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Entrepreneurs' strategic response to COVID-19 limitations: Ukrainian experience

Стратешки одговор предузетника на ограничења COVID-19: украјинско искуство

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Abstract: COVID-19 quarantine limitations and their effects on business lead to unpredictable environment changes, which require appropriate entrepreneurs' strategic response. COVID-19 quarantine limitations dramatically affected specialized businesses, which had to adopt for the new environment requirements. COVID-19 especially influenced small and medium size entrepreneurs, which are specialized in one industry. Considering the peculiarities of integration and diversification as priority strategies for business development in the new reality, the article proves that specialization in goods or services in one industry for small and medium enterprises is risky and can lead to the bankruptcy of such businesses. Based on official statistics, the changes in Ukrainian small and medium companies' performance during years 2019-2020 were studied across industries. The gathered data provide evidence that companies which specialized in one industry or business activity suffered from the crisis most of all. According to the forecasts, COVID-19 will affect the economy over a number of years. That is why business has to adopt for the new reality. Using diversification strategies for small and medium size businesses is recommended in order to survive and grow.
Keywords: entrepreneurship, business strategies, COVID-19
JEL classification: M13

Сажетак: Ограничења карантина COVID-19 и њихови ефекти на пословање доводе до непредвидивих промена окружења, које захтевају одговарајући стратешки одговор предузетника. Ограничења карантина ЦОВИД-19 драматично су утицала на специјализована предузећа која су морала да усвоје нове захтеве околине. Нарочито је COVID -19 утицао на мале и средње предузетнике који су специјализовани за једну индустрију. Узимајући у обзир особености интеграције и диверзификације као приоритетне стратегије за развој пословања у новој стварности, чланак доказује да је специјализација у робама или услугама у једној индустрији за мала и средња предузећа ризична и да може довести до банкрота таквог пословања. На основу званичне статистике, проучаване су промене у учинцима украјинских малих и средњих предузећа током 2019-2020 по индустријама. Подаци показују да су компаније које су се специјализовале за једну индустрију или пословну активност највише претрпеле од кризе. Према предвиђањима, COVID -19 ће утицати на економију током неколико година. Због тога бизнис мора усвојити нову стварност.

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Препоручује се употреба стратегија диверзификације за мала и средња предузећа како би опстали и расли.
Кључне речи: предузетништво, пословне стратегије, COVID-19
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Introduction

Coronavirus infection has intensified the volatility, uncertainty, complexity, and ambiguity of the VUCA world, to which corporations and SMEs have begun to adapt their strategies through long-term lockdown and restrictive anti-epidemic measures (Cabinet of Ministers of Ukraine, 2020) to prevent the spread of COVID-19 disease caused by the coronavirus SARS-CoV-2. Neither governments in the world, nor global corporations, or entrepreneurs expected such a scenario. In addition to global problems related to the reduction of GDP and world trade, no less significant were the problems of transferring workers to remote work and their opportunities as a result, the inability of top and HR management of small and medium companies to organize and effectively manage employees remotely. Other barriers include reduced business activity and increased turbulence in industry markets, deteriorating logistics, changing customer experience and the transition of business and customers online, and thus the inability of ISPs to provide quality services to their customers due to increased network load.

According to experts, the country's GDP, especially in the period of quarantine restrictions, is strongly correlated with the spread of Internet access. According to the estimation of the State Statistics Service, the population of Ukraine is 41.9 million as of January 1, 2020 (State Statistics Service of Ukraine, 2020a). According to the research conducted by Factum Group Ukraine, 22.96 million people (71.0 percent) regularly use the Internet, and 21 million people (65.0 percent) have access to the Internet at home (mind.ua, 2019). Thus, this indicates a fairly high level of Internet availability in Ukraine. Nevertheless, according to statistics, the deterioration of the epidemic situation and the periodic tightening of quarantine restrictions have significantly hampered the recovery of Ukraine's economy in 2020. The decline in economic indicators was primarily due to a reduction in consumer demand and business expectations, although the external situation remains predominantly favourable for Ukrainian enterprises.

Ukraine's real GDP declined by 1.3 percent in Q1 2020 and by 11.4 percent in Q2. The year-on-year decline was 3.5 percent in Q3 2020 (National Bank of Ukraine, 2020). The main factor in the deepening decline in GDP was also a decrease in domestic consumption, falling investment, and deteriorating exports. Agriculture also made a significant contribution to the fall in GDP, as this area cannot be transferred online. Partial compensators from the state were the relaxation of fiscal policy (implementation of the program of cheap and affordable loans, when UAH 16 billion of loans were provided to 7,000 enterprises and entrepreneurs), an increase of state budget expenditures on social support, medicine, and infrastructure projects within the President’s program "Big Construction", which became one of the most important areas of economic support. However, SMEs need to rethink their mission, vision, and values and pay more attention to reviewing or shaping a new strategy for survival and development in the future.

The problem is the necessity to give recommendations to entrepreneurs how to adapt to the New Normal due to COVID-19 quarantine limitations. We propose developing and implementing appropriate business strategies. The research question is "What business strategies will allow entrepreneurs to adapt to work under quarantine restrictions?" The aim of this research is to generalize the theoretical background of entrepreneurial strategies during the negative environmental changes, analyse the COVID-19 influence on Ukrainian companies and develop recommendations on successful business strategies for entrepreneurs during the pandemic.

1. Business strategies: historical overview

Using the concept of "center of gravity", proposed by Tregoe and Zimmerman (1980) and developed by Galbraith (1980), it is possible to analyze the evolution of business strategies. In accordance with the concept, this center of gravity arises where the enterprise has achieved success. The center of gravity depends on where in the supply chain of the industry the company started its activity (raw materials extraction, primary processing, processing, final product production, brand production, distribution, and retail). A company needs fundamentally different skills and abilities depending on its position in this chain to achieve a competitive advantage. For enterprises that are primarily engaged in the extraction of raw materials, it is primary and subsequent processing; the key success factors are product standardization (homogenizatio

n), cost reduction, process innovation, rational supply schemes, engineering, sales volumes, functional or linear connections. For businesses further down the industry's supply chain, opposing skills or functions are important: customer segmentation, product innovation, research and development and marketing, pursuing a profitable market niche, creating profit centers.

If an enterprise was created at a certain link in the industry supply chain, it possesses a certain set of skills and abilities that are critical for this particular activity. Therefore, any strategic changes should be viewed precisely from the point of view of how it affects the center of gravity of the enterprise. If changes in strategy require a change in the company's center of gravity, such changes are the most radical, require changes in the skills and abilities that the enterprise possesses, and the implementation of such strategies is the most difficult.

The first strategic change for the enterprise is vertical integration within the industry. This change usually does not change the center of gravity. For example, in the pulp and paper industry there may be enterprises with different centers of gravity (specializing in pulp, paper rolls, wrapping paper, napkins, etc.), accordingly, with different strategies and organizational structures.

The center of gravity forms the basis from which strategic change begins. Once the industry has matured, entrepreneurs may change the center of gravity, find a niche where profitability is higher, or move to another industry with the same center of gravity, etc. Diversification into related products occurs along the industry chain. At the same time,

neither the industry nor the center of gravity changes. The company is looking for additional sources of income and profit. As for relative diversification, the company enters other industries, but with a similar center of gravity. We could take Procter & Gamble as an example. Starting with soap production, the company integrated vertically back into the chemical industry, and then, in search of growth opportunities, diversified into the paper, food, and pharmaceutical industries. All new industries are producing consumer goods under the management of brand managers. 3M is also relatively diversified, but based on technology. About 40,000 different products are manufactured in 70 divisions, but 95 percent of the products are based on encompassing and related technologies. The center of gravity is the product manufacturer, and value is added through research and development.

Related diversification is a movement into new industries with different centers of gravity, between which, however, there is a connection. For example, a papermaker moves into the chemical industry, selling cellulose products as well as producing dyes. Such diversification gives nothing to the center of gravity, but is seen only as the creation of separate centers of profit. Unrelated diversification is similar to related, but this is a movement to other industries with different centers of gravity. The goal is risk diversification. Changing the center of gravity is possible without changing the industry.

Chronologically, startups focus on the niche i.e. a specialized, one-product business. As business grows successfully, integration and diversification strategies are used. Vertical integration strategy allows to strengthen the company's market position and take the control under the supply or distribution of goods. The strategic goal of horizontal integration is to move to a better strategic position in the market, additionally saving costs due to the large scale operations. Diversification strategies help to share risks and increase profit. The "gold age" of vertical integration strategies was in the first half of the 20th century, when diversification strategies dominated as the most profitable (Thompson & Strickland, 1996). Many authors (Ohmae, 1983) recommended focussing on the few stages of the value chain, where companies have core competencies and competitive advantage, and buy or subcontract other products or services.

However, beginning from 1990, due to the problems with supply from many subcontractors and globalization process, the advantages of specialized business increased (Hagel & Singer, 2000; Birch & Burnett-Kant, 2001). Many global companies began to cut down on their non-core businesses. The unpredictable quarantine limitations and lockdown, introduced all over the world in 2020 due to COVID-19, showed the risks of specializing in one business/industry/product/service activities. The hall industries had to make a break in their work. The actuality and advantages of diversified activities are actual again.

According to Ewa Izabela Stańczyk-Hugiet (2013), four types of companies' strategic response to environmental changes are possible depending on the strategic orientation of business: inertial adaptation, reactive adaptation, anticipatory adaptation and creative adaptation. Inertial adaptation is used in order to keep status quo and take minimal effort to respond to changes. This approach may be recommended in the short term period of uncertainty, when it there is no sense in making quick decisions. Reactive adaptation is choosing the defense strategy to survive. This is an example of strategic response to high

pressure from the environment. However, in the long run, such passive response may be dangerous for a company's future. Anticipative adaptation is action in the emergency conditions, but grounded on forecasted environmental change. This type of strategic response has to be well-grounded in analysis and future trends predictions. Creative adaptation is an example of proactive strategy, oriented on use of opportunities.

In fact, all types of strategic response may be used by businesses in COVID-19 conditions. Inertial and reactive adaptation are passive answers to environmental changes. In some industries they may be recommended as short-term reaction to unpredictable changes. But, if the critical external changes are prolonged, successful business strategies have to be proactive, such as anticipative or creative adaptation.

Other researchers (Li-Ying & Nell, 2020) propose a framework with four possible scenarios for innovation and entrepreneurship in order to minimize the negative impact of COVID-19. The scenario choice is depended on two variables: firstly, the businesses' value chains changes; secondly, changes in the market according to Schumpeter's creative destruction and creative accumulation as fundamental mechanisms of innovation and entrepreneurship. According to the framework, four types of business opportunities and corresponding strategies may be chosen. For the companies with disrupted downstream value chain and creative accumulation intersection the impact of COVID-19 does not affect the cash flow immediately. The consolidation strategy may be recommended when investing in R&D for product and service innovation in the long run. Another type of companies, "option makers" use creative destruction as a response to value change due to downstream disruption. Different customer-centric creativity actions aimed to save their customers and deliver them services during or after the crisis (pandemic) may be taken. "Newcomers" are companies that enter an existing market in which the upstream supply chain was damaged, and propose their existing or adopted products for other consumers' needs. Agility is the key success factor in this case. "Reorganizers" may be successful in process innovation due to creative accumulation in industries with the problems in supply chain.

As Ratten V. (2021) mentioned, entrepreneurship in COVID-19 situation has to be used to implement crisis management strategies. In the times of quarantine limitations, the mobility of business as a result of world economy globalization and internationalization was significantly decreased. As a result, business strategies have to adapt to new conditions: digitalization of the work, where it is possible, i.e. transfer to a digital business model. Digital marketing and digital communications are an important part of the business strategy during the crisis. This conclusion is proved by the research conducted among Saudi entrepreneurs (Alessa, Alotaibie, Elmoez, & Alhamad, 2021). As witnessed from the answers, 60 percent of respondents agreed completely, and 30 percent agreed that coronavirus pandemic forced them to work online; more than 82 percent agreed that coronavirus pandemic lead entrepreneurs to use social media to communicate with customers; finally, 80 percent argued that coronavirus pandemic is considered by them to be a chance to develop entrepreneurs' business operations in the future.

Research of investment strategies in pandemic situation (Kostin, Runge, & FAdams, 2021) proved that emerging markets do not perform in a better way than developed markets. So, it may be treated as a positive effect of COVID-19 on investment strategies' return.

2. COVID-19 quarantine limitations and their impact on business in Ukraine

Entrepreneurship in Ukraine developed dynamically in the period 2010-2019, which was accompanied by several economic and political crises, and now entrepreneurship is well developed in Ukraine. According to the official statistics, 95.2 percent of total companies' number are small, including 82.3 percent micro business (Tables 1, 2). Small business gives 19.5 percent of total sales and involves 27.9 percent of the total number of employees. At the same time, at such industries, as agriculture, fishing and forestry; construction; trade; transport, post, delivery; hotels and restaurants more than 90 percent of companies are small. Nearly one half of industry sales in construction is delivered by small business, and 60.2 percent of total construction employees' number work in the small companies. Nearly half of total hotels and restaurants employees' number are involved in small business. So, the impact of entrepreneurs to the GDP of Ukraine is sufficient.

Quarantine limitations were introduced in Ukraine from March, 12, 2020, and lockdown continued until May, 11, 2020. This period was very hard for most of the businesses, especially for tourism, hotels and restaurants, arts, sports and recreation (Table 3).

Table 1: Small business structure in Ukraine by industries in year 2019

Industry	Small business		
	% of the corresponding industry number of companies	% of the corresponding industry sales	% of the corresponding industry number of employees
Total	95.2	19.5	27.9
includes:			
Agriculture, fishing and forestry	95.4	37.6	39.8
Industrial production	89.1	6.8	13.7
Construction	97.1	49.5	60.2
Trade	96.7	22.5	37.6
Transport, post and delivery	93.2	17.3	14,0
Hotels and restaurants	96.5	3.7	48.3

Source: State Statistics Service of Ukraine, 2020b

Table 2: Micro business structure in Ukraine by industries in year 2019

Industry	Including Micro business		
	% of the corresponding industry number of companies	% of the corresponding industry sales	% of the corresponding industry number of employees
Total	82.3	6.6	14.3
includes:			
Agriculture, fishing and forestry	84.9	12.0	18.8
Industrial production	68.8	1.6	4.8
Construction	81.5	17.2	31.8
Trade	85.6	7.3	20.2
Transport, post and delivery	76.6	6.7	7.0
Hotels and restaurants	7.9	14.3	25.7

Source: State Statistics Service of Ukraine, 2020b

Table 3: The volume of sold services by types of economic activity in the I-II Quarters of 2020 (mln UAH)

Activities	I Q. 2020	II Q. 2020	II Q. to I Q., %
Total	226974.2	192744.2	84.92
Post services and Express delivery	2226.4	2366.0	106.27
Hotels	1710.5	430.8	25.19
Restaurants	3651.2	1826.9	50.04
Veterinary	160.9	187.9	116.78
Tourism	1499.7	126.6	8.44
Arts, sports and recreation	1622.6	546.3	33.67

Source: State Statistics Service of Ukraine, 2020b

If the total decrease of sold services in the second quarter, 2020 was nearly 15 percent, in tourism the shrinkage was about 92 percent, in hotels – 75 percent; arts, sports and recreation – 66 percent, restaurants – 50 percent. At the same time, sales of post services and express delivery increased by 6.3 percent and veterinary services by 16.8 percent. This is evidence that quarantine is a threat for one group of industries and a possibility for the others.

The passenger traffic was also limited during the lockdown; its services declined nearly by a half (Table 4).

Table 4: Passenger traffic by transport during January-August 2020, in million passenger-kilometers

By type of transport	Passenger traffic	
	In % if compare with January – May 2019	In % if compare with January – August 2019
All transport	48.4	45.3
Railways	38.2	37.1
Automobile	54.6	55.9
Water	0.7	14.1
Air	45.4	33.8
Trams	65.6	67.9
Trolley Buses	62.6	63.3
Metro	48.3	54.2

Source: State Statistics Service of Ukraine, 2020b

Especially big decline was at metro, railways and air transport due to the complete stop of metro traffic in many cities, as well as restriction of air and railways connection between cities in the country and abroad. According to the official statistics, unemployment rate increased not substantially, only by 1.4 percent (table 5).

Table 5: Unemployment Rate (according to the ILO methodology)

Unemployment rate	IV Q. 2019	I Q. 2020
Among working age people, %	9.0	8.9
Thousands of people	1564.4	1548.6

Source: State Statistics Service of Ukraine, 2020b

If, however, we analyze the number of vacancies, published on the site work.ua, their number declined from 54,000 on March, 12, 2020 to 22,800 on April, 26, 2020. If we take into account the decline in the most industries sales, the real unemployment rate had to grow at least by one third.

3. Entrepreneurs' adaptation to the quarantine limitations

When one set of industries and businesses are closed or declined during the quarantine, others have the opportunity to grow and expand. The impact of COVID-19 on business can be assessed in different ways, but it has certainly become a powerful driver for the entire retail business to implement innovations that have been delayed until now. We can analyze a few examples how entrepreneurs survived during the lockdown. The Cinema Planet cinema network, which was closed for two months, has a sideline business – their own popcorn production. So, they proposed the delivery of popcorn in order to provide income. At the same time, they asked to buy the certificates, which consumers may exchange for any ticket to the cinema after the quarantine at a very profitable rate. This action also aimed to gather some earnings to support their business when it was closed. Restaurants offered food delivery if it was impossible to meet customers in the room. Small shops, which were closed, offered the delivery of goods to consumers. Online ordering of the most of goods and services and their delivery by post or courier became the most popular way to survive during the quarantine for the most entrepreneurs.

Also, the pandemic and quarantine accelerated the digitalization of retail in Ukraine. Quarantine restrictions have caused unprecedented growth in the e-commerce market. According to SalesForce, online sales in the world increased by 71 percent in Q2 of 2020. The same trend is observing in Ukraine. According to the CBR, the number of Ukrainian Internet users, who bought online, increased by 6 percent to 9.1 million people in the first half of 2020, 16 percent of whom ordered food delivery, 20 percent – ready meals. In response to quarantine and increased security requirements, national retailers (ATB, Silpo, Fora, Varus, Prostor, etc.) have launched their online platforms. Leading Ukrainian food retailers ATB and Silpo have launched a "click & collect" service, when consumers can order goods online and pick up an order at the nearest store by paying on the spot. They also launched the "scan & go" service. This service allows the buyer to scan the barcode of the product by phone, put them in the cart, and at the checkout to show the QR code and pay for all purchases. Growth in online sales and omnichannel scenarios is also observed in other segments. The leader of Ukrainian non-food retail, Epicenter hypermarkets specializing in the trade of materials for construction and repair, also significantly increased the share of online sales during the quarantine period. If at the end of 2013 online trade accounted for 3 percent of the company's sales structure, in the last three months of 2020 it increased to 10 percent. During the quarantine, online sales with delivery increased by 224 percent, and with self-pickup - by 262 percent (Delo.review, 2020).

The Ukrainian government supported small and medium business with specific measures in response to the COVID-19 pandemic. Such measures, as partial unemployment programme (two-thirds of salaries paid to partially furloughed employees), increase of the minimum amount of unemployment benefits, unemployment status granted from first day of registration, support to the self-employed, flexible working hours, introduction of remote working regime, personal income tax deferral, rent relief, loan guarantees and grants and subsidies were used. The total amount of Fund to counter COVID-19 equaled UAH 66 billion or 1.7 percent of GDP. Ukraine has invested in a new partial unemployment programme for small and medium business to stem job losses, nearly 370,700 beneficiaries got this aid, which is about 6 percent of small and medium business employees. If compare with France or Denmark, 20-30 percent of small and medium business employees got such funding at the peak time (International Monetary Fund, 2020). To conclude, Ukrainian government had not enough funding to support entrepreneurs during the lockdown.

The safety and well-being of workers in the global emergency caused by COVID-19 must be the most important to the organizations' management. Employers are obliged to take care of the health and safety of their employees and to provide safe workplaces. Employers must be proactive to protect their employees and minimize the risk of spreading the virus. Management should support employees in a changing environment, develop a communication plan that is acceptable to all participants, and establish new ways to effectively interact and manage the situation in a particular business model. For example, Google has introduced additional weekends and a week without meetings to minimize offline communication between employees.

Conclusion

The evidence of the last year business practice proved, that specialized business is too risky. Companies have to diversify activities in order to survive in modern unpredictable external environment. Risk sharing between different businesses/industries will provide more save and reliable activities. Entrepreneurs have to find any possibility to earn money from any activity. Companies have to go online to work or take orders for the products or services. Thus, revision of mission, vision, and values, as well as the formation of a strategy of integration or diversification using such adaptive measures to COVID-19, as a social responsibility of organizations and their leaders, their flexible work and management remote teams, the possibility of employees to perform the duties outside the workplace, will allow Ukrainian SMEs to survive and further develop their business.

During COVID-19, it is especially important to pay attention to the study of strategic drivers of further innovative development of enterprises, taking into account modern patterns in marketing reactions of consumers and other stakeholders. This vision is due to the fact that, firstly, the dynamic innovative development of enterprises and offering a wide range of new products and services changes the patterns of speed of technological change and patterns of behavioral responses of modern consumers to such changes, that choose not directly innovative product/service, and an enterprise or organization that is able to meet best the existing need and provide additional benefits at a certain price; secondly, the question of the extent to which domestic consumers are willing to accept modern innovations and buy innovative products should be answered. In our opinion, in the context of COVID-19 quarantine restrictions, such an integrated approach will expand the opportunities for the development of enterprises and their stakeholders and will affect the vectors of transformation of sustainable innovative development of Ukraine's economy. The future research has to be devoted to generalizing of successful business adaptation to COVID-19 quarantine limitations and strategies, which lead to this result.

References

Alessa, A. A., Alotaibie, T. M., Elmoez, Z., & Alhamad, H. E. V. (2021). Impact of COVID-19 on entrepreneurship and consumer behaviour: A case study in Saudi Arabia. *Journal of Asian Finance, Economics and Business*, *8*(5), 0201–0210. https://doi.org/10.13106/jafeb.2021.vol8.no5.0201

Birch, D. J., & Burnett-Kant, E. (2001). Unbundling the unbundled. *Unbundling the Unbundled*, *4*, 12. https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/unbundling-the-corporation

Cabinet of Ministers of Ukraine. (2020, December 9). *On the establishment of quarantine and the introduction of restrictive anti-epidemic measures to prevent the spread in Ukraine of acute respiratory disease COVID-19 caused by coronavirus SARS-COV-2. Resolution № 1236*. Gov.Ua. https://www.kmu.gov.ua/npas/pro-vstanovlennya-karantinu-ta-zaprovadzhennya-obmezhuvalnih-protiepidemichnih-zahodiv-1236-091220

Delo.review. (2020, October 10). *How the pandemic and quarantine accelerated the digitalization of retail in Ukraine*. https://delo.ua/business/jak-pandemija-ta-karantin-priskorili-didzhitaliz-373710/?fbclid=IwAR1RCz693qFpyBh10BLReBAmeS7Ip1n_zVqc0vmIcCnMLn2NHO3Em98DJaQ

Galbraith, J. R. (1983). Strategy and organization planning. *Human Resource Management*, *22*(1-2), 63-77. https://doi.org/10.1002/hrm.3930220110

Hagel, J. III., & Singer, M. (2000). Unbundling the corporation. *Unbundling the Corporation*, *3*, 1. https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/unbundling-the-corporation

International Monetary Fund. (2020, October). *Job retention schemes during the Covid-19 lockdown and beyond*. OECD. http://database.ukrcensus.gov.ua/PXWEB2007/ukr/publ_new1/index.asp

mind.ua. (2019). *Almost 23 million Ukrainians regularly use the Internet*. https://mind.ua/news/20204323-majzhe-23-mln-ukrayinciv-regulyarno-koristuyutsya-internetom-doslidzhennya

Kostin, K., Runge, P., & Adams, R. (2021). Investment strategies in pandemic situations: An analysis and comparison of prospective returns between developed and emerging markets. *Strategic Management, 26*(1), 34–52. https://doi.org/10.5937/straman2101034k

Li-Ying, J., & Nell, P. (2020). Navigating opportunities for innovation and entrepreneurship under COVID-19. *California Management Review*. https://cmr.berkeley.edu/2020/06/innovation-entrepreneurship/

National Bank of Ukraine. (2020). *NBU Comments on Real GDP Change in Q1 2020*. https://bank.gov.ua/en/news/all/komentar-natsionalnogo-banku-schodo-zmini-realnogo-vvp-u-i-kvartali-2020-roku

Ohmae, K. (1983). *The mind of the strategist: Business planning for competitive advantage*. Penguin Books Australia.

