or feed but permits their importation, subject to authorization. Montenegro enforces mandatory labeling regulations for GM food products, explicitly indicating their GMO content (i.e., "It contains GMO") (FAO, 2022). Given that Montenegro relies on imports for approximately 90% of its food and livestock feed (Brankov&Matkovski, 2022), and due to the absence of GMO testing laboratories, it is plausible that GM foods may circulate in this market.

Serbia has been addressing GMO-related matters since 2001, with the adoption of the Law on GMOs, which established regulations for the controlled use, deliberate release into the environment, and marketing of GMOs and GMO products. Subsequently, on May 29, 2009, the National Assembly of the Republic of Serbia passed a new Law on GMOs (published in the 'Official Gazette RS,' No. 41/09). This law includes a comprehensive ban on the marketing of GMOs and GMO products, encompassing GM food and feed, as well as the commercial cultivation of GMOs. Serbia stands out among the previously mentioned countries due to the fact that 80% of its cities and municipalities (135 out of 169) have declared themselves GMO-free. A significant campaign, known as 'Serbia without GMO,' has been actively ongoing for several years (Brankov & Lovre, 2018). Since 2013 and the signing of the Danube Soya Declaration, Serbia has significantly increased soybean and soybean oil production, as well as exports. Serbia is the only self-

sufficient country in the Western Balkans in the production of soybeans and is the largest producer and exporter of unmodified soybeans in South East Europe (Agrofin, 2021).

However, it is worth noting that Serbia's border has been porous on multiple occasions, allowing GM seeds to enter the country. GM soy was discovered in certain years, such as in 2000 (5-7 hectares), 2005 (420 hectares), 2010 (200 hectares), and so on (Brankov, 2013).

Furthermore, there is currently no authorized system for certifying and labeling non-GMO local products in Serbia. This absence of a distinguishing label between locally produced non-GMO food items and imported products, particularly meat, milk, and other animal-based goods from GM-fed animals, poses a challenge. Additionally, there is no official framework to enhance the value of local production and set it apart from GM-produced imports. Consequently, local livestock farmers using non-GM feed face increased market competitiveness (Agroberichten Buitenland, 2020).

Kosovo* does not have specific national legislation concerning the regulation of GMOs. Since Kosovo's status is complex, it does not have a fully functioning government, and some of its regulatory matters are administered by the United Nations Mission in Kosovo (UNMIK). There is reasonable suspicion that unregistered GM soy enters Serbia through Kosovo (Sevarlic, 2019). It can be inferred that GMOs may be in circulation in the market in Kosovo, as this territory has been receiving food aid for decades, which may contain GMOs.

All the countries in the Western Balkans have ratified the Cartagena Protocol on Biosafety to the Convention on Biological Diversity. Albania did so in 2005, Bosnia and Herzegovina in 2009, North Macedonia in 2005, Montenegro in 2006, and Serbia in 2006. Furthermore, Albania has been a Party to the Nagoya-Kuala Lumpur Supplementary Protocol on Liability and Redress since 2018.

The regulation of new genome techniques, such as gene editing (e.g., CRISPR-Cas9), has not been developed in any Western Balkan country. Additionally, public discussions about them are not as widespread.

Table 1. GMO Regulatory Framework in the Western Balkans

Country	Legislation Specifically Addressing GMOs	Additional Legislation and Pertinent GMO Regulations
ALB	No	• Law on Food (No 9863/2008) • Law governing the production, processing, certification, and marketing of "bio products" (No 9199/2004) • Law on environmental protection (No. 8934/2002) • Law on protected areas (No. 81/2017) • Law on environmental impact assessment (No. 8990/2003).

BIH	Yes Law on GMOs ("Official Gazette of B&H" No. 23/09)	• Rulebook on the form and manner of keeping the unique register of genetically modified organisms ("The Official Gazette of B&H" No. 17/12). • Rulebook on establishing a system for the development and assignment of unique codes for genetically modified organisms ("The Official Gazette of B&H" No. 68/12). • Rulebook on the content of the notification and technical dossier for the placing on the market of genetically modified organisms or products containing and/or consisting of or deriving from genetically modified organisms and on the requirements for labeling and packaging of genetically modified organisms or products containing and/or consisting of or deriving from genetically modified organisms ("The Official Gazette of B&H" No. 78/12 and 62/15). • Rulebook on conditions and procedures for granting authorization for placing genetically modified food and feed for the first time on the market of Bosnia and Herzegovina and the requirements relating to their traceability and labeling ("The Official Gazette of B&H" No. 78/12). • Rulebook on the content and scope of risk assessment for placing on the market of genetically modified organisms and products consisting of, containing, or originating from genetically modified organisms and the methodologies for making risk assessments ("The Official Gazette of B&H" No. 79/12). • Rulebook on conditions of monitoring the environmental impact of genetically modified organisms or products containing and/or consisting of or originating from genetically modified organisms and their use ("Official Gazette of B&H," No. 64/14). • Rulebook on the procedure of evaluation and authorization of laboratories for testing, control, and monitoring of genetically modified organisms and products containing and/or consisting of or deriving from genetically modified organisms ("Official Gazette of B&H," No. 73/17). • Decision on the amount of the special fee for issuing a decision on the approval for placing on the market of genetically modified food and feed ("Official Gazette of BiH," No. 61/14).
MKD	Yes Law on GMOs (Official Gazette of RM No. 35/08)	• Annex to the Regulation on the determination of areas and surfaces where the release of genetically modified reproductive material into the environment is prohibited (Official Gazette of RM No. 113/09) • Regulation on the determination of areas and surfaces where the release of genetically modified reproductive material into the environment is prohibited (Official Gazette of RM No. 112/09) • Decision on the establishment of the National Water Council (Official Gazette of RM No. 149/09) • Regulation on the content of the emergency measures plan (Official Gazette of RM No. 163/09) • Regulation on the content of information for conducting risk assessment resulting from intentional release of GMOs (Official Gazette of RM No. 148/09) • Regulation on the limited use of genetically modified organisms*(Official Gazette of RM No. 08/11)

MNE	Yes Law on GMOs ("Official Gazette of the Republic of Montenegro" No. 22/2008).	• Law on Food Safety (Official Gazette of Montenegro no. 57/2015
SRB	Yes Law on GMOs ('Official Gazette RS,' No. 41/09)	• The Law on Food Safety (Official Gazette of RS, No. 41/09)
Kosovo*	No	• /

Source: FAO (2018-2023); GAIN (2015, 2022); European Commission (2022).