Ratten, V. (2021). COVID -19 and entrepreneurship: Future research directions. *Strategic Change, 30*(2), 91–98. https://doi.org/10.1002/jsc.2392

Stańczyk-Hugiet E. I. (2013). *Evolutionary concepts and business strategy*. Conference Paper. June 2013. https://www.strategyskills.com/Articles/Documents/evolution.pdf

State Statistics Service of Ukraine. (2020a). *Demographic yearbook "population of Ukraine" for 2019*. http://database.ukrcensus.gov.ua/PXWEB2007/ukr/publ_new1/index.asp

State Statistics Service of Ukraine. (2020b). *Statistical information*. http://www.ukrstat.gov.ua/

Thompson, A. A., & Strickland, A. J. (1996). *Strategic management: Concepts & cases*. Irwin.

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Subsequent measurement of property, plant and equipment in hotel companies in the Republic of Serbia and the Republic of Croatia

Накнадно мерење некретнина, постројења и опреме у хотелијерским предузећима у Републици Србији и Републици Хрватској

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Abstract: The aim of this paper is to consider the practice of subsequent measurement of property, plant and equipment in hotel companies in the Republic of Serbia and the Republic of Croatia, i.e., to determine whether the preparers of financial statements make greater use of the historical cost model or the model based on fair value. The sample consists of 220 hotel companies in the Republic of Serbia and the Republic of Croatia, observing their financial reports for 2019. The research reveals that most hotel companies in both countries subsequently measure owner-occupied property and plant and equipment according to the historical cost model. Hotel companies in Serbia most often apply the fair value model for subsequent measurement of investment property, while hotel companies in Croatia most often apply the historical cost model in the same context. We also find that a large number of hotel companies in the observed countries do not disclose the basis for subsequent measurement of property (including investment), plant and equipment in the notes to their financial statements, which means that the quality of financial reporting on those assets in the hotel companies should be improved.
Keywords: subsequent measurement, property, plant and equipment, hotel companies, historical cost model, revaluation model, fair value model.
JEL classification: M41, M42

Сажетак: Циљ рада је да се сагледа пракса накнадног мерења некретнина, постројења и опреме у хотелијерским предузећима у Републици Србији и Републици Хрватској, тј. да се утврди да ли састављачи финансијских извештаја у већој мери користе модел историјског трошка или модел заснован на фер вредности. Узорак се састоји од 220 хотелијерских предузећа у Републици Србији и Републици Хрватској, при чему су посматрани њихови финансијски извештаји за 2019. годину. Истраживањем је

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утврђено да већина хотелијерских предузећа у обе земље накнадно мери некретнине различите од инвестиционих, постројења и опрему по моделу историјског трошка. Хотелијерска предузећа у Републици Србији најчешће примењују модел фер вредности за накнадно мерење инвестиционих некретнина, док хотелијерска предузећа у Републици Хрватској најчешће примењују модел историјског трошка у истом контексту. Утврђено је и да немали број хотелијерских предузећа у посматраним земљама не обелодањује основу за накнадно мерење некретнина (укључујући инвестиционе), постројења и опрему у напоменама уз финансијске извештаје, што значи да постоји значајан простор за унапређење квалитета финансијског извештавања о поменутим средствима у хотелијерским предузећима.
Кључне речи: накнадно мерење, некретнине, постројења и опрема, хотелијерска предузећа, модел историјског трошка, модел ревалоризације, модел фер вредности.
ЈЕЛ класификација: M41, M42

Introduction

Accounting information plays a key role in decision making in the business world (Mamić Sačer & Zyznarska-Dworczak, 2020). As the most important products of the company's accounting function financial statements are the main source of this information (Mitrović et al., 2015; Vasilev et al., 2019). Measurement (valuation) of the financial statements positions is one of the key problems in preparation of financial statements (Procházka, 2011). The measurement process, together with the recognition process, directly affects the financial position and performance of the company (Karapavlović, 2020). In relation to assets and liabilities, there are problems of a) initial and b) subsequent measurement, while in the case of income and expenses, the problem of measurement occurs only in the context of their initial recognition (Karapavlović & Obradović, 2020).

The historical cost concept and the fair value concept are the most common concepts for measuring economic categories in accounting theory and practice (Perčević et al., 2020). The concept of historical cost, as the oldest concept, implies that assets are measured in the amount of reimbursement provided for their acquisition, and liabilities in the amounts received in exchange for the obligation (Stojanović, 2016). In other words, the application of the historical cost concept implies ignoring current market prices when measuring assets and liabilities, but usually relies on costs incurred at the time of their acquisition, which more or less deviate from the economic reality, depending on market prices stability and time distance of transactions from the reporting day (Malinić, 2009, p. 310). In fair value accounting system, assets and liabilities are measured at their currently estimated values (Singh & Doliya, 2015, p. 64). Fair value, as a variant of current value, implies that assets and liabilities are measured by applying "visible" market inputs (mark-to-market), the most reliable of which are market prices in an active market, or by applying appropriate valuation techniques (mark-to-model). As Radić (2012) points out, fair value is the estimated sales (exit) value, while in the absence of market inputs, the discounted value obtained by applying certain valuation models are used.

The subject of this paper is the practice of subsequent measurement of property (both investment and owner-occupied), plant and equipment in hotel companies in the Republic of Serbia (RS) and the Republic of Croatia (RC). When measuring those positions of the statement of financial position (balance sheet) subsequently, preparers of financial statements choose between the cost model, based on the concept of historical cost, and the

revaluation model (for owner-occupied property, plant and equipment) or the fair value model (for investment property), as models based on the concept of fair value. The aim of this paper is to identify whether the preparers of financial statements of hotel companies in RS and RC prefer the cost model or the model based on fair value. In addition, the practice of subsequent measurement of these assets is considered in more detail in terms of the legal form of the company and the financial reporting basis.

The practice of subsequent measurement of property, plant and equipment (PPE) has been the subject of empirical research in RS and RC, as well as in other countries. The specificity of the empirical research in this paper is that the focus is on hotel companies, as well as on the fact that the financial reporting practices of selected companies (hotels) are compared in neighbouring countries where International Financial Reporting Standards (IFRS) have been applied for a relatively long time. Unlike previous empirical research on financial reporting practices for non-investment property, plant and equipment in the RS, the research in this paper includes companies that apply IFRS for small and medium-sized entities (SMEs), as companies that have relatively recently been able to choose a model for measuring these assets.

The paper is structured in five sections. After the introduction, we consider the regulatory framework for subsequent measurement of PPE in the RS and the RC. In the same section, we present the results of previous research and, based on these results, we develop the research hypotheses. In the third section, we describe the research sample and methodology. The fourth section presents the results of the conducted empirical research. In the last section, we provide concluding remarks are the limitations of research in the paper, as well as directions of future research.

1. Literature review

In the RS, the issues of recognition and measurement of the financial statements positions are regulated by: a) full IFRS, b) IFRS for SMEs, and c) the Ordinance of the Ministry of on recognition, measurement and presentation and disclosure of positions in individual financial statements of micro and other entities. Under the Accounting Law of 2013, as the law applicable for 2019 financial statements, which are analysed in the paper, the following entities are required to apply full IFRS: a) large companies, b) financial institutions, c) companies that prepare consolidated financial statements, and d) listed companies and those in the preparation for listing. According to this law, medium-sized companies choose between full IFRS and IFRS for SMEs, small companies apply IFRS for SMEs, while micro-companies and entrepreneurs choose between the Ordinance and IFRS for SMEs. In the RC, the issues of the financial statement positions recognition and measurement are regulated by: a) full IFRS as adopted by the EU and b) Croatian Financial Reporting Standards (CFRS). Under the Accounting Law of 2015, large companies and companies of public interest apply full IFRS, while micro, small and medium-sized entities apply CRFS. Table 1 shows the components of the regulatory frameworks for financial reporting in the RS and the RC regarding subsequent measurement of PPE which was applicable for 2019 financial statements.

Table 1: Regulatory framework for subsequent measurement of property, plant and equipment in RS and RC

	Full IFRS	IFRS for SMEs	Ordinance of the Minister of Finance of 2013 (RS)	CFRS (RC)
Owner-occupied property and plant and equipment				
Document / document section	IAS 16 – Property, Plant and Equipment	Section 17 – Property, Plant and Equipment	Article 14 – Long-term Tangible Assets	CFRS 6 – Long-term Tangible Assets
Models for subsequent measurement	Choice: cost model or revaluation model	Choice: cost model or revaluation model	Cost model	Choice: cost model or revaluation model
The effects of fair values changes	Other comprehensive income and equity (revaluation surplus) or profit/loss	Other comprehensive income and equity (revaluation surplus) or profit/loss	/	Equity (revaluation surplus) or profit/loss
Investment property				
Document / document section	IAS 40 – Investment Property	Section 16 – Investment Property	Article 15 – Investment Property	CFRS 7 – Investment in Property
Models for subsequent measurement	Choice: cost model or fair value model	Fair value model in general	Fair value model in general	Choice: cost model or fair value model
The effects of fair values changes	Profit/loss	Profit/loss	Profit/loss	Profit/loss

Source: the authors, based on the documents mentioned in the table header

As Table 1 shows, hotel companies, but also all other companies operating in the RS and the RC that prepare their general-purpose financial statements following full IFRS, IFRS for SME or CFRS, when subsequently measuring owner-occupied property, plant and equipment, choose between the cost model and the revaluation model. In other words, the mentioned forms of regulation provide the same possibilities for subsequent measurement of the mentioned assets (Széles et al., 2019). The first version of IFRS for SMEs, published in 2009, did not allow the right to choose – the cost model was mandatory. However, the second version of this document published in 2015, whose official Serbian translation was published in 2018, gives entities the right to choose between the cost model and the revaluation model. Entities in the RS that apply the 2013 Ordinance could only use the cost model in the context of preparing financial statements for 2019.

The considered regulatory bases define both models (cost and revaluation model) in the same way. Namely, the cost model implies measurement at cost less accumulated amortization and impairment losses, while the revaluation model involves measuring at fair value at the date of revaluation, provided that this value can be reliably estimated, less

subsequent accumulated amortization and impairment losses. The revaluation process is performed as often as necessary to prevent a material difference between the carrying amount and the fair value at the end of the reporting period. An increase in the carrying amount of an asset due to revaluation is included in revaluation surplus, as a component of equity, and other comprehensive income (if it is reported, which is not an obligation of companies in the RC applying CFRS) or in profit/loss, up to previously recognized revaluation loss on the same asset. A decrease in the carrying amount is included in profit/loss or decreases previously recognized revaluation surplus on the same asset.

Companies that follow full IFRS (in both countries) and CFRS (in the RC), when subsequently measuring investment property, can choose between the cost model, which is the same as for other (owner-occupied) property (and also plant and equipment), and the fair value model. Companies that apply IFRS for SMEs or the Ordinance (in the RS) use the fair value model. However, they use the cost model if excessive costs or efforts are necessary for reliable fair value estimation. Under the fair value model, an asset is measured at its fair value at the end of the reporting period. As it can be seen in Table 1, all companies in the RS and the RC, regardless of the financial reporting basis, include gains or losses from changes in fair values in profit/loss in the period of their occurrence. IAS 40 and CFRS 7 require companies using the cost model to disclose fair values of investment property in the notes to the financial statements.

The research conducted on a sample of 200 companies in the EU reveals that about 95% of the observed companies subsequently measure owner-occupied property and plant and equipment at the cost model (The Institute of Chartered Accountants in England and Wales – ICAEW, 2007). Cairns et al. (2011), based on a survey of 228 listed companies in the UK and Australia, point out that companies dominantly choose a cost-based model when they can opt between a fair value model and a cost model in the context of subsequent measurement of assets and liabilities. The results of the part of the survey related to owner-occupied property and plant and equipment are consistent with the general conclusion – a small number of companies use the revaluation model. Lourenço et al. (2015), based on a sample of 300 European companies applying full IFRS, find that most companies use the cost model in the same context. A survey conducted on a sample of 1,100 companies in South Korea reveals that about 18% of companies apply the revaluation model during 2008 and 2009 (Baek & Lee, 2016). Pobrić (2019), based on a sample of 190 companies in Bosnia and Herzegovina (B&H) that applied full IFRS for preparation of financial statements for 2017, finds that more than 75% of the observed companies use the cost model for all owner-occupied property and plant and equipment, about 15% use the revaluation model for the same assets, while about 8% use the revaluation model to measure some (not all) items of these assets.

A survey conducted on a sample of 300 companies in the RS in 2013 found that the largest number of companies (61%) use the cost model for subsequent measurement of owner-occupied property and plant and equipment (Obradović & Karapavlović, 2014), that 19% of companies apply the revaluation model, and that 12% of companies apply a mixed model, i.e., measure some assets according to the revaluation model, and others according

to the cost model. The research also reveals that 8% of the analysed companies did not disclose the model of subsequent measurement in the notes to the financial statements. The research conducted by Karapavlović et al. (2020) on a sample of 300 randomly selected companies in the RS that apply full IFRS and based on the financial statements for 2014, 2015 and 2016, confirms that the largest number of the observed companies, i.e. 57.8% on average, use the cost model, 15.6% use the revaluation model, 9.1% use both models, while 17.6% of the companies do not clearly disclose the model. On the other hand, based on a survey on a sample of 53 companies in RS, Pantelić (2019) reveals that about 76% of companies use the revaluation model, and about 24% use the cost model to measure the mentioned assets.

Observing 50 small processing companies in the RC, Tušek et al. (2018) find that 60% use the cost model to subsequently measure owner-occupied property and plant and equipment. Both models are applied by 14 companies, with the revaluation model most commonly used for property and the cost model for plant and equipment. The research reveals that only one company applies the revaluation model for all items of the observed assets, while 5 companies do not disclose the basis of subsequent measurement. Based on a survey conducted on a sample of 100 randomly selected medium-sized and large companies the real sector in 2016, Perčević et al. (2020) find that companies in the RC apply the cost model to a greater extent than the model based on fair values for subsequent measurement of assets and liabilities. In particular, they find that 16% of the observed medium-sized companies and 22% of large companies use the fair value model for subsequent land measurement, and 18% of medium-sized and 12% of large enterprises use the fair value model for subsequent measurement of buildings, plants and equipment.

The presented results of the studies, which were conducted in different countries and whose subject of observation were companies of different activities, indicate the dominance of the cost model in the context of subsequent measurement of owner-occupied property and plant and equipment. Based on this, we formulate the first research hypothesis as follows:

H_1: Hotel companies in the RS and the RC prefer the cost model for subsequent measurement of owner-occupied property and plant and equipment.

As noted earlier, Cairns et al. (2011) find a general dominance of the cost model as the basis for measuring assets and liabilities. However, they also find that investment property is an exception. Muller et al. (2008), on the basis of observing 77 companies in continental Europe, found that about 75% of them use the fair value model for subsequent measurement of investment property. Conducting a survey based on financial statements in the period from 2009 to 2013 of 110 companies listed on stock exchanges in EU countries, Mäki et al. (2016) find that 80% of companies use the fair value model. Conducting research on a sample of 96 randomly selected Chinese companies listed at the end of 2008, Taplin et al. (2014) find that one half (48) use the fair value model, while the other half use the cost model. The mentioned research in B&H (Pobrić, 2019) reveals that about 60% of the observed companies use the fair value model. On the other hand, some studies reveal a prevalence of the cost models. The aforementioned study of the ICAEW (2007) finds that

71.6% of companies in the EU subsequently measure investment property using the cost model. According to Prewysz-Kwinto & Voss (2016), who conducted a survey on a sample of 30 companies listed on the Warsaw Stock Exchange, about 63% of companies used the cost model in 2014.

A survey conducted on a sample of 233 manufacturing companies in the RS, based on financial statements for 2014, 2015 and 2016, finds that, on average, about 47% of companies that have investment property use the fair value model (Karapavlović et al., 2018). The same research reveals that the cost model is used by an average of 29% of companies, and that about 23% do not disclose the model of subsequent measurement in their notes to the financial statements. Pantelić (2019) finds that all observed companies in the RS apply the fair value model. The research conducted by Karapavlović et al. (2020) confirms that the largest number of companies in the RS that have investment property use the fair value model. On the other hand, research conducted by Pavić et al. (2016) on a sample of 132 non-financial companies listed in the RC, at the Zagreb Stock Exchange, find in 2013 that more than half of these companies that have investment property apply the cost model. Another research conducted in the RC (Perčević et al., 2020) reveals that 8% of the observed medium-sized and 15% of the observed large real sector companies apply the fair value model. Since research shows that companies in the RS more often use the fair value model than the cost model for subsequent measurement of investment property, and that in the companies in the RC it is the opposite, the second research hypothesis is as follows:

H_2: Hotel companies in the RS prefer the fair value model, while hotel companies in the RC prefer the cost model for subsequent measurement of investment property.

2. Research sample and methodology

The empirical research was conducted on a sample of 110 randomly selected hotel companies in the RS that apply either full IFRS or IFRS for SME and 110 randomly selected hotel companies in the RC (that apply either IFRS or CFRS). These are the companies whose activity code, in both countries, is 55.10 – Hotels and similar accommodation. We used the notes to the financial statements for 2019 to identify the accounting policies regarding the subsequent measurement of PPE, as well as balance sheets relating to the end of 2019 to identify the importance of PPE for companies. The mentioned financial statements are available on the official internet presentations of the Business Registers Agency of the RS and the Financial Agency of the RC. Hotel companies in RS that apply the Ordinance of the Minister of Finance are not included in the sample because they are not obliged to publish the notes to the financial statements. Therefore, the accounting policies of those companies related to the subsequent measurement of PPE could not be identified. The sample structure from the aspects of legal form and basis for preparing financial statements is shown in Table 2. This structure is used as a basis for a deeper analysis of accounting policies related to subsequent measurement of PPE, which aims to determine whether there are differences in the mentioned accounting policies between different types of companies. Data on companies in the sample were processed

using descriptive statistics. In the context of their interpretation, the method of comparison is used to a significant extent.

Table 2: Sample structure

		RS		RC	
		No.	%	No.	%
Legal form	Limited liability company	93	84.55	78	70.91
	Stock company	17	15.45	32	29.09
Financial reporting basis	IFRS	47	42.73	23	20.91
	IFRS for SMEs / CFRS	63	57.27	87	79.09

Source: authors' calculation

3. Research results and discussion

The share of owner-occupied property and plant and equipment in the total assets of the observed hotel companies in the RS ranges from 0.01% to 99.26%, with an average level of 65.70%. The share of the same assets in the total assets of the observed hotel companies in the RC ranges from 0.51% to 99.83%, with an average level of 67.84%. It follows that, in general, these assets have a very high share in the total assets of hotel companies in both the RS and the RC, which further means that accounting policies related to their subsequent measurement can significantly affect the reported financial position and performance. Therefore, hotel companies in the RS and the RC cannot afford to be indifferent regarding the choice of accounting policies in a given area. The average share of owner-occupied property and plant and equipment, in both countries, is higher in limited liability companies than in stock companies, with more pronounced difference between the mentioned legal forms in RS (66.76% vs. 59.87%) than in RC (69.14% vs. 67.54%). In the RS, companies that apply IFRS for SMEs have a higher share of the same assets compared to those that apply full IFRS (67.86% vs. 62.79%). On the other hand, in the RC, companies that apply full IFRS have a higher share of these assets than companies that apply CFRS (74.04% vs. 66.20%).

By analysing the content of the notes to the financial statements, we identify a large number of hotel companies in the RS and the RC (more than 30%) that did not disclose the model for subsequent measurement of owner-occupied property and plant and equipment or did not clearly do so. Table 3 shows that, in the companies that disclosed the measurement model, in both countries, the cost model dominates, with this dominance being more pronounced in the RC than in the RS. Specifically, when focusing only at companies that disclosed the measurement model, we conclude that 69.74% of these companies in the RS and 83.56% of these companies in the RC use the cost model for all items of owner-occupied property and plant and equipment. The share of companies that opted for the revaluation model for all items of this category of assets is significantly higher in the RS than in the RC. In the RS, this determination was expressed by 22.37% of companies that disclosed the measurement model, while in the RC, the same determination was expressed by only 5.48% of such companies. Simultaneous application of both models was observed in 7.89% of companies in the RS and 10.96% of companies in the RC that disclosed the

model of subsequent measurement. These companies mainly apply the revaluation model for the subsequent measurement of property (land and buildings), and the cost model for the subsequent measurement of plant and equipment. The presented data show that 23 observed hotel companies in the RS, i.e., 30.26% of the total number of companies that disclosed the measurement model, use the revaluation model at least for some items of owner-occupied property and plant and equipment. In the RC, 12 companies, i.e. 16.44%, did the same. Only 9 companies in the RS provided information on the person who estimated the fair values (certified appraiser in 5 cases and employees in 4 cases). Three companies in the RS disclosed that they estimated fair values using the depreciated replacement cost method, two that applied the yield method and two that applied the comparable price method. Eight (out of 12) hotel companies in the RC that use the revaluation model for at least some items of non-investment property, plant and equipment disclosed who determined the fair values (certified appraiser in all cases). Three companies in the RC used the method of depreciated replacement cost, while two used the method of comparable prices for the fair value estimation. The results of empirical research show that hotel companies both in the RS and the RC, when choosing a model for subsequent measurement of owner-occupied property and plant and equipment, follow the general preferences of companies in their countries, identified by previous research in the RS (Obradovic & Karapavlović, 2014; Karapavlović et al., 2020) and the RC (Tušek et al., 2018; Perčević et al., 2020).

Table 3: Subsequent measurement of owner-occupied property and plant and equipment in hotel companies in RS and RC

Model for subsequent measurement	RS		RC	
	No.	%	No.	%
Cost model	53	48.18	61	55.45
Revaluation model	17	15.45	4	3.64
Mixed model	6	5.45	8	7.27
Do not completely or clearly disclose	34	30.91	37	33.64
Total	110	100.00	110	100.00

Source: the authors' calculation

Table 4 shows that, in RS, the cost model is the dominant basis for subsequent measurement of owner-occupied property and plant and equipment of limited liability hotel companies, and that half of stock companies that have clearly disclosed the measurement model use only the cost model, while the other half uses the revaluation model at least for some items of the mentioned assets. Therefore, stock companies in the RS, in comparison to limited liability companies in the same country, use the revaluation model more frequently. This can be explained by the higher level of public accountability of stock companies, which results in a stronger need to provide more relevant information. In the RC, the cost model is dominant in both legal forms, and the dominance is somewhat more pronounced in limited liability companies (when only companies that clearly disclosed the measurement model are observed). In both countries, the share of companies that did not clearly disclose the measurement model is higher in limited liability companies. This, again, can be explained by a lesser degree of their public responsibility. However, a lower level of public accountability cannot be a justification for the lack of information on the

measurement model, especially given the general importance of PPE for hotel companies of all legal forms.

Table 4: Subsequent measurement of owner-occupied property and plant and equipment in hotel companies in RS and RC – sample segmentation according to the legal form of entities

Legal form	Model for subsequent measurement	RS		RC	
		No.	%	No.	%
Limited liability company	Cost model	46	49.46	41	52.56
	Revaluation model	11	11.83	2	2.56
	Mixed model	5	5.38	5	6.41
	Unknown	31	33.33	30	38.46
Stock company	Cost model	7	41.18	20	62.50
	Revaluation model	6	35.29	2	6.25
	Mixed model	1	5.88	3	9.38
	Unknown	3	17.65	7	21.88

Source: the authors' calculation

Table 5 shows that the cost model is dominant among hotel companies in the RS that use IFRS for SMEs, but not among hotel companies in the same country that use full IFRS. Specifically, when only companies that clearly stated the measurement basis are taken into account, we conclude that the number of those who use the revaluation model for at least some items of owner-occupied property and plant and equipment is higher than the number of those who use the cost model for all items of these assets. In the RC, the cost model dominates in both companies that apply full IFRS and those that apply CFRS, with this dominance being more pronounced among those that apply CFRS (excluding companies that did not clearly disclose the measurement model). The dominance of the cost model among companies in RS that apply IFRS for SMEs is undoubtedly influenced by the fact that these companies relatively recently, after the changes in the mentioned standard (which were incorporated into the regulatory framework in the RS with a significant delay), gained the right to apply the revaluation model. In other words, the vast majority of these companies did not switch to the revaluation model when the opportunity arose. In both countries, the share of hotel companies that did not disclose the measurement model is higher for companies that do not apply full IFRS (but IFRS for SMEs or CFRS), which is not surprising given the fact that full IFRS are intended for companies with greater public responsibility.

At the end of 2019, 24 hotel companies in the RS and 16 hotel companies in the RC have investment property. However, 9 hotel companies in the RS that prepared financial statements in accordance with IFRS for SMEs were excluded from further analysis, since these companies, as Table 1 shows, do not have the right to choose the accounting policy for subsequent measurement of investment property. The share of investment property in the total assets of hotel companies in the RS ranges from 0.52% to 89.31%, with an average of 25.9%. In three hotel companies in the RS, investment property accounts for more than 80% of total assets. In the RC, the share of investment property ranges from 0.10% to 59.89%, with an average of 8.44%. In both countries, the share of investment property is higher in stock companies than in limited liability companies (42.47% vs. 9.61% in the RS,

and 8.94% vs. 4.94% in the RC). In companies in the RC that use full IFRS, the average share of investment property in total assets is higher than in companies in the same country that use CFRS (8.27% vs. 3.96%).

Table 5: Subsequent measurement of owner-occupied property and plant and equipment in hotel companies in RS and RC – sample segmentation according to financial reporting basis

Basis	Model for subsequent measurement	RS		RC	
		No.	%	No.	%
Full IFRS	Cost model	16	34.04	14	60.87
	Revaluation model	13	27.66	0	0.00
	Mixed model	6	12.77	4	17.39
	Unknown	12	25.53	5	21.74
IFRS for SMEs / CFRS	Cost model	37	58.73	47	54.02
	Revaluation model	4	6.35	4	4.60
	Mixed model	0	0.00	4	4.60
	Unknown	22	34.92	32	36.78

Source: the authors' calculation

Table 6: Subsequent measurement of investment property in hotel companies in RS and RC

Model for subsequent measurement	RS		RC	
	No.	%	No.	%
Cost model	5	33.33	9	56.25
Fair value model	7	46.67	0	0.00
Do not completely or clearly disclose	3	20.00	7	43.75
Total	15	100.00	16	100.00

Source: the authors' calculation

Table 6 shows that a significant number of hotel companies in the RS (20%) and especially the RC (43.75%) did not provide information on investment property in accordance with regulations, since the basis of their subsequent measurement is not clearly disclosed in the notes to the financial statements. Of the companies in the RS that disclosed the measurement basis, most apply the fair value model. In the case of two hotel companies in the RS that use this model, the fair value is determined by a certified appraiser, while in one case it is done by an internal commission. One company stated that a certified appraiser or an internal commission estimated fair values. Three companies did not disclose who estimated the fair values. No company in the RS disclosed which method was used to determine fair value. On the other hand, all hotel companies in the RC that disclose the measurement basis use the cost model. No company in the RS and the RC using the cost model discloses the fair values of investment property in their notes to the financial statements. Given that the number of hotel companies with investment property is small, the segmentation of the sample from the aspects of legal form and basis for preparing the financial statements was not performed.

Conclusion

The research in this paper, conducted on a sample 220 hotel companies in the RS and the RC, reveals that hotel companies in these countries prefer the cost model over the revaluation model, as a model based on fair value, in the context of subsequent measurement of owner-occupied property and plant and equipment. This means that hotel companies in the RS and the RC, when choosing accounting policies for the subsequent measurement of the mentioned assets, behave similarly to companies of other activities in these and many other countries. Therefore, the first research hypothesis is confirmed. Nevertheless, the research in the paper shows that the revaluation model is more frequently used in hotel companies in the RS than in companies of the same activity in the RC.

Hotel companies in the RS more often choose the fair value model than the cost model for subsequent measurement of investment property. On the other hand, hotel companies in the RC more often choose the cost model in the same context. It follows that the second research hypothesis has been confirmed. However, given that, in both countries, a very small number of observed hotel companies have investment property, these results should be accepted with reservations.

The research results indicate national specifics in the accounting policies of hotel companies regarding the subsequent measurement of property, especially investment property, plant and equipment. Namely, models based on fair value (the revaluation model and the cost model) are more frequently used in hotel companies in the RS than in companies of the same activity in the RC.

The research also reveals that a significant number of hotel companies in the RS and the RC do not disclose, or do so but not clearly enough, the basis for subsequent measurement of PPE in the notes to the financial statements. This means that hotel companies in the RS and the RC do not fully comply with applicable standards. We also find that none of the companies in the RS and the RC that use the cost model disclose the fair value of investment properties, as required by the applicable standards. In this regard, the results of the research in the paper are in line with the results of previous research, which indicate a significant space for improving the practice of disclosing information in the notes to the financial statements of companies in these countries. In other words, hotel companies in the RS and the RC are no exception.

The limitation in the paper is the stated fact that a relatively small number of hotel companies in both countries have investment property. The paper raises numerous questions in relation to subsequent measurement of PPE, but also other items of financial statements where there is a choice between a model based on historical cost and a model based on fair value. Further research in this area should focus on examining the motives of companies to choose a model of subsequent measurement of PPE. In this regard, it would be useful to investigate the impact of the origin of the company's capital, profitability levels, (under)development of the market for items that are the subject of measurement, and the education of accountants on the choice of the measurement model. The results of future research in the field of subsequent measurement of PPE in the RS may be affected by

recent changes in regulation. The Accounting Law of 2019 enables all micro and small companies to apply full IFRS, which, above all, can influence the practice of subsequent measurement of investment property. In addition, the same law imposes an obligation on all micro-companies (not micro-entrepreneurs) to prepare the notes to the financial statements, which will enable a wider range of companies to be included in future research. Finally, the Ordinance of the Ministry of Finance, adopted in 2020, gives micro companies the opportunity to choose between the cost models and the revaluation model in the context of subsequent measurement of owner-occupied property and plant and equipment, which was not possible according to the previous Ordinance (of 2013).

References

Baek, H.Y., & Lee, D.Y. (2016). Motives for and effects of asset revaluation: an examination of South Korean data. *Emerging Markets Finance and Trade*, *52*(12), 2808-2817. Doi: https://doi.org/10.1080/1540496X.2016.1209360

Cairns, D., Massoudi, D., Taplin, R., & Tarca, A. (2011). IFRS fair value measurement and accounting policy choice in the United Kingdom and Australia. *The British Accounting Review*, *43*(1), 1–21. Doi: https://doi.org/10.1016/j.bar.2010.10.003

Karapavlović, N. (2020). Specifičnosti revizije pozicija finansijskih izveštaja merenih po fer vrednosti. *Računovodstvo*, *64*(1-2), 55-80.

Karapavlović, N., & Obradović, V. (2020). Računovodstvo fer vrednosti u Evropskoj uniji i Republici Srbiji. In D. Despotović, G. Milovanović, S. Savović, D. Rejman Petrović & Z. Đurić (Red.), *Aktuelni makroekonomski i mikroekonomski aspekti evropskih integracija Republike Srbije* (str. 483-498). Kragujevac: Ekonomski fakultet Univerziteta u Kragujevcu.

Karapavlović, N., Obradović, N., & Milutinović, S. (2018). Financial reporting of investment properties in Serbian manufacturing enterprises. In V. Babić (Ed.), 5th *International Scientific Conference Contemporary Issues in Economics, Business and Management* (pp. 445-454). Kragujevac: Faculty of Economics University of Kragujevac.

Karapavlović, N., Obradović, V., & Bogićević, J. (2020). The use of historical cost and fair value for property and plant and equipment measurement: Evidence from the Republic of Serbia. *Economic Annals*, *65*(227), 95-118. Doi: https://doi.org/10.2298/EKA2027095K

Lourenço, I.C., Sarquis, R., Branco, M.C., & Pais, C. (2015). Extending the classification of European countries by their IFRS practices: a research note. *Accounting in Europe*, *12*(2), 223–232. Doi: https://doi.org/10.1080/17449480.2015.1111520

Mäki, J., Somoza-Lopez, A., & Sundgren, S. (2016). Ownership structure and accounting method choice: a study of European real estate companies. *Accounting in Europe*, *13*(1), 1–19. Doi: https://doi.org/10.1080/17449480.2016.1154180

Malinić, D. (2009). Računovodostvo fer vrednosti i volatilnost finansijskih izveštaja u uslovima finansijske krize. *Ekonomika preduzeća*, *57*(7-8), 308-326.

Mamić Sačer, I., & Zyznarska-Dworczak, B. (2020). Assets measurement principles according to Croatian and Polish accounting standards. *Croatian Economic Survey*, *22*(1), 41-64. Doi: https://doi.org/10.15179/ces.22.1.2

Mitrović, A., Knežević, S., & Veličković, M. (2015). Ratio analysis specifics of the family dairies' financial statements. *Economics of Agriculture*, *62*(4), 1061-1078. Doi: https://doi.org/10.5937/ekoPolj1504061M

Muller, K.A. III, Riedl, E.J., & Sellhorn, T. (2008). Consequences of voluntary and mandatory fair value accounting: evidence surrounding IFRS adoption in the EU real estate industry. *Working Paper* 09-033, Boston: Harvard Business School.

Obradović, V., & Karapavlović, N. (2014). Finansijsko izveštavanje o nekretninama, postrojenjima i opremi u Srbiji. *Računovodstvo*, *58*(11-12), 38-50.

Pantelić, M. (2019). Implementation of fair value accounting in Serbia: empirical research. *Ekonomika preduzeća*, *67*(5-6), 345-355. Doi: https://doi.org/10.5937/EKOPRE1906345P

Pavić, I., Mamić-Sačer, I., & Brozović, M. (2016). Do Croatian quoted companies satisfy IFRS disclosure requirements of accounting estimates for investment property?. *Procedia Economics and Finance*, *39*(2016), 389-398. Doi: https://doi.org/10.1016/S2212-5671(16)30340-9

Perčević, H., Hladika, M., & Valenta, I. (2020). The analysis of the appliance of fair value concept in Croatian companies from real sector. In: M.H. Bilgin, H. Danis & Demir E. (Eds.), *Eurasian Economic Perspectives. Eurasian Studies in Business and Economics*, *14*(1), 17-29. Cham: Springer. Doi: https://doi.org/10.1007/978-3-030-53536-0_2

Pobrić, A. (2019). The application of fair value accounting in Bosnia and Herzegovina. *Acta Economica*, *17*(31), 149-167. Doi: https://doi.org/10.7251/ACE1931149P

Prewysz-Kwinto, P. & Voss, G. (2016). Investment property in the financial statements of capital groups listed on the Warsaw stock exchange. *European Journal of Economic and Business Studies*, *4*(1), 230–237. Doi: https://doi.org/10.26417/ejes.v4i1.p229-236

Procházka, D. (2011). The role of fair value measurement in the recent financial crunch. *Prague Economic Papers*, *39*(1), 71–88.

Radić, S. (2012). Računovodstvo fer vrednosti kao faktor unapređenja efikasnosti finansijskog tržišta. *Računovodstvo*, *56*(9-10), 5-18.

Singh, J.P., & Doliya, P. (2015). On the audit of fair value measurements. *Ekonomski horizonti*, *17*(1), 61-71. Doi: https://doi.org/10.5937/ekonhor1501061s

Stojanović, R. (2016). Koncept fer vrednosti versus nabavne vrednosti. *Računovodstvo*, *60*(2), 66-87.

Széles, Zs., Dečman, N., & Rep, A. (2019). Opportunities and Challenges in the Practical Application of Fair Value Model in the Field of SMEs Financial Reporting. In Resperger, R. & Czeglédy, T. (Eds.), *Proceedings of the International Scientific Conference Modern economy, smart development* (pp. 475-489). Sopron: University of Sopron Press.

Taplin, R., Yuan, W., & Brown, A. (2014). The use of fair value and historical cost accounting for investment properties in China. *Australasian Accounting Business and Finance Journal*, *8*(1), 101–113. Doi: http://dx.doi.org/10.14453/aabfj.v8i1.6

The Institute of Chartered Accountants in England and Wales (2007). *EU Implementation of IFRS and the Fair Value Directive: A report for the European Commission*. London: ICAEW Financial Reporting Faculty.

Tušek, B., Decman, N., & Rep, A. (2018). Fair value measurement of long-term tangible assets: existing experience and possible challenges for Croatian small manufacturing enterprises. In K.S. Soliman (Ed.), *32nd International Business Information Management Association Conference* (pp. 1461-1473), 15-16 November 2018, Seville, Spain.

Vasilev, D., Cvetković, D., & Grgur, A. (2019). Detection of fraudulent actions in the financial statements with particular emphasis on hotel companies. *Hotel and Tourism Management*, *7*(1), 115-125. Doi: https://doi.org/10.5937/menhottur1901115V

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Economic security of Bosnia and Herzegovina as part of the national security system

Економска сигурност Босне и Херцеговине као део система националне сигурности

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Abstract: Due to the specifics of the political and economic system in Bosnia and Herzegovina (BiH), in the recent history of the country it has not been possible to approach the problem and challenges of economic security comprehensively and seriously. The given circumstances reinforce the need for research and analysis of economic security in BiH in order to show the real situation. This paper analyses economic security as a part of national security, with the help of relevant indicators, and then the connection of economic security with the economic development of BiH. Methods of analysis, synthesis, compilation, correlation and linear regression were applied for research purposes. The aim of the research is an empirical analysis of economic security indicators in terms of determining the degree of interconnection of key variables of economic security (public debt, availability of financial resources, technological progress, investment in fixed assets, unemployment, military investment, foreign exchange reserves, budget deficit, GDP growth rate, etc.) for the period from 2008 to 2018. The results of the research clearly reveal that economic and national security are mutually interrelated, and that economic security is a precondition for national security, which confirms the main hypothesis of this paper.

Key words: economic system, economic security, national security, GDP, indebtedness, investments, unemployment.
JEL classification: E6

Сажетак: Због специфичности политичког и економског система у Босни и Херцеговини, у новијој историји земље није било могуће свеобухватно и озбиљно приступити проблему и изазовима економске безбедности. Дате околности појачавају потребу за истраживањем и анализирањем економске безбедности у БиХ како би се приказало реално стање. У овом раду анализирана је економска безбедност као дио националне безбедности, уз помоћ релевантних индикатора, а затим веза економске безбедности са економским развојем БиХ. За потребе истраживања примењене су методе анализе, синтезе, компилације, корелације и линеарне регресије. Циљ истраживања јесте емпиријска анализа показатеља економске безбедности у погледу утврђивања степена међусобне повезаности кључних варијабли економске безбедности (јавни дуг, доступност финансијских ресурса, технолошки прогрес, улагања у фиксну активу, незапосленост, улагања у војску, девизне резерве, прилив СДИ, стопа раста БДП) за период од 2008. до 2018. године. Резултати истраживања нам јасно говоре да се економска и национална безбедност међусобно преплићу, те да је економска безбедност предуслов националне безбедности што потврђује главну хипотезу овог рада.

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Кључне речи: економски систем, економска безбедност, БДП, задуженост, инвестиције, незапосленост.
ЈЕЛ класификација: E6

Introduction

The issue of economic security has always been a relevant topic, especially in modern times. It is becoming even more important in Bosnia and Herzegovina (BiH), taking into account its specific, and complex state organization. In modern times, as BiH trying to achieve greater compliance with European and world standards, the issue of economic security is becoming more "popular" and more prominent. Due to the specifics of the political and economic system in Bosnia and Herzegovina, in the recent history of the country it has not been possible to comprehensively and seriously approach the problem and challenges of economic security. The lack of unified databases, poor vertical and horizontal coordination, as well as poor cooperation of institutions at different administrative levels, posed an obstacle to a comprehensive understanding of the problem of economic security. Due to such circumstances, the need for research and analysis of economic security in BiH has been strengthened, with the aim of establishing and presenting the reality in BiH when it comes to a given issue. The results of such research is to show the level of economic security in BiH.

The research problem is focused on the impact of selected indicators of economic security, as well as the impact of indicators of economic development of the country on economic security. The subject of this paper is to analyse the economic security of BiH within the national security system, as well as the examination of economic security indicators. In this context, they will be compared with each other in order to reach a conclusion about their mutual relationship, as well as the overall impact on economic security. Starting from the issue of research of variables that are the focus of the paper, the following hypotheses have been set out that will be tested in the research process: *H1*- There is a statistically significant relationship between indicators of economic security; *H2* - Economic security indicators have a positive effect on GDP; *H3* - Economic security is a precondition for national security.

The paper is organized as follows: the first part discusses the existing literature and provides an adequate theoretical basis for further research, the second part refers to general facts about existing indicators and the choice of variables, the third part is dedicated to define the methodology used in research, and the fourth part presents empirical research results and discussion, while the fifth part concludes the paper.

1. Literature review

The term "security" has changed its meaning throughout history, and consequently there are numerous definitions of this term today. In the initial stages of considering this term, it used to describe the safety of persons and goods. In the strategic sense, the term “State Security”, or, more often, “National Security” mainly referred to the defines of the territory from physical threats, classic way of endangering it by enemy diplomacy and conventional armed forces. With the advent of the Industrial Revolution, with the accelerated

development of science and technology, and later with the greater use of the Internet in modern times, there are growing challenges in terms of endangering the security of individuals, businesses, governments and states as a whole. Thus, the concept of security becomes more complex and takes on new forms, definitions and challenges (Antić, 2021).

Đukić (2017) points out that today the term "security" has come into use in numerous social areas such as politics, health, economics and finance, informatics, psychology, architecture, etc. Also, science is trying to find cause-and-effect relationships and answers to the new situation. Based on a comparative study, which covered 124 countries in a period between 1980 and 1995, the authors of the study concludes that civilian conflicts are always linked to five factors: stagnation and decrease of real GDP, a high share for military budget within national income, a tradition of conflict, a high income inequality and slow average growth in food production (Allan & Colleta, 2001).

Previous research resulted in a comprehensive understanding of national security through the prism of economic indicators such as public debt, GDP growth rate, capital investment, productivity, technology and institutions (Ignatov, 2019). Liapis et al. (2013) point out that the recent economic and financial crisis has shown that highly indebted EU countries are economically vulnerable as a result of their financial and credit position. Panizza and Presbitero (2013) conclude that if a country is excessively indebted and its economy is to be significantly vulnerable to external shocks.

For an economy to be developed and a state to be economically stable, it is necessary for a company to have access to the capital. McKinnon (2010) points out that the availability of financial resources determines the capacity of the economy to produce wealth. If the state has the power to produce wealth, then it has the ability to strengthen its economic power. Strengthening the economic growth and economic security of states is also achieved through investment in fixed assets. Piketty (2015) claims that investing in a fixed asset is a determinant of the economy's capacity to develop and strengthen infrastructure, industry, and so on. Such activities certainly strengthen wealth and economic strength.

Zelenika and Pearce (2011) recognize the importance of technology in strengthening economic security and the economy in general. These authors believe that economies that manage to keep pace with socio-economic development have the power to improve their economic position and thus the economic security.

An important element of economic security is the unemployment rate. Research mainly begins with the fact that a high unemployment rate implies a higher poverty rate, which increases the risks to economic and national security. Azalahu et al. (2013) show that unemployment and poverty pose a serious threat to national security. These findings are the result of research in Nigeria, and can be applied to other less developed economies. The authors conclude that unemployment leads to poverty, while both poverty and unemployment have implications for national security.

Foreign direct investment (FDI) is an important basis for the country's economic development and is also an element of economic and national security. FDIs are strongly linked to globalization flows, because it is clear that these processes have enabled the free flow of capital, goods and services. Taking into account that FDI represents great sums of

money, which in less developed countries occupy a high share of GDP, it is clear that FDI inflows and outflows have strong effects on the economic security of these countries (Graham and Marchick, 2006).

An important aspect of national security is also maintaining the stability of the domestic currency. Considering that Bosnia and Herzegovina implements the policy of the currency board, it is of great importance to maintain an adequate level of foreign exchange reserves. An adequate level of foreign exchange reserves provides security to the economy, i.e. protects it from economic shocks (Šoja & Galijašević, 2017). Foreign exchange reserves need to cover three months of imports, 100% of the country's short-term external debt, and 20% of the broadest monetary aggregate (IMF, 2020). If an adequate level of foreign exchange reserves is maintained, the economy seems to be more resilient to external economic shocks.

Taking into account the review of research by other authors on economic security, it is clear that the impact of globalization is noticeable in all segments of security and thus in the segment of economic security. Bosnia and Herzegovina is no exception, so it faces modern challenges of economic security.

2. Indicators and selection of variables

Along with the recognition the significance of economic security as a component of modern economy and the security of the state as well, certain indicators of it have been defined so far. To establish mechanisms for establishing and maintaining economic security, it is necessary to identify indicators that indicate the state of economic security of the country. Indicators serve as a simple tool for monitoring and are subjected to changes in accordance with global circumstances. In the era of modern globalization, the number of indicators of economic security has been increased compared to earlier historical periods. At the same time, the range of possibilities for endangering economic security has been increased. However, the advent of modern information technologies has facilitated the constant monitoring of indicators, thus enabling the timely detection of shortcomings and their timely correction. Some of the indicators of economic development are also indicators of economic security, which can be direct and indirect, and some of them also descriptive. The most important are: territory, population, GDP, allocations for the armed forces, foreign direct investment, unemployment and poverty, gold and money reserves, public debt, budget deficit, technological progress – technology and innovative activity, gas and other energy stocks, natural resources, ecology and structure of the banking system and foreign exchange reserves. Most economic security indicators coincide with economic development indicators. Due to the non-existence and unavailability of data, and due to the volume as well, all the above indicators will not be the subject of consideration in this paper. (Antić, 2021).