Disccusion

Since the dissolution of communist regimes in the 1990s, the Western Balkans have been undergoing multifaceted and intricate changes. These transformations are inherently complex, characterized by concurrent processes of democratization, transition, nation-building, state-building, and European integration (Jano, 2008). Accession talks are currently in progress with Montenegro and Serbia, while Bosnia and Herzegovina has been granted candidate country status. Accession negotiations with Albania and North Macedonia are ongoing, and Kosovo* is considered a potential candidate for EU membership. This transformative journey involves a range of structural and legislative reforms.

In the consolidation phase of the newly emerged Western Balkan states, the region experienced overall economic growth and increased agricultural productivity prior to the outbreak of the pandemic. However, this did not necessarily translate into greater competitiveness in relation to European export markets. Among the key weaknesses of the agricultural sectors in these countries are predominantly small-scale farms, a lack of market integration, and inadequately enforced production and food safety standards (Petrick, 2010).

The Western Balkan countries exhibit varying agricultural characteristics. All countries in the region, except Serbia, are net importers of agri-food products, with a growing trade deficit (Table 2). Serbia is the only country with an overall self-sufficiency level above 100% and so far successfully plays the role of the region's key supplier (Brankov et al., 2022). Farm sizes range from the smallest in Albania, averaging just 1.2 hectares, to the largest in Montenegro, with an average size of 4.5 hectares. Rural areas are inhabited by nearly half of the region's population, with the percentage being the highest in Bosnia and Herzegovina at 51% and the lowest in Montenegro at 32%. When it comes to employment, agriculture makes up a significant share, constituting 36.4% of total employment in Albania but only 7.1% in Montenegro. In terms of its contribution to the overall economy, agriculture played a substantial role in 2019, accounting for approximately 21% of Albania's GDP, 15% of Kosovo's GDP, 9.3% of

North Macedonia's GDP, 7.4% of Serbia's GDP, and the smallest proportion, 6.4%, of Montenegro's GDP.

Table 2. Key Agricultural Statistics for Western Balkan Countries/Territories (2019)

	GVA Share (All Sectors)	Rural population (%)	Agri. Sector Share in Total Emp (%)	Trade Bal. Agri-Food. (mill. EUR)	Agri. Total Land. (000 ha)	Agri. Total Land. (ha/pc)	No. of Agri. Holdings (000)	The average farm size (ha)
ALB	21.3	39	36.4	-609.6	1,201	0.42	352.1	1.2
BIH	6.6	51	9.4	-1270	2,217	0.64	363.4 (2013)	2.0
MKD	9.3	42	13.9	-210.8	1,265	0.6	178.1 (2016)	2.5
MNE	6.4	33	7.1	-529.6	257.5	0.41	43.8	4.5
SRB	7.4	44	15.6	1,311	3,482	0.5	564 (2018)	3.7
Kosovo*	15.3	/	/	-694.4	416	0.23	130.7 (2014)	3.2

Note: GVA (Gross value added of the agriculture, forestry, hunting and fishery sector at current prices); UAA (Utilised agricultural area).

Source: Agricultural Policy Plus (2023); data for the average farm size was used from Lovre (2016); data for rural population from World Bank (2023)

Following the 2008 crisis, which interrupted the EU's enlargement policy for the Western Balkans, the region has witnessed increased engagement from non-EU countries, including China, Russia, Turkey, and the United Arab Emirates. This engagement primarily encompasses direct investments, trade, and energy security initiatives (Vulovic, 2023). Trade integration between the Western Balkan countries and the EU has not yielded sufficient benefits, with all countries, except for North Macedonia, clearly experiencing trade deficits with the EU. The current trade integration model with the EU does not enhance the competitiveness of the Western Balkan nations. Improved trade integration could be achieved through the reduction of non-tariff barriers, such as the removal of specific import quotas, and by promoting competitiveness through institutional modernization and infrastructure development. Additionally, investments in green and digital transitions could enable the Western Balkan countries to establish themselves as more resilient economic hubs (WIIW, 2023). The EU's inability to implement a geoeconomic strategy in its neighboring regions is evident through the following observations: China's influence as a trading partner in the EU's neighboring countries is rapidly expanding. China is increasingly offering debt financing for investment projects as part of its Belt and Road Initiative. Furthermore, China's share of ICT imports is on the rise across the neighboring regions, whereas the EU's share is in decline. This trend is particularly evident in the area of infrastructure, where China poses a significant challenge to the EU.

Furthermore, a noteworthy 85% of the populace in Serbia, the region's primary supplier country, demonstrates significant support for Russia, as reported by Euroaktiv in 2023. Additionally, 40% of respondents, according to Carnegie Europe's 2023 study,

express a preference for discontinuing membership negotiations with the European Union. Serbia holds a prominent position as the largest agricultural market in the Western Balkans, distinguished by a rich heritage in agricultural production and food processing. Notable among Serbia's products with substantial production and export potential are grains, oilseeds, sugar, fruits, vegetables, non-alcoholic beverages, water, and confectionery items. The food processing sector contributes to approximately one-third of Serbia's overall processing industry (ITA, 2023). Serbia also holds a global leadership position in the production of non-GMO corn and raspberries, establishing a niche market for these products, with customers guaranteed GMO-free corn (Reuters, 2016).

The suspension of the EU integration process with the Western Balkans, coupled with the overall outlook of gradual progress, has left political leaders and the public in the region disheartened and disillusioned with the EU. As a response to these challenges, an initiative known as 'Open Balkan' has emerged among Western Balkan nations. This regional cooperation initiative aims to establish a unified market akin to the European Union, enabling the free movement of citizens, goods, capital, and services among its member states. Launched in 2019, this initiative has garnered the support of Serbia, Albania, and North Macedonia, with further signatories anticipated (Tota &Culaj, 2023).

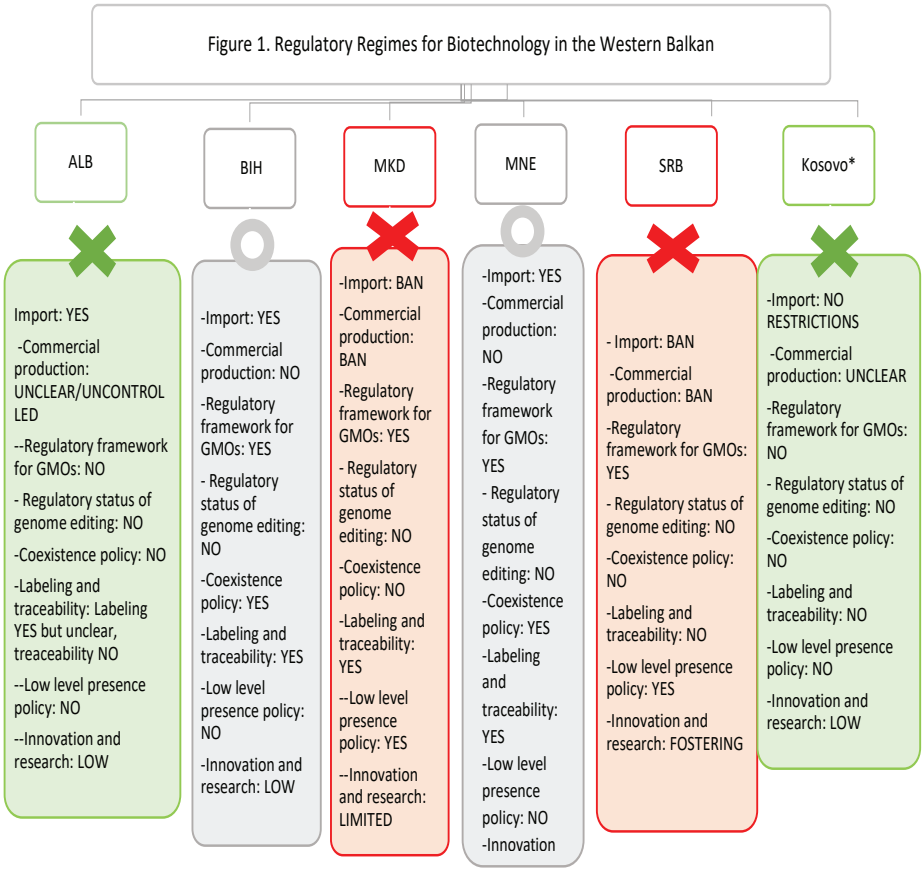
Variations in GM policies across various Western Balkan countries (Figure 1) are influenced by a range of factors, with significant public resistance being a prominent contributor.It can be most easily explained through the example of Serbia. So far, well organized anti-GMO social movements have blocked Serbia's accession to WTO, and brought the political elite into a very difficult situation. Under the influence of the EU, the US, WTO, and Serbian import interest groups, government officials occasionally hint at the possibility of amending the stringent laws. However, such decisions are consistently postponed until the next election cycle, which occurs very frequently in Serbia. On the surface, it may appear that the political leadership acknowledges the unfavorable public sentiment and the country's comparative advantages in producing non-GM foods and feeds within the agriculture sector. Nevertheless, they do not sufficiently safeguard Serbia's agricultural potential and seed breeding endeavors. Furthermore, the government tend to favor foreign seed providers while impeding domestic production. From this perspective, Serbia has become an attractive destination for corporate interests.

On one hand, in 2022, a landmark Agreement was signed at the World Economic Forum (WEF) headquarters in Geneva, paving the way for the establishment of the WEF Center for the Fourth Industrial Revolution in Serbia. This marks a pioneering initiative within the Western Balkans region. The ecosystem that will take shape around this Center is poised to harness the existing infrastructure, including the National Artificial Intelligence Development Platform, the Genome Sequencing Center, and the forthcoming Bioeconomic Center - BIO4 campus (RTV, 2022). On the other hand, Serbia presently allocates a relatively modest budget to support scientific endeavors, with the total national investment in research amounting to only 0.89% of GDP in 2016. A significant portion of this budget is channeled toward education rather than research. Insufficient funding is directed toward critical investments in research infrastructure, and access to equipment and facilities owned by other institutions such as universities and research institutes remains limited. High-impact projects like the BioSense/ANTARES undertaking in Novi Sad primarily benefit a select group of researchers in proximity,

rather than the broader research community (SPHERE, 2017). Consequently, the long-standing phenomenon of brain drain poses considerable challenges to the realization of the goals associated with the Fourth Industrial Revolution.

However, the outcome of the state's somewhat ambiguous policy stance will be contingent upon the realization of broader political objectives. Should Serbia successfully meet all the requirements for EU accession, the stringent laws may be revised. Conversely, if the government abandons the pursuit of EU membership, and if the movement maintains its current momentum, it is unlikely that the laws will be altered. The same can be applied to gene editing regulations.

If Serbia retains its current restrictive laws, while, for instance, Albania allows the free and full importation of GMOs or enforces the gene editing regulations proposed by the European Commission, the existence of an Open Balkan initiative would lose its purpose. Since the Open Balkan initiative implies the free movement of goods, it also implies the free movement of GMOs and NGTs. In this scenario, the Serbian law would become irrelevant. In other words, for the Western Balkans to maintain the Open Balkan initiative, all member countries must establish uniform laws concerning GMOs and NGTs.



Source. The authors' composition

Conclusion

This analysis delves into the current regulatory landscape for GM products and crops within Albania, Bosnia and Herzegovina, North Macedonia, Montenegro, Serbia, and Kosovo*. Despite these nations hailing from the Western Balkans region, their stances on GMOs vary significantly (as illustrated in Figure 1). Notably, Albania and Kosovo* exhibit support for GMOs, while Bosnia and Herzegovina and Montenegro align with EU regulations. Meanwhile, Macedonia and, to a greater extent, Serbia, ostensibly strive to maintain a GMO-free status. None of the countries examined have established rules pertaining to NGTs. The diverse stances of Western Balkan countries on GMOs and NGTs highlight the complexity of this issue within the region.

In summary, it is imperative for countries within the same region to adopt a uniform regulatory framework on NGTs issue. Failure to do so could render the Open Balkan initiative untenable. The trajectory of GMOs and NGTs will be influenced by ongoing geopolitical developments. Regardless of the eventual outcome, it remains crucial to concentrate efforts on disseminating precise and transparent information to the public. Divergent perspectives underscore the need for deliberate reflection and constructive discourse among policymakers. Irrespective of the outcomes, it remains essential for these countries to uphold open lines of communication, exchange precise information, and participate in collaborative initiatives aimed at aligning regulatory frameworks with the unique requirements and ambitions of the region.

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AUTOMOTIVE SUPPLY CHAIN DISRUPTIONS CAUSED BY CRISIS IN UKRAINE

Abstract

The aim of the work is to analyze the functioning of supply chains in the automotive industry in the conditions of the crisis caused by the war in Ukraine.

First of all, the theoretical foundations are set, through defining the concept and importance of supply chains, determining the goals of chain management and the difference between traditional and modern supply chains. Then, the economic impact of the crisis in Ukraine on the entire world economy is observed, by analyzing macroeconomic indicators, global consequences, but also the impact on the two main parties in the conflict - the Russian Federation and Ukraine. Finally, the analysis of supply chains in the automotive industry in the period of crisis is approached, through presenting the current situation, defining risks and predicting the future of supply chains in this industry.

***Key words**: supply chains, crisis in Ukraine, automotive industry, global crisis, economy*

***JEL classification:** H56, L62, R41*

ПРЕКИДИ ЛАНАЦА СНАБДЕВАЊА У АУТОМОБИЛСКОЈ ИНДУСТРИЈИ ИЗАЗВАНИ КРИЗОМ У УКРАЈИНИ

Апстракт

Циљ рада је да се анализира функционисање ланаца снабдевања у аутомобилској индустији у условима кризе изазване ратом у Украјини.