In addition to some favourable indicators in BiH, including the growth of foreign exchange reserves and gold reserves, GDP growth, we also encounter indicators that represent vulnerabilities, such as demography and age structure of the population. Bearing in mind that unemployment contributes to poverty, it can be said that BiH, even with the

decline in the percentage of unemployed, is in an unenviable situation in respect to this issue. It could be defined as a very vulnerable and sensitive point from the aspect of the economic security (Antić, 2021). These are some of the indicators clearly indicate that BiH's economic security could be seriously compromised in a longer period of time.

Specific indicators of economic security are the National Security Index (NSI), which is the average of five other indices: the Human Development Index (HDI), the Research and Development Index, the Gross Domestic Product Performance Index, the Defence Expenditure Index and the Population Index. In addition to these indices, Asghari (2016) also cites the KOF Index, which consists of three dimensions: economic globalization, political globalization, and social globalization. However, these indicators will not be analysed because they are not applicable to our conditions at this time, and due to lack of data as well. The impact of certain indicators on economic security is direct and obvious, which could be recognized in the example of allocations for the armed forces, while some indicators are indirectly correlated with economic security.

3. Methodology

The empirical part of the paper is focused on examining the relationship between economic security indicators, as well as between them and GDP, i.e. economic growth as measured by the growth rate of GDP. In the empirical part of the paper, the focus is on examining the relationship between the variables that measure economic security for the period from 2008 to 2018.

In the first step, the data were collected, summarized, presented in tables and graphical descriptive analysis, and then a correlation and regression analysis were performed to test the set hypotheses. Descriptive statistics included the presentation of data through mean, minimum and maximum and standard deviation. Correlation analysis examines the state of mutual or reciprocal correlation between variables. It also represents a pattern of variation of variables depending on the way the variables are related, which is significantly different in relation to their isolated properties or the expected way of reacting.

The degree of correlation is expressed by the correlation coefficient which shows the degree of quantitative agreement, and is denoted by *r*.

4. Research results and discussion

The data used for the analysis are taken from the World Bank and the BiH Agency for Statistics. The period covered in the analysis is from 2008 to 2018. The following variables were analysed: public debt situation, financial resources, technology, fixed assets, unemployment rate, investments in the army, foreign exchange reserves, GDP growth rate, and net inflow of foreign investments. Data analysis and processing was performed in the statistical software package SPSS. Descriptive statistics for the analysed variables are shown in Table 1.

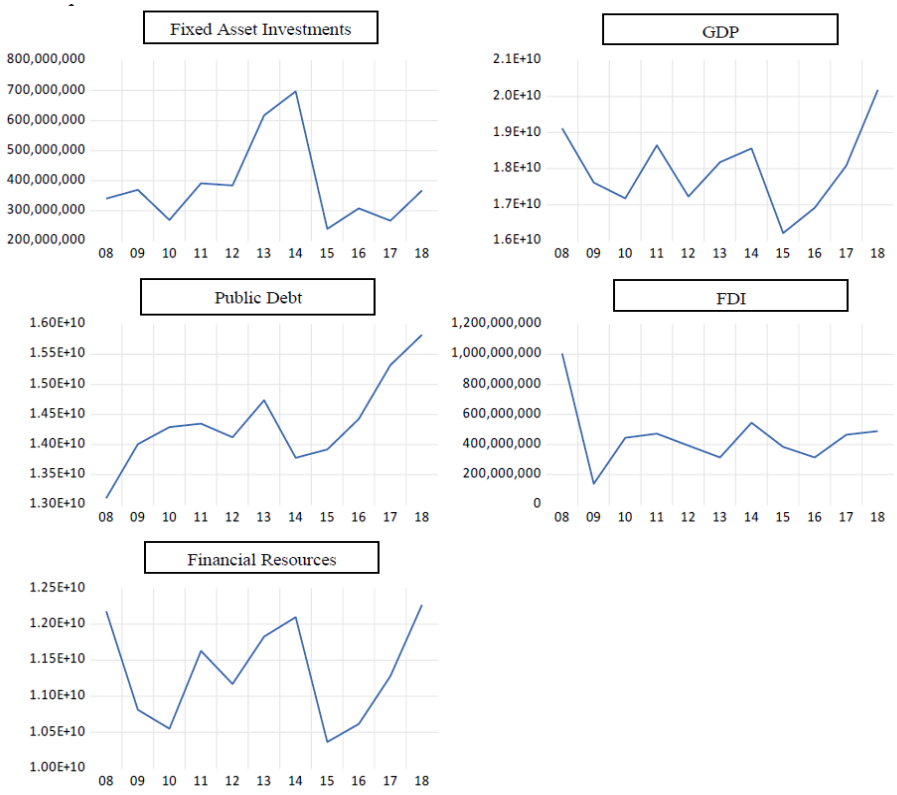
Table 1. Descriptive statistics of analysed variables

Description	*Public debt (in mil. $)*	*Financial resources (in mil. $)*	*Techn. (in mil. $)*	*Fixed assets (in mil. $)*	*Unemployment rate (in %)*	*Inve. in the army (in mil. $)*	*Foreign exchange reserves (in mil. $)*	*GDP growth rate (in %)*	*Net inflow of foreign investments (in mil. $)*
Average	14,351.62	11,345.09	123.11	386.33	25,22	200,12	5,014,31	1,72	450,75
St. error	223.53	210.28	19.57	43.54	0,99	8,87	256,87	0,69	64,76
Standard deviation	741.37	697.42	64.92	144.40	3,28	29,42	851,96	2,29	214,79
Minimum	13,108.61	10,365.69	74.44	239.32	18,40	157,97	4,247,54	-3,00	138,51
Maximum	15,824.21	12,266,10	261.38	697,04	28,01	242,47	6,808,43	5,43	1.004,85
Series length	11	11	11	11	11	11	11	11	11

Source: the authors' calculation

In the period from 2008 to 2018, the public debt of BiH amounted to around 14 billion US dollars. The minimum value of the debt was around 13.1 billion US dollars, and the maximum value was around 15.8 billion US dollars. Financial resources are observed through the value of lending. In the observed period, the value of the loan was around 11.3 billion US dollars, with the minimum value being around 10.3 billion dollars and the maximum value around 12.2 billion dollars. Investments in technology during the observed period averaged 123 million BAM, and ranged from 74.4 million to 261.3 million, which indicates that these investments were not uniform but variable. Investments in fixed assets averaged $ 356 million, which is a modest amount of funds for these purposes. It is noticed that the differences between the minimum and maximum are quite high. The inflow of foreign investments is also quite modest and has been declining in recent years. During the observed period, the inflow of foreign direct investment averaged $ 450 million, with a maximum value of $ 1 billion and a minimum of $ 138 million (Figure 1).

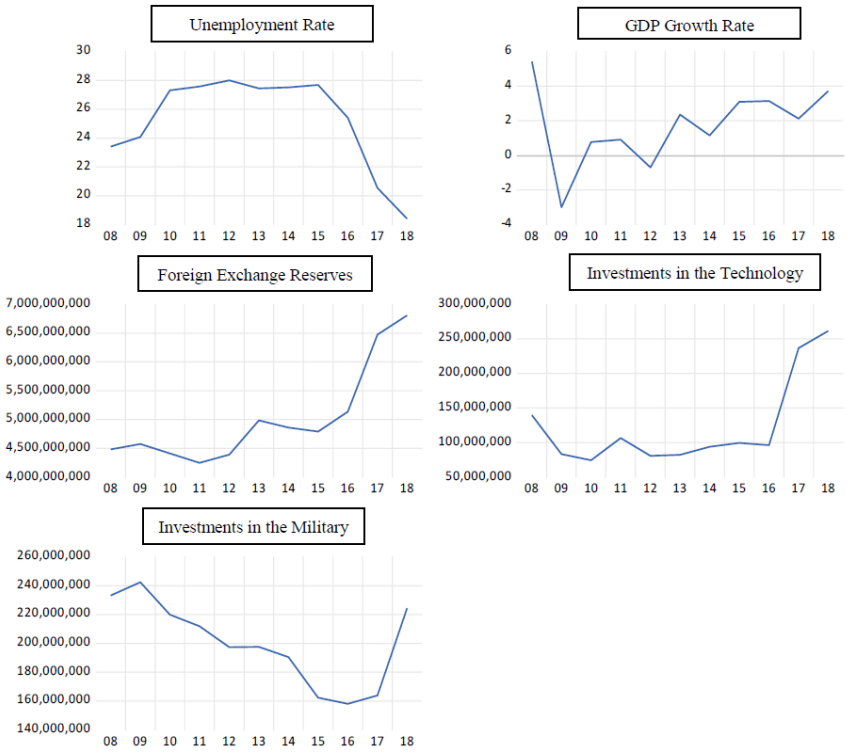
Figure 1. Graphical representation of the movement of the analysed variables in the period 2008-2018



Source: the authors' calculation

The unemployment rate is one of the biggest problems in the BiH economy. On average, the unemployment rate during the observed period was 25%, with a minimum rate of 18.4% and a maximum of 28.01%. It is important to emphasize that in this case the unemployment rate is shown according to the World Bank calculation. Investments in the military during the observed period were quite modest and averaged $ 200 million. The minimum value of investments in the army amounted to around 157 million, while the maximum value was around 242 million. It has been noticed that there were no large oscillations in investments, but still were quite modest. Foreign exchange reserves have tended to grow in recent years. During the observed period, the average value of foreign exchange reserves was about 5 billion US dollars, while the minimum value was 4.2 billion US dollars, and the maximum value was 6.8 billion US dollars (Figure 2). The GDP growth rate during the observed period was 1.72%. The negative rate recorded is 3% and the maximum positive is 5.43%.

Figure 2. Graphical representation of the movement of the variables analysed



Source: the authors' calculation

Such rates are quite low, and insufficient for transition countries to encourage stronger development. World Bank research shows that growth should be at least 6% to ensure stable economic development (Steinbach, 2019).

In order to test the hypotheses, and taking into account the analysed data placed in relation to each other, a correlation and regression analysis were performed. Correlation analysis examined the relationship between the observed variables, i.e. it was assessed whether there is a relationship between the observed variables and how strong it is. Regression was used to analyse, i.e. examine the dependence between the variables that are related to each other. Correlation analysis, which examined the existence of correlations between variables are shown in Table 2.

Table 2. Correlation analysis

		Public debt	*Financial resources*	*Techn.*	*Fixed assets*	*Unempl. rate*	*Invest. in the army*	*Foreign exch. reserves*	*Net inflow of foreign invest.*
Public debt	Pearson correla.	1	-0.466	.684*	-0.097	-0.586	-0.173	.829**	-0.368
	Sig. (2-tailed)		0.148	0.02	0.776	0.058	0.61	0.002	0.266
	T	11	11	11	11	11	11	11	11
Financial resources	Pearson correla.	-0.466	1	-0.449	0.584	0.601	-0.374	-0.368	0.175
	Sig. (2-tailed)	0.148		0.166	0.059	0.051	0.258	0.266	0.606
	T	11	11	11	11	11	11	11	11
Technology	Pearson correla.	.684*	-0.449	1	-0.252	-.913**	-0.028	.902**	0.28
	Sig. (2-tailed)	0.02	0.166		0.455	0	0.936	0	0.404
	T	11	11	11	11	11	11	11	11
Fixed assets	Pearson correla.	-0.097	0.584	-0.252	1	0.297	0.109	-0.114	-0.011
	Sig. (2-tailed)	0.776	0.059	0.455		0.375	0.749	0.739	0.975
	T	11	11	11	11	11	11	11	11
Unemployment rate	Pearson correla.	-0.586	0.601	-.913**	0.297	1	-0.179	-.838**	-0.196
	Sig. (2-tailed)	0.058	0.051	0	0.375		0.598	0.001	0.563
	T	11	11	11	11	11	11	11	11
Investment in the army	Pearson correla.	-0.173	-0.374	-0.028	0.109	-0.179	1	-0.24	0.216
	Sig. (2-tailed)	0.61	0.258	0.936	0.749	0.598		0.478	0.523
	T	11	11	11	11	11	11	11	11
Foreign exchange reserves	Pearson Correla.	.829**	-0.368	.902**	-0.114	-.838**	-0.24	1	-0.032
	Sig. (2-tailed)	0.002	0.266	0	0.739	0.001	0.478		0.926
	T	11	11	11	11	11	11	11	11
Net inflow of foreign investments	Pearson correla.	-0.368	0.175	0.28	-0.011	-0.196	0.216	-0.032	1
	Sig. (2-tailed)	0.266	0.606	0.404	0.975	0.563	0.523	0.926	
	T	11	11	11	11	11	11	11	11
* Correlation is significant at the 0.05 level (2-tailed)									
** Correlation is significant at the 0.01 level (2-tailed)									

Source: the authors' calculation

The obtained results show that there is a statistically significant, positive and strong relationship between public debt and technology (0.684), as well as between public debt and foreign exchange reserves (0.829). Other economic security variables are not

significantly related to public debt. If financial resources are observed, it is noticed that they are in a certain medium-strong connection with other elements of economic security. There is a statistically significant negative relationship (-0.466) with public debt, then with technology (negative relationship -0.449), there is a significant positive relationship with fixed asset investments (0.584), a positive relationship with the unemployment rate (0.601), while with other variables no statistically significant association was found.

Investments in technology are statistically significantly related to public debt (correlation 0.684), with trends in financial resources there is a negative relationship (-0.449), there is a very high negative correlation with the unemployment rate (-0.913), a positive and strong relationship with foreign exchange reserves (0.902), and a significant relationship with the net inflow of foreign investment (correlation 0.404).

The variable fixed assets, which is also one of the elements of economic stability, stands in a statistically significant positive relationship with financial resources (correlation 0.584), while it is not in a statistically significant relationship with other variables. The unemployment rate is in a statistically significant negative relationship with public debt (-0.586), followed by a positive relationship with financial resources (0.601), a strong negative relationship with technology (-0.913), and a negative relationship with foreign exchange reserves (-0.838).

Investments in the military are not statistically significant with any variable. This means that the observed variables are not related to investments in the military, but these investments are related to some other variables. Foreign exchange reserves are strongly positively related to public debt (correlation 0.829), technology investment (correlation 0.902), significantly negatively related to the unemployment rate (correlation -0.838), while there is no significant relationship with other variables. The inflow of foreign investments is not statistically significant in relation to any of the observed variables that measure economic security and the country.

After examining the correlation between the variables analysed, i.e. between the variables that measure economic security, a regression analysis was performed in which the dependent variable is the GDP growth rate, while the independent variables are: public debt, financial resources, technology, fixed assets, rate unemployment, military investment, foreign exchange reserves and net inflow of foreign investment. In order to examine the correlation between the variables, regression models were developed in which the dependent variable is the GDP growth rate, as well as the nominal GDP during the observed period. When developing the model, all variables were taken into account, and the results of the regression model are shown in the tables below.

Table 3. Summarized multiple regression model

Model summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.896[a]	.802	.011	2.27339	3.391
a. Predictors: (Constant), Net inflow of foreign investments, Investments in the military, Fixed assets, Unemployment rate, Financial resources, Public debt, Technology, Foreign exchange reserves					
b. Dependent Variable: GDP growth rate					

Source: the author's calculation

The results obtained show that the coefficient of determination is 80.20%, which indicates that the observed predictors, i.e. indicators of economic security explain 80.2% of GDP growth. The Durbin-Watson index is 3,391, indicating that there is an autocorrelation between the variables included in the model. The analysis of the variance of the regression model is shown in Table 4.

Table 4. Analysis of variance

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	41.902	8	5.238	1.013	.586[b]
	Residual	10.337	2	5.168		
	Total	52.239	10			
a. Dependent Variable: GDP growth rate						
b. Predictors: (Constant), Net inflow of foreign investments, Investments in the military, Fixed assets, Unemployment rate, Financial resources, Public debt, Technology, Foreign exchange reserves						

Source: the authors' calculation

With the ANOVA test, we measure how significant the regression model is, and this is shown by the significance data, which in this case is 0.586, and is higher than the limit of 0.05 (because the regression was performed with a 95% confidence interval). More precisely Sig. (0.586)> 0.05, and it is concluded that the regression model does not correctly predict the GDP growth rate. The coefficients of the regression model are shown in Table 5.

Table 5. Regression model coefficient

Coefficients[a]								
Model		Unstandardized coefficients		Standar. coeffic.	t	Sig.	Collinearity statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	50.669	66.302		.764	.525		
	Public debt	.124	.923	.284	.134	.905	.022	45.348

	Financial resources	-.622	.811	-.677	-.767	.523	.127	7.856
	Technology	-7.460	8.714	-1.055	-.856	.482	.065	15.353
	Fixed assets	.296	3.022	.098	.098	.931	.099	10.148
	Unemployment rate	-.773	1.529	-1.108	-.506	.663	.021	48.515
	Investments in the military	-2.117	13.928	-.133	-.152	.893	.129	7.746
	Foreign exchange reserves	-.033	1.334	-.059	-.025	.983	.017	58.264
	Net inflow of foreign investments	2.450	2.106	1.167	1.163	.365	.098	10.170
a. Dependent Variable: GDP growth rate								

Source: the author's calculation

The results show that there is a high multicollinearity among the observed variables. This conclusion leads to the value of VIF data. It is desirable that this data be up to 10 in order to consider that there is no multicollinearity, which was not noted in this case. In order to investigate the appropriate regression model, certain factors were excluded from the model, namely: public debt, unemployment rate and foreign exchange reserves. After that, the regression model was restarted, and the results are given in the following tables. The regression model with the mentioned variables are shown in Table 6.

Table 6. Regression model summary

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.843[a]	.710	.421	1.73974	2.860
a. Predictors: (Constant), Technology, Net inflow of foreign investments, Investments in the military, Fixed assets, Financial resources					
b. Dependent Variable: GDP growth rate					

Source: the authors' calculation

The coefficient of determination is 71%, which indicates that the GDP growth rate is explained by 71% of variations that come from changes in technology, net inflow of foreign investments, investments in the army, fixed assets, and financial resources. The Durbin-Watson index is 2.86, and it is concluded that there is a slight autocorrelation. In the next step, ANOVA analysis was performed, which is shown in table 7.

Table 7. ANOVA analysis

Model		Sum ANOVA[a] of Squares	df	Mean Square	F	Sig.
1	Regression	37.105	5	7.421	2.452	.174[b]
	Residual	15.134	5	3.027		
	Total	52.239	10			
a. Dependent Variable: GDP growth rate						
b. Predictors: (Constant), Technology, Net inflow of foreign investments, Investments in the military, Fixed assets, Financial resources						

Source: the authors' calculation

The regression model in this case is not statistically significant, as indicated by the significance data, which in this case is greater than 0.05. More precisely Sig. (0.174)> 0.05, and it is concluded that the regression model does not correctly predict the GDP growth rate. The next step is the analysis of the regression coefficients, which is shown in Table 8.

Table 8. Regression coefficient

Coefficients[a]								
Model		Unstandardized coefficients		Standar. Coeffic.	T	Sig.	Collinearity statistics	
		B	Std. error	Beta			Toler.	VIF
1	(Constant)	22.633	25.974		.871	.423		
	Financial resources	-.384	.575	-.417	-.667	.534	.148	6.746
	Fixed assets	-.127	.837	-.042	-.152	.885	.752	1.329
	Investments in the military	-1.548	8.752	-.097	-.177	.867	.191	5.223
	Net inflow of foreign investments	1.688	.755	.804	2.235	.076	.448	2.232
	Technology	.283	2.237	.040	.127	.904	.579	1.728
a. Dependent Variable: GDP growth rate								

Source: the authors' calculation

The results show that there is no multicollinearity among the data analysed, given that the VIF data for each data is less than 10. The obtained results show that investments in technology and inflows of foreign direct investment have a positive impact on GDP growth, while other variables have a negative impact on the rate GDP growth. However, none of the mentioned factors, i.e. the factors included in the model, are statistically significant since the significance indicator Sig. for each indicator is higher than the limit value of 0.05. The regression model, according to the model presented for this purpose, has the following form:

$$\text{GDP growth rate} = 22,63 - 0,384X1 - 0,127X2 - 1,1548X3 + 1,688X4 + 0,283X5 + \varepsilon$$

In order to make this analysis more detailed and complete, a regression analysis was performed in which the dependent variable is GDP, instead of the previous dependent variable - GDP growth rate. Regression analysis was performed, and the results obtained are presented in the following tables.

Table 9. Regression model

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.954[a]	.910	.850	433.86281	2.890
a. Predictors: (Constant), Net inflow of foreign investments, Fixed assets, Investments in the military, Public debt					
b. Dependent Variable: GDP					

Source: the authors' calculation

The regression model, in summary, shows that foreign direct investment, investment in fixed assets, investment in the military, and public debt explain as much as 91% of variations in GDP. The Durbin-Watson indicator is 2,890, indicating that there is no significant autocorrelation among the data. Table 10 shows the results of the ANOVA test.

Table 10. ANOVA analysis

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11445237.948	4	2861309.487	15.201	.003[b]
	Residual	1129421.635	6	188236.939		
	Total	12574659.583	10			
a. Dependent Variable: GDP						
b. Predictors: (Constant), Net inflow of foreign investments, Fixed assets, Investments in the military, Public debt						

Source: the author's calculation

The regression model is reliable and statistically significant, as indicated by the Sig value. (0.003) <0.05, and it is concluded that the regression model predicts GDP in a correct way. The parameters of the regression model are given in the table below.

Table 11. Regression model parameters

Coefficients[a]								
Model		Unstandardized coefficients		Stand. coeffic.	t	Sig.	Collinearity statistics	
		B	Std. error	Beta			Toler.	VIF
1	(Constant)	-2913.640	3271.484		-.891	.407		
	Public debt	1.029	.201	.680	5.118	.002	.847	1.180
	Fixed assets	.029	.010	.374	3.021	.023	.977	1.023
	Investments in the military	17.456	4.829	.458	3.615	.011	.933	1.072
	Net inflow of foreign invest.	3.377	.698	.647	4.837	.003	.837	1.195
a. Dependent Variable: GDP								

Source: the author's calculation

If the results of the regression coefficients are observed, it can be noticed that there is no multicollinearity between the data, which makes the regression model more reliable. If the statistical significance of the regression parameters is observed, it can be noticed that all the parameters of the model are statistically significant, because the data is Sig. for each parameter less than the limit of 0.05. The regression model in this case is:

$$\text{GDP} = -2.913,64 + 1,029X1 + 0,029X2 + 17,456X3 + 3,377X4 + \varepsilon$$

The regression model indicates that public debt, investment in fixed assets, investment in the military as well as inflows of foreign investment contribute positively to BiH GDP. The regression model is reliable, as the elements of the regression model, so this model can be used for further analysis and prediction. Based on the presented research results, certain arguments are identified which examine our hypotheses. With regard to the first hypothesis, which claims that between indicators of economic security a statistically significant correlation is determined, results still indicate that between some indicators, a strong and statistically significant correlation does exist, while there is no such correlation between some others, which clearly indicates to the partial fulfilment of the set hypothesis.

The first hypothesis was tested using the correlation method. The second hypothesis was tested using regression analysis, which unequivocally showed that economic security indicators have a positive effect on GDP.

Conclusion

If the state wants to preserve its security, i.e. sovereignty, integrity, territorial integrity and independence, it must be able to ensure a strong army as an instrument to deter open aggression, as well as strong and up-to-date institutions dealing with the economic security of the country. In order to have a strong army, the state must be economically strong to be able to finance the army, which is achieved by strong economic institutions that take care of economic security. Therefore, if the state is economically strong, it will be easier to deal

with the challenges of economic security. Institutions responsible for economic security issues must be aware of any situation and potential threats in every moment. In a case that economic security is endangered, responsible instructions are obliged to have prepared scenarios. Those areas are interrelated to each other and represents cause-and-effect relationships.