Најпре се постављају теоријске основе, кроз дефитинисање појма и значаја ланаца снабдевања, одређивање циљева начина управљања ланцима и разлици између традиционалних и савремених ланаца снабдевања. Затим се посматра економски утицај кризе у Украјини на целокупну светску економију, анализом макроекономских показатеља, глобалних последица али и утицаја на две главне стране у сукобу - Руску Федерацију и Украјину. Коначно, приступа се анализи ланаца снабдевања у аутомобилској индустрији у

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периоду кризе, кроз презентовање тренутне ситуације, дефинисање ризука и предвиђање будућност ланаца снабдевања у овој индустрији.

Кључне речи: ланци снабдевања, *криза у Украјини*, *аутомобилска индустрија*, *глобална криза*, *економија*

Introduction

Supply chains attract the attention of a large number of theorists and practitioners in the field of economics. There are different definitions of this term. Among all of them, they have certain common characteristics that are just formulated in a different way.

Technological developments have enabled national and global supply chains to contribute to economic development, job creation, poverty reduction, and increased cooperation and interdependence. Supply chains play a key role in delivering raw materials or materials to end consumers. (Retrieved December 12, 2022 from https://vvv.ilo.org/global/topics/suppli-chains-previev/lang--en/indek.htm). The escalation of the crisis in Ukraine, which started back in 2013, caused disruptions and interruptions in supply chains in all sectors of the economy. The Russian Federation and Ukraine are large producers of food, but also suppliers of energy, as well as certain raw materials such as palladium, aluminum, argon, neon and many others. The introduction of sanctions against the Russian Federation, the suspension of imports and exports, the closure of many ports and the restriction of air traffic, led to a shortage of the above-mentioned components and an increase in their prices, especially in Europe. This was followed by a double-digit increase in inflation, with a tendency for it to increase. (Retrieved December 19, 2022, from https://www.economicsobservatory.com/what-would-be-the-economic-consequences-of-a-military-stalemate-in-ukraine).

The crisis in Ukraine also affected the European automobile industry, which produces more than one fifth of the total cars produced in the world. As the Russian Federation and Ukraine are large and significant suppliers of auto parts, supply chain disruptions have slowed down or completely stopped their supply, making it difficult to manufacture cars in European countries. Also, sooner or later, all European car companies withdrew from the Russian market, as a sign of protest, and as a result suffered great losses. This made it easier for Chinese car manufacturers to enter the market of the Russian Federation. (Retrieved December 12, 2022, from https://www.businesswire.com/news/home/20221202005447/en/Russo-Ukrainian-War-and-its-Effects-on-the-Global-Automotive-Industry-Worsening-Supply-of-Raw-Materials -Semiconductor-Chips-EV-Batteries-would-Lead-to-1-Million-Fewer-Vehicles-Produced-Worldwide---ResearchAndMarkets.com).

After the introductory considerations, in the first part of the paper, entitled *Concept of Supply Chains*, terms related to supply chains are identified and the goals and methods of supply chain management are defined.

In the second part of the paper, entitled *Economic impact of the crisis in Ukraine on global business*, the impact of the crisis on macroeconomic indicators of countries is analyzed. Then the effects of the crisis on the warring parties and its global consequences are elaborated.

In the third part of the paper, entitled *Supply chains in the automotive industry during the crisis period in Ukraine*, the subject of analysis is the companies that left the market of the Russian Federation as well as the Chinese companies that took their place.

European companies from the field of the automotive industry suffered the most damage, due to the withdrawal from the market of the Russian Federation, which was taken advantage of primarily by Chinese companies. Finally, supply chain risks and perspectives are discussed.

The concept of supply chains

If viewed from a historical perspective, the term "logistics" comes from the Greek word "logistikos", which means "art of calculation". Over time, the term began to be associated with the military activities of supplying troops located at the front with ammunition and all means. In the 1960s, logistics became a quantitative science to which an engineering perspective was added. From the 1970s to the 1990s, efforts were made to shorten transit times in order to reduce overall costs. Since the 1990s, the focus has been on improving quality as a means of differentiating the offer. Also, in addition to the application of information technologies, we strive to establish good relations with suppliers and end consumers. At that time, there is a merger of organizations, in order to increase market share and achieve higher sales. Then the supply chain comes into play. (Milovanović, Barac & Anđelković, 2011).

Supply chains attract the attention of a large number of authors, which contributes to the creation of a large number of works on the same topic. There are different definitions and determinations of supply chains, where each of the authors, based on the most important characteristics, defines the term. Regardless of the differences, we can say that the supply chain is a network of organizations that performs the activities assigned to it in order to create value for the end consumer. (Mitrović & Mitrović, 2019).

In modern business, supply chains face numerous challenges. First, a potential lack of transparency can jeopardize the business of a party that does not have enough information that is being withheld from it. Second, an inadequately optimized production process increases the total amount of waste on a global level, as well as inventory. Third, the disappearance of goods causes consumer dissatisfaction. Fourth, the increase in customer demands increases the chances that the supply chain will not be able to keep up with all the demands and novelties that exist from day to day. Due to all the challenges, it is suggested that the supply chain strives to increase flexibility and minimize inventory losses, to devote its time to improving relations with customers and suppliers, to shorten the cycle from procurement to final delivery and to be familiar with the latest technology in order to be able to apply it. (Retrieved December 22, 2022, from https://www.techtarget.com/whatis/definition/supply-chain). Modern supply chains are also subject to an increasing degree of risk. Such vulnerability makes it difficult to manage and is a challenge for companies that should create awareness about this problem, to identify the source of risk as well as strategies to reduce it. (Barac, Milovanović & Anđelković, 2011). In order to improve business performance, it is necessary to effectively manage supply chain risk. (Milovanović, Milovanović & Popović, 2018).

Supply chains involve a large number of participants, usually three or more. Manufacturers, suppliers, wholesalers, retailers, buyers are just some of the participants in supply chains. When buying any product, the customer usually does not buy directly from its manufacturer, but through an intermediary. (Felea1 & Albăstroiu, 2013). The mentioned entities join together, because it provides a large number of advantages for each of them individually. The association of subjects in supply chains enables reduction of total costs and increase of: efficiency, exchange of knowledge, rate of innovation and performance. (Arora & Brintrup, 2021).