This article analysed the state of public debt, financial resources, technology, fixed assets, unemployment rate, investment in the army, foreign exchange reserves, and the net inflow of foreign investment in BiH. The observed period of analysis was 2008-2018. Based on the results obtained, it was established that the set hypotheses were proven. The first hypothesis claims that a statistically significant correlation between economic security indicators is determined. The results still indicate that a strong and statistically significant correlation between some indicators does exist, while there is no such correlation between some others indicators.

Thus, public debt is in a very strong and statistically significant relationship with investment in technology, and with trends regarding foreign exchange reserves. Financial resources are significantly related to investing in fixed assets, the state of the unemployment rate as well as foreign exchange reserves. There is no significant statistical relationship of military investments to other elements, also to net inflows of foreign investment. According to the obtained results it could be concluded that there is indeed a strong connection between certain factors of economic security, which is in favour of proving the set hypothesis. However, on the other hand, neither a strong nor a statistically significant relationship was found between certain factors. The consequence of that is reflected in the fact that the available funds are unevenly invested in BiH, which results in a weaker development of certain sectors, which certainly represent elements of economic security as well.

The second hypothesis claims that economic security indicators have a positive effect on GDP, which has been proven through regression analysis as well. The results show that public debt, fixed assets, military investment and foreign investments have statistically significant and positive impact on GDP. Over 70% of changes in GDP in BiH could be explained by these indicators. Throughout history, the economy has been a prerequisite for secure survival. In order to provide good and quality living conditions and essential needs for the family, people used to work. In addition to securing the country's borders and sovereignty, states had to take into account the resources they possessed (mostly natural in early history) and find a way to procure what they did not naturally possess (mineral resources and food). Nowadays, the basic idea is the same, the correct allocation of resources, with respect to the fact that these processes are further complicated by technological progress. Most macroeconomic indicators and indicators of economic development are also indicators of economic security. As is evident in the proof of the second hypothesis, economic security indicators have a positive effect on GDP, which is one of the main "indicators" of a country's strength. In what has been presented so far, it is apparent that economic and national security are intertwined, and that economic security is a precondition for national security, which confirms the third hypothesis expressed in this paper.

Population issues might cause a big concern we may face in the future. Developed countries are "aging", while some poor countries such as The DRC has a population with an average age of 18 years. According to the above fact, it can be concluded that the former could have a deficit of human resources, and the latter could have high unemployment and population that is to seek employment in the developed countries. The states, which manage to overcome this problem in the best way, will be economically safer than others. In the period ahead, the economic structure is increasingly turning to the tertiary, quaternary and quintal sectors. Services, tourism, traffic, information technology and social protection are branches that will come to the fore in modern society. None of the above would be possible without scientific progress and innovation, so countries that invest enough in science, combined with a young population, could become modern leaders in economic and civilizational terms.

This paper does not consider variables such as VAT, inflation and others, which could have an important role in the overall economic system, and thus economic security. Therefore, the analysis of variables not covered in this paper is a recommendation for future research in this area.

The economic crisis caused by the COVID-19 pandemic has led to a slowdown in world economies and a decline in the social product. Consequently, in the forthcoming period, states are more likely to commit individually to their economic security than in the context of collective security. Thus, those countries that are economically stronger and more stable could be safer from the aspect of economic security. According to the current trends on the international scene it could be concluded that countries that want to maintain their economic security at the required level, for survival and development will have to provide access to capital, keep up with and even increase the level of technological development, attract foreign investment and provide the necessary political stability.

References

Azalahu A. F., Akwara, N. F., Enwuchola, J., Adekunle, M., & Udaw, J. E. (2013). Unemployment and poverty: implications for national security and good governance in Nigeria. *International Journal of Public Administration and Management Research* (IJPAMR), *2*(1), 1-11.

Antić, V. (2021). *Temeljni izvori rizika i prijetnji po ekonomski razvoj i ekonomsku bezbjednost Bosne i Hercegovine*, Jahorina Business Forum - X Scientific Conference with International Participation, Proceedings JBF - ISSN 2303-8969, pp. 337-353.

Allan, G. & Colleta, N. J. (2001). *Privatizing Peace: From Conflict to Security*, Leiden: Brill - Nijhoff.

Asghari, M. (2016). National security and economic growth, *Iran Economic Review*, *21*(4), 905-924.

Đukić, S. (2017). *Osnove i sistem bezbednosti u strategiji nacionalne bezbednosti*, Beograd: Vojno delo.

Graham, E. M. & Marchick D. M. (2006). *US National Security and Foreign Direct Investment*. Washington: Peterson Institute for International Economics.

Ignatov, A. (2019). Analysis of the dynamics of the European economic security in the conditions of a changing socio-economic environment, *New Medit 18*(2), 15-38. https://doi.org/10.30682/nm1902b.

IMF. (2020). Indicators, available at: https://data.worldbank.org/indicator (accessed May 5, 2020).

Liapis, K., Rovolis, A., Galanos, C. & Thalassinos, E. (2013). The clusters of economic similarities between EU countries: view under recent financial and debt crisis. *European Research Studies*, *16*(1) 41-66. Doi: https://doi.org/10.35808/ersj/380

McKinnon, R. (2010). *Finance and Development.* Washington: International Monetary Fund.

Panizza, U., & Presbitero, A.F. (2013), Public debt and economic growth in advanced economies: a survey. *Swiss Journal of Economics and Statistics*, 149, 175–204. https://doi.org/10.1007/BF03399388.

Piketty, T. (2015). About capital in the twenty-first century. *American Economic Review*, *105*(5), 48-53.

Steinbach, R. (2019). *Growth in Low-Income Countries Evolution, Prospects and Policies, Equitable Growth, Finance and Institutions, Global Practice*, Policy Research Working Papers, Washington: World Bank.

Šoja, T. & Galijašević, Z. (2017). Foreign Reserves as a shock protection – the example of Bosnia and Herzegovina, *Acta Economica*, *15*(27), 93-115, Doi: https://doi.org/10.7251/ACE1727093S

Zelenika, I. & Pearce M. Joshua, P. M. (2011). Barriers to appropriate technology growth in sustainable development. *European Journal of Sustainable Development*, *4*(*6*), 12-22.

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Economic challenges of entrepreneurs in the Republic of Serbia operating in the most prospective economic activities

Економски изазови предузетника у Републици Србији који послују у најперспективнијим привредним делатностима

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Abstract: High unemployment rate, low level of economic activity and low living standards are some of the most significant problems that the Republic of Serbia has been facing in the last few years. The development of small and medium enterprises and entrepreneurs as great potential to solve these problems to some extent is still not sufficiently exploited. Keeping in mind the importance of the development of this economy segment, this paper analyses the business economy of entrepreneurs by economic activities in 2018 in the Republic of Serbia to determine the economic activities that have the greatest prospects for entrepreneurship development in the future. The ratio analysis of operations was used as a starting point for comparative analysis. It was conducted using the data obtained from the *Annual Bulletin of Financial Statements* published by the Business Registers Agency for ten economic activities where entrepreneurs reordered the highest profitability in 2018. Using the entropy method and PROMETHEE method, the ranking of entrepreneurs according to economic activities was performed. The obtained results indicated that in 2018, the best-ranked entrepreneurs were those operating in Professional, Scientific, Innovative and Technical Activities, while the worst-ranked are entrepreneurs operating in Accommodation and Food Services.
Keywords: entrepreneurs, economic activity, ratio analysis, PROMETHEE method, entropy method.
JEL classification: L26, M21

Сажетак: Велика стопа незапослености, низак ниво привредне активности и низак животни стандарад неки су од највећих проблема са којима се сусреће Република Србија у последњих неколико година. Развој малих и средњих предузећа и предузетника као велики потенцијал којим би се донекле решили ови проблеми још увек није довољно искоришћен. Имајући у виду значај развоја овог сегмента привреде, у овом раду је анализирано пословање предузетника према секторима делатности у 2018. години у Републици Србији, како би се одредиле привредне делатности које имају највећу перспективу за развој предузетништва у будућем периоду. Као полазна основа за компаративну анализу коришћена је рацио анализа пословања. Она је спроведена на бази података из „Годишњег билтена финансијских извештаја“ који објављује Агенција за привредне регистре за десет привредних делатности где су предузетници

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остварили највећу профитабилност. Применом ентропијске и PROMETHEE методе извршено је рангирање предузетника према секторима делатности. Добијени резултати указали су на то да су у 2018. години најбоље рангирани предузетници у сектору Стручне, научне, иновационе и техничке делатности, а најлошије рангирани предузетници који послују у сектору Услуге смештаја и и исхране.
Кључне речи: предузетици, привредна делатност, рацио анализа, PROMETHEE метод, ентропијски метод.
ЈЕЛ класификација: L26, M21

Introduction

As a transition country, the Republic of Serbia is facing problems of high unemployment, declining economic activity, low competitiveness, and lack of investments. These problems have been present mainly due to the inefficient and slow pace of reform processes to establish a market economy (Labus, 2020; Uvalić et al, 2020). This primarily refers to the inefficient privatization of state-owned and social enterprises, which was not accompanied by opening many new private companies (Ivanović & Kufenko, 2020).

In recent years, entrepreneurs have become significant factors in economic growth and employment (Toma, Grigore, & Marinescu, 2013; Omoruyi et al, 2017; Petrović & Leković, 2019), and thus the competitiveness of the economy, especially in developing countries (Boso, Story, & Cadogan, 2013). In these economies, entrepreneurs are also viewed as the greatest contributors to transforming an economic system (Kahrović, 2020). So, the increase of the number of new entrepreneurs in Serbia as a developing economy can reduce unemployment (Tošović-Stevanović & Bogdanović, 2018) and contribute to more efficient resource allocation, primarily since a large number of entrepreneurs operate in labour-intensive economic activities (Aničić, Aničić, & Vasić, 2017). At the same time, newly established entrepreneurs create value added, increase the demand for products of other economic entities, thus contributing to the GDP growth and the improvement of national competitiveness (Filipović, Nikolić, & Cvetanović, 2015; Ivanović-Đukić & Lepojević, 2017; Munitlak Ivanović, 2012). It is particularly important if we consider that the Serbian economy lags behind European Union (EU) economies in terms of competitiveness. The reasons for that are low productivity, low quality of products and services, outdated technology and equipment, high maintenance costs, and low usage of modern management tools and techniques, which negatively impact employee motivation and productivity (Vukotić, Milivojević, & Zakić, 2018).

Entrepreneurship in Serbia has gone through many phases of ups and downs during its development. In order to provide support to future entrepreneurs, the Agency for Small and Medium Enterprises and Entrepreneurship was established, which represented the impetus for the development of an institutional framework to encourage the development of small and medium enterprises (SME) and entrepreneurs. Realizing the importance of these companies and the necessity for their development, the government has adopted specific supporting measures in the following three forms (Ilić, 2018):

1. development policies (laws and strategies),
2. development of supporting institutions (business incubators, clusters, technology centres, industrial zones, etc.)

3. direct financial support programs (grants, loans) and various forms of non-financial assistance (training, information, counselling).

Despite the measures taken, due to the decline in economic activity, the unemployment problem is still present and can be solved by entrepreneurship development. The potentials for entrepreneurship development are still not sufficiently exploited. The main reasons for this are difficulties in access to finance, high operating costs, inability to connect with national, regional, and international markets (Majláth, Kelemen-Erdős, & Valocikova, 2019) and insufficient education of future entrepreneurs (Marčetić, Prlinčević, & Grujić-Vučkovski, 2020). These and many other factors have led to numerous oscillations in the SME economic activity and entrepreneurship development. However, the encouraging fact is that entrepreneurs still have a significant share in the economic structure of the Republic of Serbia (Radukić & Petrović, 2019). In this sense, this paper aims to identify the most prospective economic activities in which entrepreneurs operate and economic activities in which entrepreneurs face significant business constraints.

1. Methodology

Considering the importance of entrepreneurship for economic development, the main focus of this paper is to analyse the economic performance of entrepreneurs operating in the Republic of Serbia. An entrepreneur is a legally capable natural person who performs an activity to generate income and is registered as such according to the law on registration (Company Law of the Republic of Serbia). As numerous company laws changes have been adapted over time to bring them in line with EU legislation, this definition of entrepreneurs is comparable to that used in the EU. To achieve the defined aim of the paper, the authors selected the groups of entrepreneurs operating in ten economic activities where the highest profitability was recorded in 2018 and performed a comparative analysis of their economic performance. The most profitable economic activities are taken into account to identify the strengths and weaknesses of the most perspective economic activities. The data at the economic activity level are obtained from the *Annual Bulletin of Financial Statements* published by the Business Registers Agency. Each business entity is obliged to submit its balance sheet and financial statement to the Business Registers Agency at the end of each year. It summarizes the data based on several criteria: economic activity, region, size, etc. The economic entities are grouped in economic activities using the Statistical Classification of Economic Activities in the European Community, Rev. 2 (2008) (NACE Rev. 2). According to the mentioned bulletin, in 2018, 18.407 entrepreneurs were operating in the Republic of Serbia. By summarizing data collected, Business Registers Agency publishes balance sheets and financial statements at the economic activity level. Appropriate items from these financial reports are used to calculate ratios. The most profitable economic activities in 2018 (taken into account in this analysis) are: Manufacturing; Wholesale and retail trade; repair of motor vehicles and motorcycles; Professional, scientific, and technical activities; Construction; Transportation and storage; Human health and social work activities; Accommodation and food service; Financial and insurance; Administration and support service; Agriculture, forestry, and fishing. The comparative analysis of the

entrepreneurs from the observed economic activities was conducted by combining the PROMETHEE and entropy methods.

1.1. PROMETHEE method

Author Brans initially developed the PROMETHEE method (Brans, Mareschal, & Vincke (1984). Later, it was improved by Brans & Vincke (1985) and Brans & Mareschal (2005). This technique belongs to the group of "outranking" methods, which compares two or more alternatives according to all given criteria to identify the preference, i.e. dominance of one alternative over others.

PROMETHEE method requires defining specific parameters for each alternative, necessary for ranking them based on the selected criteria. The parameters that should be defined for the application of this method are:

1. The direction of preference – whether the given criterion should be minimized or maximized;
2. Weight coefficients – indicate the importance of a specific criterion for calculating the net preference flow. It should be borne in mind that the sum of all weight coefficients is equal to one.
3. Preference threshold (p) – the smallest difference between the two observed alternatives according to some criteria which the decision-maker considers significant for decision making;
4. Threshold of indifference (q) – the largest difference between the two observed alternatives according to the specific criterion which the decision-maker considers irrelevant for decision making;
5. Preference function – converts the difference between alternatives *a* and *b* into the preference level, which ranges from 0 to 1, for each observed criterion. The preference level of alternative *a* comparing to alternative *b*, which is closer to zero, indicates that alternative *b* is better than alternative *a* according to the selected criterion. Conversely, if this number is closer to 1, alternative *a* is better than alternative *b*.

After defining the mentioned parameters, the PROMETHEE method is conducted through several steps, resulting in net preference flow (Brans et al., 1984; Brans & Vincke, 1985; Brans & Mareschal, 2005; Doan & De Smet, 2018; Sarrazin, De Smet, & Rosenfeld, 2018). Based on the net preference flow's obtained value for each alternative, their ranking from the best to the worst is performed. The value of the net preference flow ranges from -1 to +1. At the same time, the best-ranked alternative has the highest positive net preference flow, and the worst-ranked alternative has the highest negative net preference flow.

The advantages of this method over other "outranking" methods are reflected in how the problem is structured, the amount of data that can be processed, and the ability to quantify qualitative measures, good software support and the presentation of the obtained results (Ilić, 2017).

1.2. Entropy method

Finding the effective solution for a multi-criteria decision-making problem requires an adequate approach for determining the weight coefficients because of their significant influence on the ranking of alternatives. Weight coefficients can be defined subjectively and objectively, depending on the source of information for their determination (Hwang & Lin, 1987). The subjectively determined weight coefficients reflect the subjective attitudes of decision-makers based on their preferences obtained through interviews, surveys, and organized meetings. Objective weight coefficients are those obtained based on accurate information, such as a decision matrix (Chen & Yang, 2011). Considering that this paper aims to analyse an economic problem, where a comparative analysis of entrepreneurs' businesses from selected economic activities in the Republic of Serbia should be performed as objectively as possible, it is more appropriate to use an objective approach defining weights. One of the most commonly used methods for objectively determining weight coefficients is the entropy method (Hwang & Yoon, 1981; Zeleny, 1982).

The information entropy is a measure of the disorder of the system. It enables the determination of the amount of useful information in the created data set. If there is a big difference in the value of a specific indicator, the entropy is small. In this case, the analysed parameter provides more information, so the indicator's weight will be higher. On the other hand, if the difference is smaller and the entropy is larger, the relative weight of that indicator will be lower.

2. Results and discussion

2.1. Ratio analysis of entrepreneurs' business by economic activities

Ratio analysis is a central part of financial analysis. It is based on examining the relationship between logically related parts of financial statements to highlight and explain the key relationships on which depends the current and future financial position and capabilities of the company that is the subject of analysis. In practice, the most commonly used are liquidity ratios, activity ratios, profitability ratios, and debt ratios. In this paper, the mentioned ratio indicators are used to analyse the critical aspects of entrepreneurs' business in economic activities that recorded the highest positive net result in 2018, i.e., the most profitable.

Liquidity ratio - the indicators that monitor the liquidity of entrepreneurs in this paper are the current ratio (CR), quick ratio (QR), and networking capital per employee (NWC). The liquidity ratios by economic activities for 2018 were analysed to determine the liquidity of entrepreneurs operating in selected economic activities in the Republic of Serbia (see Table 1).

Table 1: Liquidity ratios of entrepreneurs by economic activities in the Republic of Serbia in 2018

Economic activities	Current ratio	Quick ratio	Networking capital per employee
Manufacturing	1.15	0.64	1184.0
Wholesale and retail trade; repair of motor vehicles and motorcycles	1.27	0.46	1170.0
Professional, scientific, and technical activities	1.37	1.27	650.3
Construction	1.04	0.70	350.5
Transportation and storage	0.92	0.80	-364.2
Human health and social work activities	0.79	0.70	-551.3
Accommodation and food service activities	0.82	0.50	-372.8
Financial and insurance activities	1.79	1.69	651.5
Administration and support service activities	1.04	0.76	109.6
Agriculture, forestry, and fishing	0.92	0.60	-772.5

Source: the authors' calculations

The indicators shown in Table 1 indicate that the most favorable liquidity position has entrepreneurs operating in Financial and insurance according to the first two ratios. Due to many employees, this economic activity does not achieve the best results in terms of the third liquidity ratio. In addition, it should be emphasized that the values of liquidity ratios recorded in the Professional, scientific, and technical activities are also very favorable. Like in the economic activity mentioned above, the networking capital per employee is relatively low due to the many employees in this economic activity. The entrepreneurs operating in Wholesale and retail trade – repair of motor vehicles and motorcycles and Manufacturing are specific since the value of their networking capital per employee is very high, and they record a significant difference between the current ratio and quick ratio. The current ratio is at a satisfactory level with values of 1.27 and 1.15, respectively.

In contrast, the quick ratio is very low, i.e. 0.46 in the Wholesale and retail trade – repair of motor vehicles and motorcycles 0.64 in the Manufacturing economic activity. This situation results from the specificities of their business operations, which are based on holding and managing a large volume of inventories. Entrepreneurs operating in Human health and social work activities have the most unfavorable liquidity ratios. Agriculture, forestry, fishing and Accommodation, and food services are also characterized by very unfavorable liquidity ratios, indicating that these activities are faced with the problem of covering short-term liabilities from working capital.

Activity ratios, i.e. asset management indicators, measure the level of employment of assets and the degree of their exploitation. They are also called turnover ratios, and in this paper, the following ratios are used: customer turnover coefficient (CTC), average collection period (ACP), fixed assets turnover (FAT), and assets turnover (AR). To analyse the asset management indicators of entrepreneurs by economic activities the Republic of Serbia in 2018, Table 2 shows the values of these indicators for the observed activities.

Table 2: Activity ratios of entrepreneurs from selected economic activities in the Republic of Serbia in 2018

Economic activities	Customer turnover coefficient	Average collection period	Fixed assets turnover	Assets turnover
Manufacturing	2.15	167.25	1.34	0.48
Wholesale and retail trade; repair of motor vehicles and motorcycles	15.98	22.52	14.24	2.48
Professional, scientific, and technical activities	0.59	610.17	0.36	0.11
Construction	0.86	418.60	0.87	0.24
Transportation and storage	1.04	346.15	0.75	0.33
Human health and social work activities	0.18	2000.0	0.04	0.02
Accommodation and food service activities	11.13	32.35	2.16	0.98
Financial and insurance activities	9.33	38.59	2.33	0.23
Administration and support service activities	1.86	193.55	1.77	0.40
Agriculture, forestry, and fishing	2.28	157.89	1.41	0.54

Source: the authors' calculations

Based on the indicators shown in Table 2, it can be concluded that the Wholesale and retail trade holds the most favorable position according to all ratios; repair of motor vehicles and motorcycles economic activity. Entrepreneurs in this area have the highest customer turnover ratio, the shortest average collection period, the highest fixed assets turnover, and the highest assets turnover. The difference regarding the value of fixed assets turnover and assets turnover is particularly pronounced because this economic activity generates high revenues. On the other hand, it has a relatively low share of fixed assets in total assets. The Accommodation and food service activities also has favorable activity ratios. It is a consequence of good assets management in entrepreneurs' businesses operating in this economic activity. Entrepreneurs operating in Human health and social work activities have the most unfavorable asset management indicators. The customer turnover coefficient is as much as 15 times lower than the value of this indicator recorded in Wholesale and retail trade; repair of motor vehicles and motorcycles; repair of motor vehicles and motorcycles. In addition to this, the professional, scientific, and technical activities economic activity is characterized by very unfavorable activity ratios since all three observed turnover ratios are extremely low and the average collection period lasts over 600 days.

Profitability ratios show the profitability of the company, i.e. its ability to maximize profit with the lowest possible level of employed capital. In this paper, the following indicators are analysed: operating profit margin (OPM), net profit margin (NPM), return on total assets (ROA), return on equity (ROE), and efficiency coefficient (EC). For detecting the profitability of entrepreneurs' businesses operating in selected economic activities, the values of profitability ratios for 2018 were analysed (Table 3).

Table 3: Profitability ratios of entrepreneurs from selected economic activities in the Republic of Serbia in 2018

Economic activities	Operating profit margin (%)	Net profit margin (%)	ROA (%)	ROE (%)	Efficiency coefficient
Manufacturing	4.29	3.61	5.56	17.00	1.05
Wholesale and retail trade; repair of motor vehicles and motorcycles	2.37	2.00	5.33	26.00	1.03
Professional, scientific, and technical activities	25.96	12.11	21.35	55.00	1.34
Construction	7.56	5.35	7.27	30.00	1.08
Transportation and storage	5.94	5.13	7.80	28.00	1.06
Human health and social work activities	12.57	9.96	20.78	57.00	1.11
Accommodation and food service activities	1.58	2.19	4.77	26.00	1.03
Financial and insurance activities	-60.66	17.2	9.64	21.00	1.11
Administration and support service activities	6.99	4.23	8.27	57.00	1.07
Agriculture, forestry, and fishing	4.87	3.67	4.78	18.00	1.05

Source: the authors' calculations

Based on the profitability ratios shown in Table 3, it can be concluded that, according to most of the analysed indicators, the professional, scientific, and technical activities economic activity has the highest profitability. Interestingly, the operating profit margin is twice as high as the net profit margin in this economic activity, which indicates that entrepreneurs operating in this economic activity have recorded a loss based on financial operations and other activities. On the other hand, the entrepreneurs operating in the Financial and insurance activities have a negative and the lowest operating profit margin and the highest net profit margin compared to other activities. Accordingly, it can be concluded that these entrepreneurs record losses from doing their primary business activities, but they earn significant profit from financial transactions and other activities. The lowest values of almost all profitability ratios are recorded by entrepreneurs operating in Accommodation and food service economic activities.