By introducing the conveyor belt, Henry Ford aimed to produce as many products as possible and to reduce costs per unit of product. The purpose of the conveyor belt is to perform all activities on it, thus eliminating the need to provide a separate machine for each activity. This logic can also be applied to the supply chain. The main goal of the supply chain is the creation of greater value through mutual cooperation compared to the one that would be obtained if all entities functioned independently. The total value of the supply chain, which will be created, depends on all the individual values realized by each of its members. The greater the degree of integration between the members, the greater the value will be realized. (Aćimović, 2018).

In order to improve the efficiency of supply chain management, vertical integration can be used to reduce costs, increase business efficiency and improve competitive activity through cooperation and efficiency. Each member of the supply chain has the freedom to define its own supply system, except in cases where there is a clear intention to restrict other members or through a conscious enhancement of its own domestic product. (Končar, Marić & Vukmirović, 2018).

When managing the supply chain, the main focus is on the satisfaction of the end consumers, which means that the supply chain should be managed in such a way as to achieve consumer satisfaction. In order to create an insight into the fulfillment of the main objective of supply chain management, success measurement is carried out, which aims to show the level of success and, if necessary, to enable the performance of corrective actions if there are deviations. (Putri, Huda, Sinulingga, 2019). Good supply chain management is imperative today. Consumer demands are increasing and any, even minimal delays in product delivery can cost the entire supply chain dearly. It is necessary that all activities are coordinated, that there is good communication and coordination between members, so that unforeseen situations do not occur and that consumers are satisfied with the offered products or services. (Kleab, 2017).

Today, the Internet is used more and more for communication and business. Due to this fact, the need to protect supply chains from cyber attacks and hacking is growing. (Retrieved December 23, 2022, from https://www.ibm.com/topics/supply-chain-management).

The economic impact of the crisis in Ukraine on global business

The beginning of the crisis in Ukraine is not related to 2014 or 2022. This crisis officially manifested itself for the first time in 2014, but it was preceded by several years of tensions. First, in 1991, a new nation state was created. Second, over time, Ukraine has isolated itself from economic blocs and collective security organizations. Third, the

rivalry between Russian and European imperialism followed. Fourth, the strengthening of Russian influence was manifested while the weakening of European influence. The property of Ukraine was gradually transferred into the hands of a few people, who began to manage it for private and personal benefit. (Retrieved December 23, 2022, from https://commons.com.ua/ru/prichini-ukrayinskoyi-krizi/).

In November 2013, the President of Ukraine Viktor Yanukovych (Viktor Yanukovych) abruptly stopped the preparations to start the process of joining Ukraine to the European union. In December 2013, large protests broke out in Ukraine, during which, as well as in those in the first quarter of 2014, there were deaths. Pressure from Europe led to the overthrow of the president of Ukraine and his departure to the Russian Federation. After sending troops from the Russian Federation to Crimea, a referendum was held in Ukraine, in which it was voted that Crimea should join the Russian Federation. The holding of elections and the appointment of Vladimir Zelensky (Vladimir Zelenskij) as the head of state by Europe, the approach of NATO troops to the Russian Federation and the improvement of its security, as well as the poor life of people in Ukraine, led to the crisis we are witnessing today. (Retrieved December 23, 2022, from https://roem.ru/03-03-2022/287520/mirshmaier-ukraine/).

The crisis in Ukraine has affected not only the parties in conflict, the Russian Federation and Ukraine, but also the whole world. In the countries of Europe (primarily in the countries of the European union), there was a decrease in GDP and an increase in inflation above all planned limits. Unlike Europe, some Asian countries are experiencing high growth (they are expected to achieve almost three quarters of global GDP growth). Saudi Arabia recorded the most significant growth in Asia. For 2022, GDP growth of 9.8% compared to 2021 (base year) was predicted. In 2023, GDP growth of 5% and 3.5% in 2024 is expected. The expected growth in India is 5.7% in 2023 and 6.9% in 2024. Japan is projected to achieve positive growth rates in 2023 and 2024. In 2022, China achieved GDP growth of 3.3% compared to the previous year. For 2023, a growth of 4.6% compared to 2022 is predicted, as well as a growth of 4.1% in 2024 compared to the previous year. High growth rates were also predicted for Indonesia in 2022. growth of 5.3%, while for 2023. predicts growth of 4.7% and in 2024. growth of 5.1%. Unlike Asian countries, the situation in Europe is completely different. It was also predicted that in 2022 FR Germany would achieve growth of only 1.8%, while for 2023. predicts that GDP will fall by 0.3%. A slight recovery or continuation of bad results is also predicted for 2024, where growth of only 1.5% is predicted. Although the public is talking about the profiteering of the United States of America, the data show, at least those related to GDP, that in 2022. The United States of America will achieve a growth of only 1.8% of GDP, in 2023 a growth of 0.5% and in 2024 a growth of 1%. For the Russian Federation, it was predicted that in 2022. achieve a drop of 3.9%, while a drop of as much as 5.6% is expected in 2023 and a slight drop of 0.2% in 2024. When it comes to inflation, the inflation rate is high all over the world. It was also predicted that the highest values will be recorded in 2022, while over the next two years, the situation will gradually stabilize, which should lead to a drop in inflation. In FR Germany, the predicted inflation for 2022 was 8.48%, while forecasts for 2023 indicate that it will amount to 8% and in 2024 to 3.34%. The situation is similar in other European union countries. In the United States, inflation is at a lower level than in Europe. It is predicted that it will amount to 3.52% in 2023 and 2.57% in 2024. Again, as when talking about GDP, Asian countries record low

inflation rates. In Saudi Arabia, inflation of only 2.6% was predicted in 2022, 3.2% is the forecast inflation level for 2023 and 2.3% for 2024. The situation is the same with Japan: 2.3% in 2022, 1.97% in 2023 and 1.67% in 2024. (Retrieved December 24, 2023, from https://www.oecd.org/economic-outlook/november-2022/).

The great energy dependence of the European union on gas from the Russian Federation can be confirmed by the fact that in 2019 the import of oil and gas amounted to 200 billion euros. Due to the introduction of sanctions by the European union, it will have to increase imports from alternative suppliers by as much as 70%, which is a very expensive option in the short term. Before finding substitutes, they need to be at an acceptable price, which is not often the case in times of crisis. Before the crisis in Ukraine, the European union was affected by the consequences of the Covid-19 virus pandemic, as shown by the reports of the European Central Bank. The Russian Federation is also feeling the effects. Companies from this country have a lower value on the stock market, the value of the ruble has fallen, inflation has increased, the funds of Russian banks have been frozen and imports are limited. However, this segment, which refers to imports, was compensated by the support of Asian countries. (Khudaykulov & Obrenović, 2022).

The pandemic caused by the Covid-19 virus has led to the disruption of global economies and the instability of the global market. The pandemic has not yet ended, when a new crisis is emerging caused by the war in Ukraine. This pushed the unrecovered economies into a new crisis, where the consequences of the previous one were still present. Although the pandemic did not end with the start of the war, it gave the impression that it did. The war became the center of interest all over the world. Although the war concerns two countries - the Russian Federation and Ukraine, as two Orthodox countries, countries around the world got involved in the war and chose sides in the war, who to help and who to harm and stop the action. According to estimates by the International Monetary Fund (IMF), global growth is predicted for 2022. from 4.4% to 4.9% compared to 2021. However, the optimistic predictions that existed were erased by the crisis. If we look at Ukraine, since the period of more intense crisis in 2013. until 2017. there is a drop in GDP by as much as 15.1%. After the start of the war, many European countries imposed sanctions on the Russian Federation, which included blocking Russian banks from using the "SWIFT" system, suspending the certification of the Nord Stream 2 gas pipeline by Germany, New Zealand banning the source of goods to the Russian military, The United States of America banned the export of military technology, the European union introduced financial sanctions, the export of aircraft and equipment, then made it more difficult for banks to operate, canceled the visas of well-known Russian citizens, who are most often referred to as dyolomates, who will not be able to travel to European countries under preferential conditions Union, Canada revoked export permits, Switzerland and Japan freeze Russian assets held in their banks, Australia imposed a travel ban. Finland, Belgium, Latvia, Ireland, Estonia, Lithuania, Poland, Bulgaria, Moldova, Romania, Slovenia and the Czech Republic have banned Russian planes from flying through their airspace, while Great Britain also introduced financial and other sanctions. On the one hand, there are sanctions aimed at the Russian Federation, while on the other hand there is aid directed to Ukraine - from humanitarian aid in the form of food, to the most modern combat equipment. The Russian Federation responded to the sanctions by: banning the export of over 200 products until the end of 2022, increasing interest rates to stop the fall of the Russian ruble, banning interest payments to foreign investors who own Russian

government bonds, and many others. This can harm the Russian Federation itself, which has warned of the possibility of introducing countersanctions if the situation does not change in favor of the Russian Federation regarding the sanctions introduced against it. From the beginning of the crisis until today, there has been no change, nor the end of the war. Long-term consequences for both countries and the whole world are predicted. (Ozili, 2022).

It is expected that the costs of sanctions against the Russian Federation will be compensated through higher energy prices, however inflation forecasts for 2022. they say that it is estimated at more than 20%. Also, there are negative predictions related to the movement of GDP and other macroeconomic indicators. (Retrieved December 25, 2022, from https://www.niesr.ac.uk/publications/economic-costs-russia-ukraine-conflict?type=policy-papers).

Although the share of the Russian Federation and Ukraine in the total global production and trade is relatively small, they are significant suppliers of basic foodstuffs and energy. In 2019, if we look at aggregate exports, they recorded 25% of wheat exports, 15% of barley exports and 45% of sunflower exports from the total exports of the aforementioned foods to the world. When it comes to energy sources, the Russian Federation meets 1/5 of the world's total demand for natural gas. The Russian Federation, in addition to supplying the aforementioned raw materials and energy, is a large and significant supplier of palladium and rhodium, which are key to automobile production. (- Retrieved December 26, 2022, from https://www.wto.org/english/news_e/news22_e/devel_08apr22_e.htm).

The Russian Federation and Ukraine are also major suppliers of internal gases, such as argon and neon, which are key to semiconductor production. Titanium sponge, which is produced in these two countries, is crucial for the production of airplanes. Uranium, in addition to those mentioned above, is important for world production, and the largest source is found in the two warring parties. With the beginning of the conflict, the price of all these cheeses rose significantly, which consequently led to an increase in the prices of the products in which they are found, along with their difficult procurement. Monetary policies around the world raise interest rates by slightly more than 1 percentage point in developed countries, while in developing countries the increase goes up to 1 and ½ percentage points, with constant control and application of timely measures. (Retrieved December 27, 2022, from https://www.oecd-ilibrary.org/sites/4181d61b-en/index.html?itemId=/content/publication/4181d61b-en).

The crisis in Ukraine has affected different parts of the world in different ways. By far the biggest negative effect is recorded in Europe, especially in the European union. According to forecasts of the European Commission (EC), the impact of Covid-19, the slowdown of supply chains and the rise in energy prices could have the effect of flattening the economic growth curve for all countries of the European union that use the euro as their currency to 4%. (Endam Mbah & Wasum, 2022).

If we look at Africa, Egypt is highly dependent on the import of wheat from the Russian Federation and Ukraine, because it imports 80% of wheat from the mentioned countries to meet its own needs. Also, the negative effects will be reflected in tourism. In Latin America, inflation above 8% is recorded, and the highest in: Brazil, Mexico, Chile, Costa Rica and Peru. Higher oil prices hurt importers from Central America and the Caribbean, while exporters of oil, copper, iron ore, corn, wheat and metals can

charge more for their products and thus cushion the impact on growth. However, unlike all the other parts of the world, where the crisis spread, the least damage is related to the countries of Asia, precisely because of the small trade cooperation between the countries in conflict and Asian countries. Possible pressures on food prices are mitigated by encouraging domestic production and greater reliance on rice compared to wheat. (Retrieved December 28, 2022, from https://www.imf.org/en/Blogs/Articles/2022/03/15/blog-how-war-in-ukraine-is-reverberating-across-worlds-regions-031522).

Supply chains in the automotive industry during the crisis period in Ukraine

The Covid-19 pandemic has disrupted supply chains in the automotive industry. A shortage of semiconductors and parts during that period was a reality facing the automotive industry. However, it was expected that this situation would be resolved with the end of the pandemic. However, hardly anyone could have guessed that the recovery of supply chains in this industry would be more difficult compared to the forecasts at the time. Ukraine is among the world's largest suppliers of cables used in the production of automobiles. With the emergence of the crisis in Ukraine, supplies from Ukraine to other parts of Europe became much more difficult. The German automobile industry was particularly affected, where before the crises the supply was relatively simple, especially from Western Ukraine. Today, the supply is difficult, which has a negative effect on the car product. In addition to cables, Ukraine and the Russian Federation are large sources of other rare elements such as neon and palladium. Neon gas is used to manufacture microchips. Palladium is used as a catalytic element for the production of microchips. Also, nickel and cobalt, as the two main raw materials used for the production of car batteries, will be in smaller quantities in other European countries. Due to the imposed sanctions on the Russian Federation, the price of these elements will inevitably increase. According to some estimates, that increase will be at least 20%, which will significantly increase the price of electric cars. With the introduction of sanctions against the Russian Federation and the departure of companies from this country, there was a decrease in income. Its market is the world's largest car market. Annual sales for years past exceeded 1.5 million sales. A large number of companies left this country (Volkswagen, Ford, Toyota, General Motors, Honda, Bentley, Nissan, Porsche, Jaguar, Ferrari), as well as a large number of component manufacturers (Continental, Magna, Aptiv, Leoni). However, Renault (Renault Group), as the largest car seller in this country, did not withdraw its production. Škoda joins the list of companies from Europe that have kept their production, with its two factories. The departure of most European companies, on the other hand, opened the market for the entry of Chinese original equipment manufacturers. In this way, China has seen its opportunities that it wants to use, which will achieve a large participation in a large market. Observed according to car brands, in 2021, as stated above, Renault had the largest share in the Russian Federation (32.1% share in total sales), followed by Hyundai with a share of 22.7%, Volkswagen (Volkswagen), 12.3%, Toyota (Toyota), 7%, Gaz (Gaz), 3.4%, BMW (BMW), 3% and others with a share of 19.6%. The situation changed dramatically with the exit of the aforementioned companies, except for Renault, and the entry of Chinese automobile companies. (Retrieved January 3, 2023, from https://www.counterpointresearch.com/ukraine-crisis-reco-automotive-recovery).