Debt ratios show the relationship between owned and borrowed sources of financing, i.e. show the company's financial structure. In this paper, the efficiency of debt management is analysed based on the following two indicators: debt ratio (DR) and debt to equity ratio (DER). To examine how well entrepreneurs operating in selected economic activities managed their financial sources in 2018, the values of debt ratios for this year were considered (Table 4).

Table 4: Debt ratios of entrepreneurs from selected economic activities in the Republic of Serbia in 2018

Economic activities	Debt ratio	Debt to equity ratio
Manufacturing	67.49	2.08
Wholesale and retail trade; repair of motor vehicles and motorcycles	73.68	2.80
Professional, scientific, and technical activities	61.05	1.57
Construction	76.11	3.19
Transportation and storage	72.21	2.60
Human health and social work activities	63.82	1.76
Accommodation and food service activities	81.89	4.52
Financial and insurance activities	54.24	1.19
Administration and support service activities	85.37	5.83
Agriculture, forestry, and fishing	73.30	2.75

Source: the authors' calculations

Based on the debt ratios in Table 4, it can be concluded that the most favorable position according to the debt ratios held entrepreneurs operating in Financial and insurance activities. Although the indebtedness of this economic activity is relatively high, keeping in mind that almost half of its business funds are financed from borrowed sources. On the other hand, the economic activity with the most unfavorable indebtedness indicators is Administration and support service activities.

In the following section of the research, a comparative analysis of the entrepreneurs' performances in the analysed economic activities will be performed based on the results obtained by ratio analysis.

2.2. Ranking results

In order to conduct a multi-criteria analysis of the entrepreneurs operating in selected economic activities, it is necessary to reduce the number of indicators. In that way, the set of indicators that best reflects the analysed problem will be used for the analysis. The proper selection of indicators is of great importance for the final results of the research (Shannon, 1948). The first step in defining an adequate set of variables, the coefficient of variation and Pearson's correlation coefficient, were used. If the value of the coefficient of variation is higher than 0.1, the specific variable should be considered. After this, the correlation coefficient between pairs of indicators within each group of indicators was calculated. If the correlation coefficient between two indicators is lower than 0.7, both indicators should be considered because they have a different trend. On the other hand, the correlation coefficient higher than one indicates that two indicators follow almost the same trend, so one should be considered (He & Shang, 2017). The values of the coefficients of variation for the considered indicators are given in Table 4.

Table 4: Coefficients of variation for liquidity, activity, profitability, and debt ratios

Indicator	Coefficient of variation
Liquidity ratios	
Current ratio	0,27
Quick ratio	0,47
Networking capital per employee	3,32
Activity ratios	
Customer turnover coefficient	1,22
Average collection period	1,48
Fixed assets turnover	1,65
Assets turnover	1,24
Profitability ratios	
Operating profit margin	19,90
Net profit margin	0,76
ROA	0,66
ROE	0,51
Efficiency coefficient	0,08
Debt ratios	
Debt ratio	0,13
Debt to equity ratio	0,50

Source: the authors' calculations

The values of the coefficient of variation shown in Table 4 indicate that the efficiency coefficient should be excluded from further consideration because the coefficient of variation for this indicator is lower than 0.1.

The selection of indicators that will be taken into further analysis was conducted based on the results shown in Table 5. According to the value of the correlation coefficients, the following indicators were selected: quick ratio, net working capital, fixed assets turnover, average collection period, operating profit margin, net profit margin, ROA and debt to equity ratio.

Table 5: Correlation coefficients for the groups of indicators

	CR	QR	NWC	CTC	ACP	FAT	AT	OPM	NPM	ROA	ROE	DR	DER
CR	1												
QR	0,80	1											
NWC	0,68	0,23	1										
CTC				1									
ACP				-0,49	1								
FAT				0,81	-0,35	1							
AT				0,83	-0,43	0,96	1						

OPM								1					
NPM								-0,53	1				
ROA								0,27	0,64	1			
ROE								0,45	0,28	0,78	1		
DR												1	
DER												0,94	1

Source: the authors' calculations

As already mentioned, to conduct a multi-criteria analysis, it is necessary to define specific parameters for each indicator, which are shown in Table 6.

Table 6: Parameters of multi-criteria analysis for ranking the entrepreneurs by economic activities in the Republic of Serbia in 2018

	QR	NWC	FAT	ACP	NPM	OPM	ROA	DER
Direction of preference	Max	Max	max	min	max	max	max	max
Weighting Coefficient	0.09	0.11	0.09	0.10	0.10	0.30	0.14	0.08
Preference Function	Linear	Linear	Linear	Linear	Linear	Linear	Linear	Linear
p – preference threshold	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
q – indifference threshold	0.03	0.03	0.03	0.025	0.03	0.03	0.03	0.03

Source: the authors' calculations

Based on Table 6, it can be noticed that the Visual PROMETHEE software package recommended using the Linear function for the given data, with the corresponding preference and indifference thresholds, which are determined based on the range of entered values. Weight coefficients were obtained using the entropy method. The highest weighting coefficient, and thus the largest differences between the indicators, was obtained for the operating profit margin. In contrast, the lowest weighting coefficient was obtained for the debt to equity ratio.

After defining the parameters of the multi-criteria analysis, the entrepreneurs from selected economic activities were ranked, and the ranking results are shown in Table 7. In addition to the rank, Table 11 shows the net preference flow (Phi), positive preference flow (Phi +) and negative preference flow (Phi-).

Table 7: Ranking of entrepreneurs by economic activities in the Republic of Serbia in 2018

Rank	Alternative	Phi	Phi +	Phi -
1	Professional, scientific, and technical activities	0.4056	0.6860	0.2801
2	Administration and support service activities	0.2476	0.5685	0.3209
3	Construction	0.1346	0.5130	0.3784
4	Human health and social work activities	0.0909	0.5157	0.4248

5	Financial and insurance activities	0.0509	0.5102	0.4592
6	Transportation and storage	-0.0163	0.4364	0.4527
7	Wholesale and retail trade; repair of motor vehicles and motorcycles	-0.1315	0.3976	0.5291
8	Manufacturing	-0.1389	0.3694	0.5082
9	Agriculture, forestry, and fishing	-0.2978	0.2862	0.5840
10	Accommodation and food service activities	-0.3455	0.2946	0.6400

Source: the authors' calculations

According to the results presented in Table 7, it can be concluded that five out of ten observed activities have a positive net preference flow. Professional, scientific, and technical activities are the best-ranked economic activity with the highest positive net preference flow. The entrepreneurs from this economic activity have such a favorable position in final ranking due to high liquidity and profitability compared to other analysed economic activities. However, the activity ratios and debt ratios are quite unfavorable, so their future performances should be improved by better assets management and increase equity in order to use as few borrowed financing sources as possible. It is followed by the Administration and support service activities, Construction, Human health and social work activities, and Financial and insurance activities. The good results of entrepreneurs operating in Administration and support service activities result from relatively favorable profitability and debt ratios. Although they have a relatively high rigorous liquidity ratio due to the low level of inventories, their liquidity is not satisfactory due to the slow collection of receivables from customers, which reduces the amount of working capital at their disposal.

Similarly, the entrepreneurs operating in the Construction economic activity owe their favorable position to relatively high profitability and low indebtedness and slightly higher liquidity compared to other observed economic activities. Due to the character of their business operations, before all high levels of fixed assets and long-lasting production, they have unfavourable assets ratios comparing to other economic activities. The activities with a negative net preference flow are at the bottom of this list. These are Transportation and storage, Wholesale and retail trade, repair of motor vehicles and motorcycles, Manufacturing, Agriculture, forestry, and fishing and Accommodation and food service activities. The last two economic activities have significant obstacles in doing business, although the Republic of Serbia has very favorable conditions for developing these economic activities. The limitations of entrepreneurs operating in Agriculture, forestry, and fishing are considerably lower liquidity and profitability than other economic activities. To help these entrepreneurs to overcome these problems, the government should provide them with financial support to procure the necessary equipment. That will enable them to reduce the cost price and achieve higher profitability through higher sales and a greater difference between the selling price and the cost price. It would also have significant positive effects on their liquidity. In the less favorable position are entrepreneurs operating in Accommodation and food service activities, due to even worse results in terms of liquidity and profitability in comparison to those operating in Agriculture, forestry, and fishing. The government should support the liquidity and profitability of these entrepreneurs through adequate credit policy and obtaining government guarantees to increase and improve their capacities and support their networking and joint presence on the international market.

Conclusion

Entrepreneurship development and establishment of new entrepreneur' businesses in the Republic of Serbia are crucially important for the recovery and development of the Serbian economy, increasing employment and improving the national standard of living. The emergence of entrepreneurship has brought many opportunities, which have to be utilized in the right way. To fully exploit the potential for entrepreneurship development, a strategic approach to the development of this economic activity is required.

This research indicated that the number of entrepreneurs' businesses and their employees in the Republic of Serbia increased in 2018 compared to the previous year. It is a step forward in the development of entrepreneurship. However, there is still space for further increase in the number of entrepreneurs' businesses and the number of employees. It should be noted that more than a third of entrepreneurs operate in the economic activity of wholesale and retail trade – repair of motor vehicles and motorcycles. So, it is necessary to change the structure of entrepreneurs' businesses, i.e. increasing the number of them that produce so-called tradable goods and services. It primarily refers to the increase in the number of entrepreneurs operating in Manufacturing, Agriculture, forestry, fishing, and Accommodation and food service activities. Particular attention should be paid to Manufacturing, which has significant potential to increase employment. This potential is indicated by the fact that the share of these entrepreneurs' businesses in 2018 was twice lower than those operating in the Wholesale and retail trade – repair of motor vehicles and motorcycles. However, their share in total employment is slightly higher than in the latter economic activity.

The ratio analysis results indicated that the most favourable outcomes in liquidity and debt management have entrepreneurs operating in the financial and insurance activities economic activity. The most efficient asset management has entrepreneurs in the Wholesale and retail trade – repair of motor vehicles and motorcycles. At the same time, the highest profitability is achieved by entrepreneurs operating in Professional, scientific, and technical activities. According to all analysed indicators, the application of PROMETHEE and the entropy method indicated that entrepreneurs in the economic activity of Professional, scientific, and technical activities have the most favorable business economy. On the other hand, a positive net preference flow was obtained for entrepreneurs operating in Administration and support service activities, Construction, Human health and social work activities, and Financial and insurance activities.

On the other hand, entrepreneurs operating in Accommodation and food service activities have the most unfavorable performance. Keeping in mind the tourist potentials of the Republic of Serbia and the labour-intensive character of this economic activity, it is necessary to provide significant government support to this economic activity to fully exploit the possibilities of this economic activity, increase employment and ensure more balanced regional development. Generally observed, most economic activities with positive net preference flow are from service economic activities. It is necessary to create a

favorable business environment for entrepreneurship development in economic activities that produce and trade goods, which have significant obstacles in doing business.

References

Agencija za privredne registre, (2019). *Godišnji bilten finansijskih izveštaja za 2018. godinu*, https://apr.gov.rs/upload/documents/Bilten%202019.pdf

Aničić, J., Aničić, D., & Vasić, N. (2017). Entrepreneurship development and financial performances in SMEs economic activity in Serbia. *Ekonomika*, *63*(4), 29-39. Doi: https://doi.org/10.5937/ekonomika1704029A

Boso, N., Story, V. M., & Cadogan, J. W. (2013). Entrepreneurial orientation, market orientation, network ties, and performance: Study of entrepreneurial firms in a developing economy. *Journal of Business Venturing*, *28*(6), 708-727. Doi: https://doi.org/10.1016/j.jbusvent.2013.04.001

Brans, J. P., & Mareschal, B. (2005). Promethee Methods. Chapter 5 in: *Multiple Criteria Decision Analysis: State of the Art Surveys*, Springer Science and Business Media, Boston, 163-186. Doi: https://doi.org/10.1007/0-387-23081-5_5

Brans, J. P., & Vincke, P. (1985). A preference ranking organization method: The PROMETHEE method for MCDM. *Management Science*, *31*, 647-656. Doi: http://dx.doi.org/10.1287/mnsc.31.6.647

Brans, J. P., Mareschal, B., & Vincke, P. (1984). PROMETHEE: A new family of outranking methods in multi-criteria analysis. *Operational Research*, *3*, 477-490.

Chen, Z., & Yang, W. (2011). A MAGDM based on constrained FAHP and FTOPSIS and its application to supplier selection. *Mathematical and Computer Modelling*, *54*(11-12), 2802-2815. Doi: https://doi.org/10.1016/j.mcm.2011.06.068

Doan, N. A. V., & De Smet, Y. (2018). An alternative weight sensitivity analysis for PROMETHEE II rankings. *Omega*, 80, 166-174. Doi: https://doi.org/10.1016/j.omega.2017.08.017

Filipović, M., Nikolić, M., & Cvetanović, S. (2015). Development of entrepreneurial economic activity as the basis for strengthening competitiveness. *Ekonomika preduzeća*, *63*(3-4), 205-221. Doi: https://doi.org/10.5937/ekopre1504205F

He, J., & Shang, P. (2017). Comparison of transfer entropy methods for financial time series. *Physica A: Statistical Mechanics and Its Applications*, *482*, 772-785. Doi: https://doi.org/10.1016/j.physa.2017.04.089

Hwang, C. L., & Lin, M. J. (1987). *Group Decision Making Under Multiple Criteria: Methods and Applications*. Springer-Verlag, Berlin Heidelberg.

Hwang, C. L., & Yoon, K. (1981). *Multiple attributes decision-making methods and applications*. Berlin: Springer.

Ilić, Đ. D. (2018). Razvoj i mesto preduzetništva u privredi Republike Srbije. *Trendovi u poslovanju*, *1*(11), 1-10.

Ilić, I. (2017). Ranking different types of tourist accommodation facilities in Serbia using PROMETHEE-GAIA method. *Menadžment u hotelijerstvu i turizmu*, *5*(1), 28-35.

Ivanović, V., & Kufenko, V. (2020). *It's a man's world? The rise of female entrepreneurship during privatization in Serbia*. Hohenheim Discussion Papers in Business, Economics and Social Sciences, No. 07-2020, Universität Hohenheim, Fakultät Wirtschafts- und Sozialwissenschaften, Stuttgart, available at: http://nbn-resolving.de/urn:nbn:de:bsz:100-opus-18099

Ivanović-Đukić, M., & Lepojević, V. (2017). Preferences in self-employment and entrepreneurship in the Republic of Serbia: Gender analysis. *Teme*, *16*(3), 731-746. Doi: https://doi.org/10.22190/TEME1703731I

Kahrović, E. (2020). Entrepreneurial universities and intermediary organizations as a success factor in SMEs: literature review. *Ekonomika preduzeća*, *68*(3-4), 229-247. Doi: https://doi.org/10.5937/EKOPRE2004229K

Labus, M. (2020). Transition and post-conflict macroeconomic policies in Serbia. *Economic Annals, 65*(226), 73-102. Doi: https://doi.org/10.2298/EKA2026073L

Majláth, M., Kelemen-Erdős, A., & Valocikova, C. (2019). Understanding SME's failure–focus on success factors and gender differences: comparative analysis of SME's in Czech Republic, Hungary and Serbia. *Serbian Journal of Management*, *14*(2), 327-344. Doi: https://doi.org/10.5937/sjm14-23491

Marčetić, M. N., Prlinčević, G. T., & Grujić-Vučkovski, B. (2020). An assessment of the effects and influences of the concept of entrepreneurial learning in Serbia. *Anali Ekonomskog fakulteta u Subotici*, 44, 49-61. Doi: https://doi.org/10.5937/AnEkSub2145097K

Munitlak Ivanović, O. (2012). Strategic Management in Entrepreneurship – Challenges of Growth Strategy. *Poslovna ekonomija: časopis za poslovnu ekonomiju, preduzetništvo i finasije*, *10*(1), 11-26.

Omoruyi, E. M. M., Olamide, K. S., Gomolemo, G., & Donath, O. A. (2017). Entrepreneurship and economic growth: Does entrepreneurship bolster economic expansion in Africa. *Journal of Socialomics*, *6*(4), 1-11. Doi: https://doi.org/10.4172/2167-0358.1000219

Petrović, M., & Leković, B. (2019). Characteristics of ambitious entrepreneurs in Southeast Europe region: High-growth expectation concept. *Anali Ekonomskog fakulteta u Subotici*, 55(41), 55-66. Doi: https://doi.org/10.5937/AnEkSub1941055P

Radukić, S., & Petrović, J. (2019). An Analysis of the Development of Entrepreneurship in the Republic of Serbia with a Special Focus on Female Entrepreneurship. *Journal of*

Women's Entrepreneurship and Education, (1-2), 1-16. Doi: https://doi.org/10.28934/jwee19.12.pp1-16

Republički zavod za statistiku (2008), Statistička klasifikacija ekonomskih delatnosti EZ (rev. 2), https://www.stat.gov.rs/media/2622/klasifikacija-delatnosti-2010.pdf

Sarrazin, R., De Smet, Y., & Rosenfeld, J. (2018). An extension of PROMETHEE to interval clustering. *Omeg*a, 80, 12-21. Doi: https://doi.org/10.1016/j.omega.2017.09.001

Shannon, C. E. (1948). A mathematical theory of communication. *The Bell System Technical Journal*, *27*(3), 379-423. Doi: https://doi.org/10.1002/j.1538-7305.1948.tb01338.x

Toma, S. G., Grigore, A. M., & Marinescu, P. (2014). Economic development and entrepreneurship. *Procedia, Economics and Finance*, *8*, 436-443. Doi: https://doi.org/10.1016/S2212-5671(14)00111-7

Tošović-Stevanović, A., & Bogdanović, D. (2018). Youth unemployment and entrepreneurship in Serbia. *Megatrend revija*, *15*(3), 129-144. Doi: https://doi.org/10.5937/MegRev1803129T

Uvalić, M., Cerović, B., & Atanasijević, J. (2020). The Serbian economy ten years after the global economic crisis. *Economic Annals*, *65*(225), 33-71. Doi: https://doi.org/10.2298/EKA2025033U

Vukotić, S., Milivojević, T., & Zakić, N. (2018). Theory, Practice and Characteristics of Management in Serbia. *International Journal of Advances in Management and Economics*, *2*(2), 63-75.

Zeleny, M. (1982). *Multiple Criteria Decision Making*. McGraw Hill, New York.

Zakon o privrednim društvima ("Sl. glasnik RS", br. 36/2011, 99/2011, 83/2014 - dr. zakon, 5/2015, 44/2018, 95/2018 i 91/2019),

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Digital workplace – advantages and challenges

Дигитално радно место – предности и изазови

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Abstract: Digital transformation is performed through the integration of information technologies into all areas of a business. The changes are radical, comprehensive and as such, they affect workplaces as well. Many authors overemphasize the use of technologies and regard them as central to the digital workplace. On the other hand, the position of the authors who argue that the digital workplace should coordinate technologies, processes and people is more correct. Theoretical research often does not clearly define the term digital workplace. Furthermore, the studies often overemphasize only the benefits while omitting the challenges presented by the digital workplace implementation. Therefore, the paper presents the requirements for a workplace to be considered digital, its advantages and challenges, and it shows how to balance the positive and negative repercussions of workplace digitalization.
Keywords: digital workplace, digital transformation, advantages, disadvantages.
JEL classification: M15, O39

Сажетак: Интегрисањем информационих технологија у све области пословања врши се његова дигитална трансформација. Промене су корените, свеобухватне и као такве, имају утицаја и на радна места. Многи аутори у оквиру дигиталног радног места пренаглашавају употребу технологија те технологије постављају у централно место. Са друге стране, исправније је становиште аутора који истичу да дигитално радно место треба да координише технологије, процесе и људе. Теоријска истраживања често не дефинишу јасно појам дигиталног радног места. Такође, радови често превише наглашавају само предности истовремено изостављајући изазове које имплементација дигиталног радог места носи. Због тога је у раду приказано шта је потребно да би се радно место сматрало дигиталним, које су његове предности и изазови и како успоставити равнотежу између позитивних и негативних реперкусија дигитализовања радних места.
Кључне речи: дигитално радно место, дигитална трансформација, предности, недостаци.

ЈЕЛ класификација: M15, O39

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Introduction

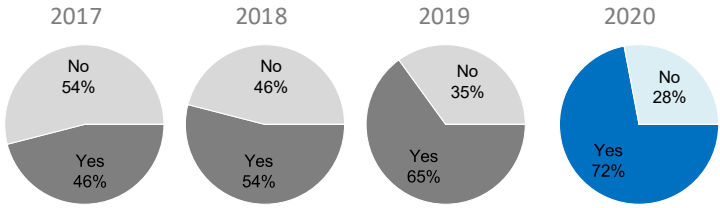
The Fourth Industrial Revolution, often referred to as Industry 4.0, introduces increasing challenges to organisations. Organisations operate in a "volatile, uncertain, complex and ambiguous" environment (Brahma et al., 2021). Technology has an impact on entire organisations but also on workplace. Meske and Junglas (Meske & Junglas, 2020; Meske, 2019;) point out that scant attention is paid to the micro level of digital transformation of the workplace, i.e. the environment of an individual who performs the work including the tools that support or hinder that work. According to Jeffrey Mann (Mann, 2019), "you cannot become a digital business unless you have a digital workplace", i.e. a digital workplace is a 'must-have' practice (Haddud & McAllen, 2018). Office work is becoming less routine and repetitive, and more knowledge-based. This term, *knowledge-based*, was introduced by Peter Drucker (mentioned by Berg & Gustafsson, 2018) to describe such workplaces but also employees whose main asset is their knowledge. Workers employed in *knowledge-based* workplaces are *knowledge workers*.

In performing work by knowledge workers (but not exclusively by them), timely access to relevant information is a condition *sine qua non*, wherein ICT technologies are of determining significance. They have increasing requirements regarding the implementation of modern technologies in the workplace (Zrinscak, Perl, & Robra-Bissantz, 2017). Notwithstanding the previous statement, Attaran, Attaran and Kirkland (Attaran, 2019) point out, however, that technologies alone cannot solve certain business issues. Therefore, organisations should equally focus on the skills and knowledge of employees, the lack of which make technologies (almost) worthless, and in some cases technologies can even have a negative impact (Hicks, 2019). The views expressed are particularly important in the context of digital workplaces.