With the emergence of the crisis in Ukraine, due to the introduction of sanctions and the increased risk for doing business in the war-torn territory, some car companies either temporarily or completely and permanently stopped the production process in the Russian Federation and withdrew from the market. Toyota has closed its factory in St. Petersburg. The American giant Ford has stopped and suspended its "joint venture" with the Russian automobile company "Sollers OJSC". Hyundai has also halted production at its plant in the Russian Federation. However, they were among those who hope that the closure will last as short as possible and that they will be able to resume business soon. Analyzes show that, according to current information, the damage to the entire sector of the automotive industry at the global level could be reduced sales by about 1.5 million cars annually. Toyota also shut down its production due to the inability to obtain parts. (Retrieved January 6, 2023, from file:///C:/Users/korisnik/Downloads/Ukraine%20War%20Plunges%20Auto%20Makers%20Into%20New%20Supply-Chain%20Crisis%20-%20WSJ.pdf).

When it comes to Renault, it is the biggest European giant in the market of the Russian Federation. According to the volume of sales, the Russian Federation is the second most important market after the native France, with more than 482,000 vehicles sold in 2021. Also, it owns a large number of subsidiaries in this country where over 200,000 people are employed. Renault is also the largest shareholder in Avtovaz (Avtovaz), with a 67% stake in the share capital, the main producer of Lada vehicles in the Russian Federation. Avtovaza's production facilities are dependent on imported parts from Western Europe, which undoubtedly affects the slowdown in production and sales. The automotive group, which includes 14 brands, the largest of which are Peugeot (Peugeot), Citroen (Citroen) and Fiat (Fiat), has ended the import and export of vehicles from the Russian Federation, but with the retention of production in Kaluga (Kaluga) north of Moscow. Production has continued in this city and is intended only for the market of the Russian Federation. At the end of 2022 and this brand is leaving the Russian market. (Retrieved January 6, 2023, from https://www.sneci.com/blog/situation-in-ukraine-consequences-for-the-automotive-industry/).

Unlike most companies from Europe, on the other hand, there is an increase in the sales of Chinese companies, which currently make up 1/3 of the car sales market in the Russian Federation. Sales of the three main Chinese brands (Haval, Chery and Geely) increased by almost double to 16,138 units in November 2022, in contrast to January and the pre-crisis period when it amounted to 8,235 units sold. The market share also increased to 31.3% from 9.6% according to the analyzes of the Russian analytical agency Autostat (Autostat). The market share of Chinese automobile companies in 2022, observed by month. by month, it moved as follows: January (9.6%), February (9.4%), March (9.6%), April (12.6%), May (16.9%), June (21%), July (24.3%), August (25.9%), September (27%), October (29.5%), November (31.3%). For the first 10 months analyzed, the Russian Federation was China's 6th export market when it comes to the automotive industry. (Retrieved January 7, 2023, from https://www.reuters.com/business/autos-transportation/chinese-grab-russian-car-market-share-after-western-rivals-depart-2022-12-08/).

The number of Chinese car showrooms in 2022. increased by almost 300 new stores, so their total number is 936. Only in the period July-November 2022. as many as 185 new salons were opened (leading among them with 48 stores opened is the Exeed

brand). Among the brands that did not enter the top ten, we should mention Voyah, Skywell and GAC, which opened a single-digit number of salons, but their potential for growth and expansion is noticeable. (Retrieved January 7, 2023, from https://www.russia-briefing.com/news/chinese-auto-dealers-take-over-eu-exited-russian-market.html/).

Statistically speaking, in 2021. for the first time, Chinese car exports exceeded 2 million units, accounting for 7.7% of total Chinese car sales according to the China Association of Automotive Manufacturers (CAAM). Of that number, sales in the Russian Federation amounted to 117,700 units, which is twice as much compared to 2020. The situation in 2022 was favorable for Chinese companies, as shown above, which had an even greater impact on increasing sales and gaining an ever-increasing market share. (Retrieved January 9, 2023, from https://carnewschina.com /2022/03/04/russo-ukrainian-wars-impact-on-chinese-car-companies/).

Of over 60 automotive brands that operated in the Russian Federation, due to sanctions and difficulties in obtaining raw materials, in 2022. there are only 14 brands left, 3 domestic and 11 Chinese. Three smokers (Lada, GAZ and UAZ) and Chinese brands (Chery, Geely, Haval, Jac, Faw, Dongfeng, Changan, Exeed, Gac, Foton, Omoda). (- Retrieved January 10, 2023, from https://intellinews.com/only-11-foreign-car-brands-left-in-russia-out-of-60-before-the-war-265282/).

Great Wall Motor's subsidiary, Haval (Haval), is unique in that it is the first Chinese car manufacturer to sign a special agreement with the Russian Ministry of Industry and Trade. According to him, it is predicted that the investment will amount to 42.4 billion Russian rubles ($650 million), which is intended for the expansion of the car factory that was opened in Uzlovaya. (https://www.automotivemanufacturingsolutions.com/assembly/chinese-carmaker-haval-signs-a-major-investment-contract-in-russia/41210.article - Retrieved 11/01/2023). Its plan is to localize more than 80% of Russian car production in the next 6 years. Until August 2022. 2000 jobs were created. The plan is to open another 4,000 in the future. The production capacity of the factory in the first phase is 80,000 cars per year, while the planned production capacity for the future is 150,000 cars per year. (Retrieved January 12, 2023, from https://interfax.com/newsroom/top-stories/82405/).

As for production in the Russian Federation by German car companies, in 2021. 170,000 were produced for the Russian market. (https://www.reuters.com/business/autos-transportation/german-carmakers-warn-fallout-ukraine-invasion-production-get-worse-2022-03-02/ - Retrieved 15/01/2023) . Immediately after the beginning of the crisis, it hit the factories of Volkswagen (Volkswagen) both in Germany and in Eastern Europe. He stopped his production facilities in the city of Zwickau (Zwickau) in eastern Germany where electric cars are produced primarily for the market of the United States of America. Also in the city of Wolfsburg (Wolfsburg) there are difficulties and interruptions in production. Furthermore, Porsche, which is owned by the Volkswagen company, stopped its production in Leipzig, where the famous Panamera and Macan models are produced. (Panamera and Macan). In this way, the delivery of the same to fans of these models around the world is slowed down. (Retrieved January 18, 2023, from file:///C:/Users/korisnik/Downloads/Ukraine%20War%20Plunges%20Auto%20Makers%20Into%20New%20Supply-Chain%20Crisis%20-%20WSJ.pdf).

This company locates an increasing number of production plants in the United States of America, but also in China, on whose market they particularly focus. In 2022,

the participation of this company was recorded at 16% in the total market share of China, which it intends to increase in the coming period. The management of Volkswagen believes that there is little chance of a possible conflict between China and Taiwan, which would negatively affect the position of their company. In Western Europe, the production of Volkswagen is in 2022. significantly reduced, primarily due to the lack of parts and the slowdown in their production. One of the major suppliers, Leoni, suspended the production of wire belts from the beginning of the crisis until the first half of 2022. in Ukraine, which was directly reflected in the reduction of car production during the period of production interruption. (https://europe.autonews.com/automakers/vw-shifts-output-north-america-china-ukraine-war-dampens-outlook - Retrieved 15/12/2023). In the second half of 2022, Leoni continued its production in Western Ukraine. Changes in the way of work followed, which adapted to the current situation. (Retrieved February 15, 2023, from https://europe.autonews.com/suppliers/leoni-says-ukraine-output-wire-harnesses-nearly-prewar-levels).

Due to the crisis in Ukraine, BMW produced 6,500 fewer vehicles in the city of Dingolfing. The number of cars produced also decreased in Munich. Bottlenecks in the production of microchips affected the reduction of production. However, despite this fact, the sale of BMW cars in the USA and in the period of crisis (specifically in the first quarter of 2022) increased by 3.2%. (Retrieved January 20, 2023, from https://www.bmwblog.com/2022/04/02/bmw-march-production-loss-ukraine-war/).

In order to reduce the consumption and use of natural gas, which is in short supply, Mercedes has started switching to electric and other energy sources in order to solve the problem and continue production at full capacity. The German government has launched a plan for crisis management and rational management of gas consumption. The construction of a wind farm is also planned, which would provide 85% of electricity needs. An agreement was also signed for the use of facilities on the Baltic Sea, as an additional source of supply. In addition to leaving the Russian Federation, not all German-made brands currently export cars to the mentioned country. (https://europe.autonews.com/automakers/mercedes-forced-cut-shifts-european-plants - Retrieved 22 /01/2023).

Mercedes left the Russian market relatively recently, if its production in the Russian Federation is observed (8 months after the beginning of the war). (Retrieved January 25, 2023, from https://www.cbsnews.com/news/ford-mercedes-benz-russia-ukraine-exit/).

Based on the above, the current situation in the world is very bad when it comes to supply chains. The Ukrainian sea is closed, which means the blockade of a large number of ships. The areas around the Black Sea and the Azores are congested and there is no possibility of easy transportation. Ports in the cities of Odessa and Mariupol (Odessa, Mariupol) are often closed. In addition to water transport, a similar situation exists in air transport. The problem of finding alternative suppliers outside Eastern Europe can be clearly seen in the example of neon gas, which in order to be used must be purified to 99.9% purity, a complex and time-consuming process that only a few companies in Europe can carry out, outside Odessa where its largest production is located. Russian and Ukrainian seafarers make up 14.5% of the world's total shipping workforce. As the Russian Federation is excluded from the "SWIFT" system, there is a problem of paying workers, in addition to the discouragement that exists in terms of business security. The Russian Federation can be said to be the "gas station" of the world. When it closes, Europe finds itself in a big problem, bearing in mind that it is supplied with about 40% of its natural gas and about 25% of its oil from the Russian Federation. (Nguyen H. et al, 2022).

The pressures and sanctions from the European union and the United States of America did not start in 2022. already much earlier, even before the 2014 crisis. The Russian Federation today, as a countermeasure, states the possibility of introducing the Russian ruble as a means of payment for all goods traded with the Russian Federation, which will strengthen it while rival currencies will be constantly and continuously devalued. Such a situation would only have a more unfavorable effect on the countries from which the sanctions were imposed. (Retrieved January 27, 2023, from https://www.just-auto.com/features/ukraine-auto-market-impact/).

The current situation requires the necessity of creating alternative sources of supply, the so-called "supplier B" and even "supplier C". In this way, by increasing the number of possible suppliers and not relying on only one supply source, the likelihood of supply chain disruptions and delays that increase the price of transported goods will be reduced. In addition, a greater reliance on local rather than distant suppliers is recommended. (Retrieved January 29, 2023, from https://www.cips.org/supply-management/opinion/2022/july/ukraine-war-battling-with-supply-chain-disruption/).

Conclusion

Supply chains represent a topic that occupies the attention of a large number of scientists. They define them in different ways while maintaining the same meaning, so they can be understood as the process of delivering raw materials and materials to end consumers. In order for supply chains to function effectively, it is necessary to adequately manage the entire flow of goods, from procurement, through production to final delivery.

With the development of the crisis in Ukraine, there was a deterioration of macroeconomic indicators around the world, especially in Europe. There is a decrease in GDP as well as an increase in inflation. Living standards are decreasing, which is causing protests across European countries. The European union is suffering great damage, primarily due to the introduction of sanctions against the Russian Federation and the inability to supply gas from this country. Also, there is a withdrawal of European companies from these markets, which leads to them giving way primarily to Chinese companies.

After the exit of the European giants, they see a great void and opportunity. On the other hand, the European giants are experiencing negative consequences, due to the withdrawal from the Russian market, as well as the inability to obtain parts for the production of cars in Europe in their factories. Chinese companies not only occupy a large market, but also use all other benefits. In addition to three domestic companies, currently all others are companies from the Chinese market.

The future of supply chains will depend on the ability to find alternative suppliers (one or more). Also, finding new, alternative sources of supply as well as evaluating the possibility of supply from their own or neighboring countries is also an option that companies must consider. It is believed that in the future, Chinese companies will continue to expand their business to the war zones, which will have a positive impact on the income of these companies, if the current trend continues in the future. However, due to the uncertainty of the current situation, the future course of events in any industry, including the automotive industry, cannot be predicted with certainty.

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