Even though companies might have had reservations concerning digital, relocated, virtual workplaces before the COVID-19 pandemic, it is certainly different now. It is high time to design/redesign workplaces to support all forms of interaction whether direct or remote between employees (de Lucas Ancillo, del Val Núñez, & Gavrila, 2020). According to some data, (only) 15% of employees worked from home before the pandemic. At the beginning of the pandemic, this percent was increased by additional 35% (Deloitte, 2020). Similar data can be found in the work of de Lucas Ancillo et al. (2020), where only 3% of office space was considered flexible in the USA prior to COVID-19 (option to work in and out of the office), but now this percentage is projected to range between 20 and 27%. Here lies the potential to reduce estate costs from 30% to as much as 100% for completely remote jobs. Acceleration of digital transformation is a driver of remote work and the workplace transformation, and it reveals important gaps in IT infrastructure, workforce planning and digital skills development. The report published by Simpler Media Group (2020) specifies a great challenge for people who worked remotely during the pandemic to return to their offices, taking into account the fact that 60% of workers who switched to remote work point out that they have achieved a better work-life balance, i.e. 74% of workers want to continue working from home even after the pandemic ends. Similar predictions were made by Gartner (Moore, 2020) in 2019, stating that only a third of

workers would choose the corporate office as their preferred place to work. According to the data presented by the same company, almost half of the workers (48%) will work remotely to some extent post-COVID-19 (Moore, 2020). All this imposes the need for a strategy for implementing digital workplaces even beyond the pandemic, as shown in Figure 1. In the total number of surveyed companies during the 2017-2020 period, as showed below, a growing trend can be observed for companies with a defined strategy of digital workplace as opposed to companies without a defined strategy (Simpler Media Group, 2019, 2020).

Figure 1: Implemented digital workplace strategy or program



Source: Simpler Media Group, 2020

The same research (Simpler Media Group, 2020) specifies five main priorities of the digital workplace: integrated digital workplace environment, process digitalization and improvement, culture and change, big data (advanced analytics and decision-making support) and standardization of tools and processes.

The available literature lacks consensus on the definition of a digital workplace. On the one hand, some authors (over)emphasize technology, but on the other, many authors regard technology only as one of the (key) elements of the digital workplace. Numerous advantages presented by the digital workplace are evident and they are (too) often in the foreground, while the challenges and negative consequences of the digital workplace are often neglected. Therefore, the paper focuses on the digital workplace viewed through the prism of various factors that make it up, as well as the advantages and challenges imposed by the digital workplace.

1. Digital workplace

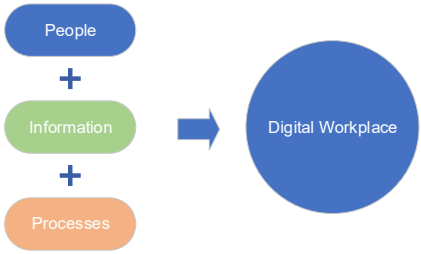
Authors define the digital workplace differently, often overemphasizing technology. Hamburg (Hamburg, 2020), for instance, points out that "the digital workplace includes all digital technologies and services people use to get work in today's workplace – both those which already exist and ones to be implemented". Besides core business applications, the author's definition encompasses e-mail, instant messaging, social media tools, and virtual meeting tools. On the other hand, Attaran, Attaran and Kirkland (2020) stress that some organisations are incorrect in believing that e-mail and social media are the only necessary tools for the digital workplace and that digital transformation is a mere integration of digital

technologies. The same authors emphasize the claim that most efforts in digital transformation fail due to inadequate corporate culture.

Williams and Schubert (2018) explored definitions of the digital workplace and identified three thematic categories: 1) organisational strategy and design, 2) people and work, and 3) technology platform. The first thematic category, Organisational strategy and design, sees the digital workplace as part of a coordinated organisational strategy for changing culture, and creating a new workplace that will support collaborative and flexible work. The strategy should be adaptive and future-oriented, and at the same time compliant with the relevant laws and regulations. The second thematic category identified, People and work, relates to the need to enable employees to be productive, which is accomplished by meeting user's needs for data, information, and knowledge. These authors attach specific emphasis to supporting information work, knowledge work, employee engagement, collaboration, and information sharing. The third thematic category, Technology platform, emphasizes the need to implement an integrated platform that provides the tools and functionality needed to support employees. This platform should be integrated with other systems and services, and independent of location. Based on the thematic categories they had specified, Williams and Schubert (2018) finally defined the digital workplace as "an integrated technology platform that provides all the tools and services to enable employees to effectively undertake their work, both alone and with others".

According to Attaran et al. (2020), the digital workplace encompasses solutions that create connections and remove barriers between people, information and processes (Figure 2). The mentioned authors believe that by breaking down barriers, workers will do their job more efficiently and more agile. Similarly, Lestarini, Raflesia, and Surendro (2015) stress that the digital workplace coordinates technology, processes and people. They emphasize that the desired feature of the digital workplace is achieved by integrating the following four types of technologies: mobile, big data, cloud computing and search-based applications.

Figure 2: Breaking down barriers and creating connections



Source: Attaran et al., 2020

As mentioned earlier, technologies should not be the exclusive way towards the implementation of the digital workplace, but a more holistic approach is needed, which will take into account all the perspectives of the digital workplace. In this respect, Attaran et al. (2019) identified a framework for the digital workplace (Figure 3) that includes three building blocks: personal performance, team performance and organisational performance.

Figure 3: A framework for the digital workplace

Source: Attaran et al., 2019

According to Constant (2017, mentioned by Attaran et al., 2019), the pillars of a digital workplace are: the agile workplace, digital technology, and collaboration. In the authors' opinion, the agile workplace implies a change of physical workplace primarily through the integration of front and back-office tools. This integration is achieved by carefully designing the infrastructure of adequate technologies. Part of these technologies supports the flow of information through the organisation, which enables and facilitates collaboration between employees. Collaborative technologies should include collaborative platforms, social media tools, intranet, and the Internet (Attaran et al., 2019). These technologies will enable work to be done regardless of time and space constraints, which at the same time often blurs the boundaries between the private and business time of employees (Brahma, Tripathi, & Sahay, 2021; Colbert, Yee, & George, 2016).

2. Advantages and challenges of the digital workplace

Creating a digital workplace involves implementing a large number of software tools that should support business processes within an organisation. Therefore, the digital workplace cannot be observed separately from modern software tools, but as already mentioned, the strategy of relying solely on tools is wrong. The digital workplace causes changes in the execution of tasks and processes as well as in the social relations in the organisation and transforms the entire work experience (Meske & Junglas, 2020). Although the digital workplace is mostly discussed in a positive context, i.e. its positive aspects are emphasized, the digital workplace is not immune to many challenges. The following are the advantages and challenges associated with the digital workplace, as well as suggestions for balancing the characteristics of the digital workplace.

2.1 Advantages of a digital workplace

Digital workplace technologies provide the infrastructure for ubiquitous work (Schmidt, Praeg, & Gunther, 2018), i.e. work regardless of time and location. The most common positive side of the implementation of the digital workplace is the increase in productivity and performance of employees (Attaran et al., 2019; Haddud & McAllen, 2018; Gerten Beckmann, & Bellmann, 2019). Increased productivity can be attributed to various benefits of the digital workplace. One of these benefits is the possibility of internal crowd work,

which, according to Meske and Junglas (2020), can lead to outstanding results and competitive advantages of the organisation. Cost optimization is also one of the advantages of a digital workplace. Haddud and McAllen (2018) give an example of a direct positive impact on costs in which organisations employ workers with the necessary competencies regardless of their location, thus reducing labour costs.

There is a growing need to enable the efficient exchange of knowledge between mobile workforce (Brahma et al., 2021; Kissmer, Knoll, Stieglitz, & Groß, 2018). Mobility provides freedom, autonomy (Gerten et al., 2019) and flexibility in choosing where, when and how to work (Vallo Hult & Byström, 2021), which ultimately leads to greater job satisfaction (Attaran et al., 2019), and thus higher productivity.

Increasing networking and collaboration within the organisation is one of the imperatives set up by a digital workplace. Although digital workplace tools enable and encourage employee independence, they also enable them to stay and become connected to others (both with people from and outside the organisation) (Meske & Junglas, 2020). The digital workplace provides faster access to the required information and employees will be able to meet customer needs faster and thus improve their experience with the organisation (Haddud & McAllen, 2018). This improves involvement and engagement (Md Dahlan, Abdullah, & Suhaimi, 2018) of employees whose goals are increasingly aligned with the organisation's business goals (Corbin-Herbison, 2019). The digital workplace creates new effective communication channels that foster collaboration and provide a better user experience with easy access to information (Corbin-Herbison, 2019). Increasing connectivity has a positive effect on innovation within an organisation (Haddud & McAllen, 2018; Attaran et al., 2019).

Lestarini et al. (2015) state that the digital workplace improves employee satisfaction and thus their engagement which further leads to improved product quality, agility and efficiency, as well as reducing errors in work (Brahma et al., 2021).

Another benefit of the digital workplace, which will become increasingly important in the years to come, is talent attraction and retention and employee retention levels (Haddud & McAllen, 2018). Corbin-Herbison (2019) reveal that employee satisfaction is improved by introducing social media to organisations, and the generations to come (millennials and Generation Z) expect a digital workplace.

All the above benefits achieved through the successful implementation of a digital workplace can be viewed from the perspective of an individual, but also from the perspective of an organisation. Based on a review of the literature and the work of Attaran et al. (2019), Lagus (2020) summarized in his research the benefits of the digital workplace for organisations and individuals, i.e. employees (Table 1).

Table 1: Benefits of the digital workplace

Benefit	Employee	Organisation
Empowers employees with a richer IT experience - flexibility and personalization: modern digital platforms are mobile-first designed and primarily employee-centric.	✓	
Provides a consistent user experience across all devices	✓	
Raises employee engagement	✓	
Helps employee experience greater flexibility and choice	✓	
Helps to improve employee and customer experience	✓	
Enables access to expert knowledge and discovery of project-critical information	✓	
Improves communication interfaces and collaboration	✓	
Enables agility	✓	
Prevents time wasted in recreating information that already exists	✓	
Reduces employee absenteeism	✓	
Decreases staff turnover.		✓
Enable secure access for users, from anywhere at any time. Provided online communication, access to tools and corporate information, regardless of location and time.	✓	
Supports closer collaboration with customers, partners & co-workers	✓	
Accelerates decision-making and innovation		✓
Provides more effective ways of working – Increases productivity: modern platforms of the digital workplace provide highly personalized information, and access to the required information is improved by searching and delivering localized content.	✓	✓
Speeds up the release of new products and services		✓
Provides efficient information distribution channels		✓
Strengthens talent attraction and retention. An innovative environment will attract and retain the best employees.		✓
Prevents information overload		✓
Reduces sales cycles		✓
Exploits consumer-oriented styles and technologies		✓
Increases the chance of a project successfully meeting its outcomes by using cross-functional teams		✓
Facilitates technical improvements including better performance, platform support, improved security, etc.		✓
Enables environmental gains due to a reduction in travel (thereby improving the carbon footprint)		✓
Leads to changes in the work styles of employees that enable more transparent work		✓
Reduces waste by removing distractions and time wasters such as inefficient meetings, managing emails, searching for people and information, and re-creating work that has already been done	✓	
Improves feedback and performance management: modern digital workplaces enable continuous monitoring of employees.		✓

Source: Lagus, 2020 based on the work of Attaran et al., 2019; Attaran et al., 2020; Hamburg, 2020; Shivakumar, 2020

2.2 Challenges of the digital workplace

Besides the benefits, the digital workplace also brings numerous challenges to a business. Organisations and individuals must be aware of these challenges, in order to minimize them and make the most of the benefits of the digital workplace.

The most common challenges of the digital workplace, as well as the implementation of ICT technologies in an organisation, are related to security issues (Attaran et al., 2019; Haddud & McAllen, 2018) and data protection: intellectual property, and trade secrets, both for organisation's research and development activities and ongoing projects. Another challenge that organisations have is in balancing local, global and international systems (linkages between systems), while managing the spread and reach of their products, their diverse markets, vendors and suppliers (Brahma et al., 2021). The lack of a clear distinction between tools and business needs can make information management systems inefficient (Attaran et al., 2019).

Flexibility and accessibility are generally seen as benefits of the digital workplace. However, their negative aspects should not be ignored, as they include stress (often called technostress) as well as the inability to establish a clear boundary between private and working life (Vallo Hult & Byström, 2021), resulting in a security and privacy issue again (Vallo Hult & Byström, 2021). Kalischko and Riedl (2021) reveal that the spread of technology in the workplace leads to technostress, which later can cause fatigue, burnout, depression and reduced employee satisfaction. Consequently, the duality of the impact of the digital workplace is obvious since the impacts can often be viewed from the aspect of both advantage and challenge. In addition to the autonomy they provide, digital workplace technologies make it easier to monitor employee performance (Gerten et al., 2019) and lead to loss of privacy (Brahma et al., 2021), which can result in reduced employee satisfaction, since according to Kalischko and Redl (2021), monitored employees are less satisfied with the job than those who are not monitored.

Individuals and organisations face yet another challenge and that is the necessary competencies (Vallo Hult & Byström, 2021), which often lead to insufficient internal resources in terms of competencies and training (Attaran et al., 2019). There is an increasing need for knowledge workers with specific digital competencies (Erceg & Zoranović, 2020), and organisations are having difficulties finding them, and once they have found them, how to motivate them to stay so their engagement is at an adequate level (Brahma et al., 2021). Furthermore, digital workplace requires different management, which poses new challenges to managers who often lack the appropriate competencies to design and manage a digital workplace (Haddud & McAllen, 2018; Vallo Hult & Byström, 2021)

New tools that are constantly being implemented within the digital workplace can also cause stress to employees. Fossilization of employees' habits often causes resistance to change (Corbin-Herbison, 2019), and therefore employees prefer familiar tools and they often solve new problems by using old tools (Moore, 2020). Furthermore, these tools cause a high dependence on technologies to perform everyday tasks and at the same time lead to increased costs due to the need for constant software updates (Corbin-Herbison, 2019).

The digital workplace improves communication and collaboration while reducing traditional communication methods which can lead to a loss of interpersonal communication skills. This is reflected in reduced opportunities for employees to physically communicate and integrate with their peers (Corbin-Herbison, 2019), which can often cause a feeling of isolation.

Having in mind the above mentioned challenges, it is possible to summarize them as follows (Deloitte, 2020; Hicks, 2019):

- Negative impact on productivity. Deloitte (Deloitte, 2020) reveals that distractions and poor supervision can hinder cooperation and negatively affect productivity. Employees who work remotely rely solely on digital communication, and are thus deprived of information shared through personal conversations or other non-organisational channels. All this can negatively affect productivity, create information silos and lead to duplication of work (Hicks, 2019).
- Relationship building and onboarding. Weak relationships between employees can become even weaker, while it is more challenging to build relationships with the newly-employed (Deloitte, 2020).
- Negative impact on development and learning. A virtual environment can negatively impact development and learning (Deloitte, 2020)
- Negative impact on innovation. The loss of serendipity that is often associated with closer employee interaction (Deloitte, 2020).
- Security issues. The digital workplace is increasingly exposed to hacking or accidental leaks of corporate data. Employees are often unfamiliar with security protocols for exchanging information through the corporate intranet (Hicks, 2019).

2.3 Balance in the digital workplace

Vallo Hult and Byström (2021) emphasize the need for a holistic approach to the digital workplace, finding a balance between protected and open information as well as the choice of tools. As already mentioned above, many characteristics of a digital workplace can be both advantages and challenges at the same time and this is often referred to as the digital workplace paradox (Bader & Kaiser, 2017; Blegind Jensen & Stein, 2021). For instance, autonomy and control are paradoxical because the existence of control prevents autonomy and vice versa (Bader & Kaiser, 2017).

Implementing the digital workplace will require a balance between the following opposites - paradoxes (Europese Commissie, 2017):

- Freedom and security. IT risks can be reduced by constraining users which also leads to reduced productivity.
- Simplicity and choice. Simplicity facilitates IT management, but at the same time reduces the number of functionalities offered to the user.

- Corporate devices and user devices. The boundaries between work and private life have faded, and users are increasingly using their own devices and applications for business purposes.
- Bundle and fragmentation. Big software vendors offer numerous, very well-integrated products that cover almost all aspects of the digital workplace. Besides the undoubted benefits that such bundles offer, there is also the threat of being dependent on only one software manufacture. Solutions offered by small software companies and the possibility of their integration into the digital workplace should certainly be taken into account.

Conclusion

The scientific community is obviously interested in the field of digital workplace. As already mentioned in the paper, authors often overemphasize the role of technologies within the digital workplace, often omitting other dimensions of the digital workplace. The available literature lacks clear consensus regarding the definition of a digital workplace. Since the digital transformation of the workplace is a continuous process that has been taking place in the last few decades, it is very difficult, if at all possible, to make a clear distinction between a "traditional" workplace and a digital workplace. Additional, primarily empirical research is needed in this area, which would first identify the key characteristics of the digital workplace and then its critical success factors.

Implementing the digital workplace has become an imperative for many companies, and it should not be solely guided by technology, while neglecting people, information and processes. Correlating technologies with these three categories, along with breaking down barriers between them, is at the core of the digital workplace. Adequate implementation of the digital workplace provides numerous benefits (but also challenges) and will be a strong factor in the future for attracting quality knowledge workers. The digital workplace should positively affect employee productivity and at the same time reduce distractions and waste of time.

Although the digital transformation of organisations and thus workplaces is largely underway, the research mentioned by Altari et al. (Attaran et al., 2019) emphasizes that most employees think that their workplace is not smart enough, that they often waste time due to inadequate technology, and that technology they have available at their home is often more advanced than the one available at their workplace. Organisations that have not yet performed the digital transformation of the workplace should keep in mind the challenges that such a transformation brings, as well as the dangers of relying solely on technology. It is necessary to establish a cross-functional implementation team tasked to create and implement a digital workplace strategy in accordance with business needs (Attaran et al., 2019). Employees should be involved in the digital transformation of the workplace, because in most cases they want both to support and participate in the transformation process, and to be active in designing a new environment (Meske & Junglas, 2020).

The COVID-19 pandemic has further accelerated the process of digital transformation of workplaces. Organisations are increasingly aware of the need to implement a digital workplace, which can greatly reduce the cost of replacing office spaces with home offices or offices close to employees' home (de Lucas Ancillo et al., 2020). De Lucas Ancillo et al. (2020) stress that the digital transformation of workplaces often reveals gaps within IT infrastructure, workforce planning and the development of the necessary digital skills. In the future, most organisations are likely to implement digital workplaces that will enable a hybrid form of work - working both in the office and from home (Samek Lodovici et al., 2021), which will completely erase the physical boundaries of workplaces because "the workplace is where the work is" (Evans-Greenwood, Stockdale & Patston, 2021). Advantages of the hybrid model, according to DeSoto (DeSoto, 2021), are reduced costs, increasing team member satisfaction, improving employee relationships, and improving productivity and efficiency.

References

Attaran, M., Attaran, S., & Kirkland, D. (2019). The need for digital workplace. *International Journal of Enterprise Information Systems*, *15*(1), 1–23. Doi: https://doi.org/10.4018/IJEIS.2019010101

Attaran, M., Attaran, S., & Kirkland, D. (2020). Technology and organizational change: harnessing the power of digital workplace. In I. Efosa (Ed.), *Handbook of Research on Social and Organizational Dynamics in the Digital Era* (pp. 383–408). Doi: https://doi.org/10.4018/978-1-5225-8933-4.ch018

Bader, V., & Kaiser, S. (2017). Autonomy and Control? How heterogeneous sociomaterial assemblages explain paradoxical rationalities in the digital workplace. *Management Revu*, *28*(3), 338–358. Doi: https://doi.org/10.5771/0935-9915-2017-3-338

Berg, O., & Gustafsson, H. (2018). *Digital Workplace Strategy & Design: A step-by-step guide to an empowering employee experience*. Gr8 Mountains AB.

Blegind Jensen, T., & Stein, M.-K. (2021). Designing a digital workplace: introducing complementary smart work elements. *Journal of Financial Transformation*, *52*, 42–53.

Brahma, M., Tripathi, S. S., & Sahay, A. (2021). Developing curriculum for industry 4.0: digital workplaces. *Higher Education, Skills and Work-Based Learning*, *11*(1), 144–163. Doi: https://doi.org/10.1108/HESWBL-08-2019-0103

Colbert, A., Yee, N., & George, G. (2016). The Digital workforce and the workplace of the future. *Academy of Management Journal*, *59*(3), 731–739. Doi: https://doi.org/10.5465/amj.2016.4003

Corbin-Herbison, C. (2019). *Pros and cons of digital workplace – striking a human balance*. Retrieved from https://www.interactsoftware.com/blog/pros-cons-digital-workplace/

de Lucas Ancillo, A., del Val Núñez, M. T., & Gavrila, S. G. (2020). Workplace change within the COVID-19 context: a grounded theory approach. *Economic Research-Ekonomska istraživanja*, 1–20. Doi: https://doi.org/10.1080/1331677X.2020.1862689

Deloitte. (2020). *Tech Trends 2021*. Retrieved from https://www2.deloitte.com/content/dam/insights/articles/6730_TT-Landing-page/DI_2021-Tech-Trends.pdf

DeSoto, C. (2021). *Hybrid model advantages and disadvantages you shouldn't ignore*. Retrieved from https://thedigitalworkplace.com/articles/hybrid-model-advantages-and-disadvantages/

Europese Commissie. (2017). *Digital Workplace Strategy*. Retrieved from https://ec.europa.eu/info/sites/default/files/digitalworkplacestrategy2017.pdf

Evans-Greenwood, P., Stockdale, R., & Patston, T. (2021). *The digital-ready workplace*. Retrieved from https://www2.deloitte.com/us/en/insights/focus/technology-and-the-future-of-work/supercharging-teams-in-the-digital-workplace.html

Erceg, V., & Zoranović, T. (2020). Required competencies for successful digital transformation. *Ekonomika, 66*(3), 47–54. https://doi.org/10.5937/ekonomika2003047E

Gerten, E., Beckmann, M., & Bellmann, L. (2019). Controlling working crowds: the impact of digitalization on worker autonomy and monitoring across hierarchical levels. *Jahrbücher für Nationalökonomie und Statistik*, *239*(3), 441–481. Doi: https://doi.org/10.1515/jbnst-2017-0154

Haddud, A., & McAllen, D. (2018). Digital workplace management: exploring aspects related to culture, innovation, and leadership. *2018 Portland International Conference on Management of Engineering and Technology (PICMET)*, 1–6. Doi: https://doi.org/10.23919/PICMET.2018.8481807

Hamburg, I. (2020). Implementation of a digital workplace strategy to drive behaviour change and improve competencies. In *Strategy and Behaviours in the Digital Economy*. IntechOpen. Doi: https://doi.org/10.5772/intechopen.85135

Hicks, M. (2019). Why the urgency of digital transformation is hurting the digital workplace. *Strategic HR Review*, *18*(1), 34–35. Doi: https://doi.org/10.1108/SHR-02-2019-153

Kalischko, T., & Riedl, R. (2021). Electronic performance monitoring in the digital workplace: conceptualization, review of effects and moderators, and future research opportunities. *Frontiers in Psychology*, *12*. Doi: https://doi.org/10.3389/fpsyg.2021.633031

Kissmer, T., Knoll, J., Stieglitz, S., & Groß, R. (2018). Knowledge workers' expectations towards a digital workplace. *Conference: Americas Conference on Information Systems 2018*. Retrieved from https://aisel.aisnet.org/amcis2018/OrgTrasfm/Presentations/8/

Lagus, M. (2020). *Implementation of a digital workplace from the perspective of employees (Master's Thesis)* [ARCADA]. Retrieved from https://www.theseus.fi/bitstream/handle/10024/337949/Martin Lagus.pdf?sequence=2&isAllowed=y

Lestarini, D., Raflesia, S. P., & Surendro, K. (2015). A conceptual framework of engaged digital workplace diffusion. *2015 9th International Conference on Telecommunication Systems Services and Applications (TSSA)*, 1–5. Doi: https://doi.org/10.1109/TSSA.2015.7440431

Mann, J. (2019). *A Digital Workplace Is Crucial to Digital Transformation*. Retrieved from https://emtemp.gcom.cloud/ngw/globalassets/en/doc/documents/3909082-a-digital-workplace-is-crucial-to-digital-transformation.pdf

Md Dahlan, M. K., Abdullah, N., & Suhaimi, A. I. H. (2018). A Study on supporting factors of digital workplace diffusion in public sector. In N. Abdullah, W. Wan Adnan, & M. Foth (Eds.), *User Science and Engineering. i-USEr 2018. Communications in Computer and Information Science, vol 886.* (pp. 327–335). Doi: https://doi.org/10.1007/978-981-13-1628-9_29

Meske, C. (2019). Digital Workplace transformation – on the role of self-determination in the context of transforming work environments. *Proceedings of the 27th European Conference on Information Systems (ECIS)*. Retrieved from https://aisel.aisnet.org/ecis2019_rp/44/

Meske, C., & Junglas, I. (2020). Investigating the elicitation of employees' support towards digital workplace transformation. *Behaviour & Information Technology*, 1–17. Doi: https://doi.org/10.1080/0144929X.2020.1742382

Moore, S. (2020). *Digital Workplace Trends You Can't Ignore*. Retrieved from https://www.gartner.com/smarterwithgartner/digital-workplace-trends-you-cant-ignore/

Samek Lodovici, M., Ferrari, E., Paladino, E., Pesce, F., Frecassetti, P., Aram, E., & Hadjivassiliou, K. (2021). *The impact of teleworking and digital work on workers and society*. Retrieved from https://www.europarl.europa.eu/RegData/etudes/STUD/2021/662904/IPOL_STU(2021)662904_EN.pdf

Schmidt, C., Praeg, C., & Gunther, J. (2018). Designing digital workplace environments and agile framework for large-scale end-user participation. *International ICE Conference on Engineering Technology and Innovation*.

Shivakumar, S. K. (2020). *Build a Next-Generation Digital Workplace*. Apress. Doi: https://doi.org/10.1007/978-1-4842-5512-4

Simpler Media Group. (2019). *The State of the Digital Workplace*. Retrieved from https://www2.simplermedia.com/rs/706-YIA-261/images/2019-state-of-dw-report.pdf

Simpler Media Group. (2020). *The State of the Digital Workplace*. Retrieved from https://www2.simplermedia.com/rs/706-YIA-261/images/2020-Q3-state-of-dw-report.pdf

Vallo Hult, H., & Byström, K. (2021). Challenges to learning and leading the digital workplace. *Studies in Continuing Education*, 1–15. Doi: https://doi.org/10.1080/0158037X.2021.1879038

Williams, S. P., & Schubert, P. (2018). Designs for the Digital Workplace. *Procedia Computer Science*, *138*, 478–485. Doi: https://doi.org/10.1016/j.procs.2018.10.066

Zrinscak, S., Perl, A., & Robra-Bissantz, S. (2017). Future digital workplace - developing a tool for the hardware selection of knowledge workers. *Twenty-Third Americas Conference on Information Systems*. https://aisel.aisnet.org/amcis2017/OrganizationalIS/Presentations/18/

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Analysis of the impact of ownership characteristics on the capital structure and business success of companies in the Balkan beverage industry

Анализа утицаја карактеристика власништва на структуру капитала и пословни успех привредних друштава у индустрији пића Балкана

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Abstract: The aim of the research is to present the influence of ownership characteristics on the capital structure and business success of companies theoretically and empirically. The research was conducted on a sample of 96 active companies operating within the beverage industry in the Balkan countries in 2019. Empirical research was carried out by using one-factor analysis of variance (ANOVA). The paper presents two models. One is related to the analysis of the effects of foreign ownership to profitability, liquidity, asset and capital structure, while the other model analyses the impact of ownership concentration on the same variables. The results of the models evaluation confirmed the existence of a statistically significant difference only between foreign ownership and liquidity. In this regard, the ownership characteristics are considered not to affect the business success of the sampled companies, but rather, the performance is affected by other internal and external factors.

Keywords: foreign ownership, ownership concentration, capital structure, business success, beverage industry, Balkan
JEL classification: G32, L66

Сажетак: Циљ истраживања јесте теоријско и емпиријско приказивање утицаја карактеристика власништва на структуру капитала и пословни успех компанија. Истраживање је спроведено на узорку од 96 активних привредних друштава која су пословала у оквиру индустрије производње пића у земљама Балкана у 2019. години. Емпиријско истраживање је спроведено употребом једнофакторске анализе варијансе (АНОВА). У раду су представљена два модела, при чему се један везује за анализу ефеката страног власништва, док је у другом моделу анализиран утицај концентрације власништва на исте варијабле, односно на профитабилност, ликвидност, структуру капитала и структуру средстава. Резултати оцене модела потврдили су постојање статистички значајне разлике једино између страног власништва и ликвидности. У вези са тим, сматра се да карактеристике власништва нису од утицаја на пословни успех компанија из узорка, већ да су перформансе условљене другим интерним и екстерним факторима.

Кључне речи: страно власништво, концентрација власништва, структура капитала, пословни успех, индустрија пића, Балкан
ЈЕЛ класификација: Г32, Л66

Introduction

One of the characteristics of foreign ownership is usual physical distance between the real owner and the management of the company, resulting in an increase in the freedom and flexibility of managers to make decisions according to their interest. This is in contrast to the concentrated ownership structure that was predominantly represented in business life a few decades ago, where there was a patriarchal management structure – often relying on family which maintained control over the company's operations. It is believed that the moment of reversal occurred at a time when the method of production required technologically intensive equipment. Due to lack of funds, there was a need to expand ownership, in the form of recapitalization. Growing business complexity, rapid market requirements, state-of-the-art technological innovations and global coherency require prompt response and flexibility of companies' management structures (Ančić, Ančić & Miletić, 2020, p. 37). Agency theory refers to the creation of agency costs in organizations during the separation of ownership and management functions, and especially when managers make decisions as so-called "agents" of smaller shareholders, which are not in line with the interests of owners.

Such structures have shown over time that the existence of a separation between shareholders and managers affects the creation of agency problems, due to the efforts of managers to increase their benefits, often to the detriment of shareholders or owners. In aforesaid situations, the agency problem arises when management acts on behalf of a group of shareholders, but not on behalf of all. According to Agency theory, as Gillan & Starks (2003, p. 14) believe, ownership concentration leads to reduced agency conflict between owner and management.

The subject of the research conducted in this paper is the assessment of the effects of ownership characteristics on the capital structure, as well as on business success indicators in the form of profitability, liquidity and asset structure.

The aim of the research is to theoretically and empirically present the influence of ownership characteristics factors on the performance of companies operating within the beverage production industry in the Balkan countries in 2019.

The paper is presented in three sections. The first unit of the paper provides an overview of research results and conclusions of other authors in the latest literature on this topic. The second section of the paper explains the composition of the sample, the source of data, an overview of the variables used, as well as applied methodology. The third segment presents the results of the models evaluation, their explanation and conclusions.

1. Theoretical background

One of the characteristics of capital is its ownership. As such, ownership, and its impact on the ratio of own and borrowed resources, as well as on other company performance, is the subject of many studies.

1.1. Foreign ownership

In a global environment, there has been a marked increase in the participation of foreign investors in the ownership structures of companies in the Balkan countries. Bentivogli & Mirenda (2017, p. 16) believe that "this phenomenon has raised concerns about the risk of holding a significant portion of the national production system in foreign hands that may not take into account the company's long-term prospects". Also, at the beginning of the 21st century, foreign investment was considered a safe formula for good company performance, until the beginning of the global economic crisis, when Western foreign companies were the first to feel the economic shock and transfer it directly to domestic markets by participating in domestic capital. When it comes to foreign participants in company ownership, institutional investors are increasingly present in the markets of developing countries. Doğan (2020, p. 59) concluded that there exists a positive relationship between institutional investors and the firm value, adding that institutional investors are more interested in a firm with high performance.

1.2. Ownership concentration

Concentration of ownership could be way to limit the agency problem between managers and shareholders, which would lead to improved business success of companies. According to Hu & Izumida (2008, p. 73), this positive effect of ownership concentration is caused by more efficient monitoring, given that large shareholders have greater power and incentive to oversee the management of the company. However, the problem is in the fact that the shareholders bear the costs caused by the increased monitoring of the management, while on the other hand, the benefits are granted according to equity participation. For this reason, large shareholders will feel the benefits of monitoring, while for smaller shareholders the costs will outweigh the benefits (Ozkan & Ozkan, 2004, p. 2112).

Also, there is a widespread view that forms of effective corporate governance, such as the presence of a small number of owners, are often signals to their potential lenders of quality company management. It is for this reason that concentrated ownership often provides easier access to capital markets and a greater orientation of the capital structure towards borrowed resources.

Ownership concentration as another characteristic of ownership and an independent variable will be presented in this paper as a percentage share of the largest owner in the company's equity.

1.3. Capital structure

Many authors who developed theories on capital structure spoke about various factors that lead to optimization of debt-to-equity ratio. There are views in the literature on the negative impact of foreign ownership on the capital structure. The general observation is the possibility that foreign companies could be financed from several available sources of financing that can replace debts to financial institutions. Also, foreign investors generally

have enviable management skills, valuable technology and reputation, which allows low interest rates even when borrowing funds. In this regard, Li, Yue & Zhao (2009, p. 478) analysed the companies from China, with a survey conducted in the period from 2000 to 2004, and found the presence of a negative and statistically significant relationship between foreign ownership and capital structure , including the delineation of debts into long-term and short-term. As the main reason for such an impact, the authors point to (2009, p. 472) lower corporate income tax rates for foreign investors, which further motivates them to use their own sources of financing, considering that they will not achieve large tax savings by additional borrowing, as domestic companies. Also, Grupta et al. (2020, p. 13) found the presence of a negative and statistically significant relationship between foreign ownership and capital structure by analysing 200 companies listed on the leading stock exchange in India in the period from 2007 to 2018. Thai (2017, p. 30), who conducted the research on a sample of 261 companies listed on the Vietnam Stock Exchange in the period from 2007 to 2014, also agreed with such conclusions,

In contrast, Szewc-Rogalska & Wąsacz (2020, p. 50) argue that “foreign companies finance their business with debt, both short-term and long-term, to a greater extent than domestic companies”, believing that there is a positive link between foreign participation ownership and capital structures. On the other hand, there is a group of authors like Zou & Xiao (2006, p. 253) and Sivathaasan (2013, p. 40) who believe that foreign ownership is not a significant determinant of capital structure.

Regarding the concentration of ownership, it is considered to be a precondition for stronger supervisory power. Owners with a significant share in the company's capital can take significant management actions. "As such, ownership concentration could be an internal management mechanism that helps reducing the likelihood of managerial opportunism (Lean, Ting & Kweh, 2015, p. 118)."

Lean, Ting & Kweh (2015) conducted a study on a sample of 201 companies from Malaysia that operated for a period of ten years, where the subject of analysis, in addition to the impact of concentration of ownership on capital structure, is the impact of family ownership as a form of concentrated ownership. The authors concluded that the nature of the influence of the mentioned variables is such that the higher the concentration of ownership, the more the capital structure is oriented towards own sources (p. 130). Also, the same research found that the negative effect is smaller in family-owned companies than in other companies (p. 130). Further, Mbanyele (2020) conducted a similar study on a sample of 163 companies operating in Italy between 2002 and 2013. The study showed that there is a non-linear relationship between ownership concentration and the financial mix, i.e. that the company's capital structure is more debt-oriented at low levels of ownership concentration and reduces debt financing as ownership concentration increases. (p. 15).

Santos, Moreira & Vieira (2013) analysed the relationship between ownership concentration and capital structure, using a sample of 694 companies from Western Europe between 2002 and 2006. The authors interpreted such negative relationship as the result of the role of ownership structure as a mechanism of corporate governance, their increased risk aversion resulting from poorly diversified investment portfolio, the fact that debt

imposes restrictions on dominant owners and the fact that their presence increases the company's capital potential (p. 1101). In addition, Farooq (2015) presented the same conclusion. An analysis of companies from the Middle East and North Africa that were active in the period from 2005 to 2009, concluded that there is a negative impact of ownership concentration and capital structure (p. 111).

The indicator of the capital structure that will be used in the analysis presented in the paper is the ratio of total debt and total capital, while the total debt will be formed as the sum of long-term and short-term debts.

1.4. Asset structure

As a condition for survival in modern markets, companies regularly invest in the acquisition of new technology and use them to gain yield. Therefore, the impact of company ownership on asset structure has often been analysed in the literature and in practice.

Vishwasrao & Bosshardt (2001, p. 385) concluded that large companies along with foreign companies are investing more in new technology. Also, it is considered that companies with concentrated ownership, invest more in fixed assets. The most common reason is the long-term goal of investors with a large share in the capital. Masset & Weisskopf (2016) agree with aforesaid by researching a sample of American and Western European countries in the period from 2004 to 2013 (p. 21).

Using the 2,000 largest U.S. companies whose shares were publicly traded between 2003 and 2007 Anderson, Duru & Reeb (2012) investigated the impact of family shareholders on corporate investment policy. The analysis showed that family ownership has a strong connection with the policy of increased investments, as well as that companies with family ownership invest less financial resources than non-family companies. In addition, they note that when long-term investments in research, development and capital expenditures are separated, family firms allocate larger financial resources to capital investments than non-family firms (p. 1746).

The indicator of the asset structure variable that has been widely used is in the form of the quotient of the book value of fixed assets and total assets.

1.5. Liquidity

There are known views in the literature regarding the impact of ownership characteristics on the ability of companies to meet their obligations at maturity. Szewc-Rogalska & Wąsacz (2020, p. 50) conclude "that foreign companies apply a more aggressive financial liquidity management strategy than domestic companies". Furthermore, the positive impact of foreign ownership on liquidity was also seen by Mangena and Tauringana (2007, p. 78). Such conclusions were confirmed by Ozkan & Ozkan (2004, p. 2129) in a survey of companies in the UK, stating that the ownership structure significantly affects the amount of cash of companies. On the other hand, the author Al-Harbi (2017, p. 170) concluded on

the example of 686 banks from developing countries that foreign ownership negatively affects the liquidity of banks.

In addition, Chalermchatvichien, Jumreornvong, Jiraporn & Singh analysed the impact of bank ownership structure as a governance mechanism on capital adequacy and liquidity in Asian banks. The results showed that with increasing concentration of ownership, banks become better capitalized and more liquid (2013, p. 236). On the other hand, Alelfartas (2019) conducted a study using data collected from the annual reports of 13 Jordanian commercial banks for the period from 2009 to 2016, concluding that the concentration of ownership does not have a statistically significant impact on liquidity risk (p. 31).

In further analysis in the paper, the liquidity variable will be presented by the current ratio, in the form of quotients of short-term assets and short-term liabilities.

1.6. Profitability

According to the research of Pavlović & Čelić (2020, p. 108) on the sample of SMEs from Serbia, in order to succeed in the strategic process of development, it is necessary for every company to include performance evaluation activities in their strategy. When analysing the profitability of corporations, it is extremely important to consider the impact of company ownership characteristics on profitability. Al-Thuneibat (2018, p. 16) believes that there is a statistically significant and negative impact of the foreign capital-oriented ownership structure on profitability, while on the other hand Douma, George & Kabir (2006, p. 652) analysed 1005 companies from India that are listed on the Bombay Stock Exchange from 1999 to 2000, concluding that foreign corporate ownership has a positive and significant effect on the profitability of companies. Also, Nofal (2020) established the existence of a positive and statistically significant impact of foreign corporate ownership on the profitability of domestic companies in a sample of 66 non-financial companies listed in the period from 2014 to 2018 (p. 241).

It is necessary to point out that some authors such as Gurbuz & Aybars (2010, p. 358) believe that, in general, foreign ownership improves the company's performance to a certain level, after which, increasing the share of foreign versus domestic ownership no longer affects profitability. Yavas & Erdogan (2016, p. 369) share a similar view, believing that the participation of foreign ownership brings various benefits and improvements in company performance, while after a certain percentage of foreign investors' participation in total capital, companies suffer some negative effects, confirming the existence of non-linear relationship between foreign ownership and profitability. Barbosa & Louri (2005, p. 2) add that foreign ownership brings financial, marketing, technological and managerial benefits which helps companies to improve their financial performance, however, excessive participation of foreign ownership in capital can worsen financial performance, as the companies will thus alienate from local consumers as well as the local manner of doing business.

Additionally, Bentivogli & Mirenda (2017, p. 16) concluded that foreign acquisitions in one country cannot lead to a deterioration in company performance, but

believe that the performance of domestic companies improves after foreign ownership investments, while Hu & Izumida (2008) concluded that it is difficult to establish a link between foreign ownership and company profitability due to a wide range of determinants that are influenced by such political, cultural, environmental and economic factors (p. 75).

The concentration of ownership as another characteristic of ownership presented in the paper proved to be a factor with different impact on the profitability of the company. The research was conducted by Singal & Singal (2011) on a sample of 4,384 companies operating in India in the period from 2001 to 2009. The authors investigated the difference in the impact of concentrated and dispersive ownership on company performance, as well as the difference between the impact of other types of concentrated ownership, such as family ownership, state ownership, and ownership of subsidiaries of foreign multinational companies. The results showed that companies with concentrated ownership are associated with higher company performance. (p. 393). Also, a positive relationship between ownership concentration and performance was noted by Nguyen, Locke & Reddy (2015) on a sample of Asian companies operating in the period from 2008 to 2011. The research investigates the relationship between ownership concentration and financial performance of companies in Singapore and Vietnam, distinguishing two different types of national management systems – well-developed versus underdeveloped – noting that the positive effect of concentrated ownership on the performance of companies operating in an underdeveloped national management system, like Vietnam, tends to be stronger than in a well-established system, such as Singapore, confirming the argument that concentration of ownership is an effective corporate governance mechanism that can replace the poor quality of national governance (p. 148). That concentrated ownership affects company performance positively was also noted by Huang (2020, p. 3), who focused exclusively on banks to avoid industry- and country-specific factors that could lead to different conclusions. The results of the analysis of Abbas, Naqvi & Mirza (2013) show the existence of a significant positive effect of concentrated ownership on the performance of the company, in the case when the owners have at least 10% share in the company's capital. However, the results suggest that a concentration of ownership above the 50% level has a negative impact on firm performance (p. 1150).

On the other hand, Svejnar & Kocenda (2002, p. 30) consider that companies with dispersed ownership have a greater positive effect on profits than companies with more concentrated ownership, while Wahla, Shah & Hussain (2012, p. 12), along with Al-Thuneibat (2018, p. 16) consider that the concentration of ownership does not affect profitability.

Further analysis in the paper will deal with the impact of ownership characteristics on profitability, representing profitability through the ROA indicator.

After defining the problem and aim of the research, as well as reviewing the results of research by other authors in the field of the impact of foreign ownership and ownership concentration on capital structure and business success of companies, the hypotheses to be tested are as follows:

H1: There is a statistically significant difference between foreign ownership and the capital structure of companies within the Balkan beverage industry.

H2: There is a statistically significant difference between foreign ownership and the asset structure of companies within the Balkan beverage industry.

H3: There is a statistically significant difference between foreign ownership and liquidity of companies within the Balkan beverage industry.

H4: There is a statistically significant difference between foreign ownership and the profitability of companies within the Balkan beverage industry.

H5: There is a statistically significant difference between the concentration of ownership and the capital structure of companies within the Balkan beverage industry.

H6: There is a statistically significant difference between the concentration of ownership and the asset structure of companies within the Balkan beverage industry.

H7: There is a statistically significant difference between the concentration of ownership and the liquidity of companies within the Balkan beverage industry.

H8: There is a statistically significant difference between the concentration of ownership and the profitability of companies within the Balkan beverage industry.

2. Data source and methodology

The source of data on the companies used for the purposes of the analysis is the TP Catalyst, Bureau van Dijk database. Companies with activity codes within sector C - Manufacturing, area 11 - Manufacture of beverages, according to the Regulation on the classification of activities (2010), were searched. The sample includes 96 active companies with the highest amount of operating income in 2019 within the Balkan beverage industry. The sampled companies belong to different groups within the beverage industry and have headquarters in different Balkan countries, as shown in the tables below.

Table 1: Overview of number of companies by activity group number

Group number	Group name	Number of companies
11.10	Distilling, rectifying, and blending of spirits	17
11.20	Manufacture of wine from grapes	40
11.50	Manufacture of beer	14
11.60	Manufacture of malt	1
11.70	Manufacture of soft drinks; production of mineral waters and other bottled waters	24
Total		96

Source: the author's research

Table 2: Overview of companies by country of headquarters

Country of companies' headquarters	Number of companies
Albania	0
Bosnia and Herzegovina	3
Bulgaria	28
Montenegro	0
Greece	33
Croatia	3
North Macedonia	0
Romania	24
Slovenia	1
Serbia	4
Total	96

Source: the author's research

The choice of dependent and independent determinants that are the subject of analysis relies on a review of variables used in the previous literature in the field of research subjects. The following table shows the variables used in evaluating the models in this paper, together with the source literature.

Table 3: Overview of variable types, names, formulation and literature source of variables

Variable type	Variable name	Formulation	Literature source
Independent variables	Foreign ownership	Share of foreign ownership in total ownership	Douma, George & Kabir (2006), Zou and Xiao (2006), Mangena & Tauringana (2007), Li, Yue & Zhao (2009), Gurbuz & Aybars (2010), Makoto & Pascal (2013). Sivathaasan (2013), Szewc-Rogalska & Wąsacz (2020), Al-Thuneibat (2018), Alelfartas (2019), Gupta, Yadav & Jain (2020), Nofal (2020)
	Ownership concentration	Percentage share owned by the largest owner	Santos, Moreira & Vieira (2013), Chalermchatvichien, Jumreornvong, Jiraporn & Singh (2013), Al-Thuneibat (2018), Alelfartas (2019), Rao, Khursheed, & Mustafa (2020)
Dependent variables	Capital structure	Total debt / Capital	Farooq (2015), Lean, Ting & Kweh (2015), Gupta, Yadav & Jain (2020), Szewc-Rogalska & Wąsacz (2020)
	Asset Structure	Fixed assets / Total assets	Gurbuz & Aybars (2010), Makoto & Pascal (2013), Masset & Weisskopf (2016), Moradi & Paulet (2018), Gupta, Yadav & Jain (2020)

	Liquidity	Current assets / Current liabilities	Gurbuz & Aybars (2010), Chalermchatvichien, Jumreornvong, Jiraporn & Singh (2013), Alelfartas (2019), Szewc-Rogalska & Wąsacz (2020)
	Profitability	ROA	Gurbuz & Aybars (2010), Singal & Singal (2011), Makoto & Pascal (2013), Lean, Ting & Kweh (2015), Moradi & Paulet (2018), Al-Thuneibat (2018), Masset, Uzelac & Weisskopf (2019), Gupta, Yadav & Jain (2020), Huang (2020), Nofal (2020), Rao, Khursheed, & Mustafa (2020)

Source: the author's research

Final conclusions on the impact of the ownership structure will be made on the basis of one-factor variance analysis, i.e. on the basis of the results of the ANOVA test.

3. Research results with discussion

The research conducted in this paper will be presented through two models, which will primarily differ in the type of independent variable. Model 1 will include testing the impact of foreign ownership on capital structure, profitability, liquidity and asset structure, while Model 2 will cover the effect of ownership concentration on capital structure as well as business success, presented through variables of profitability, liquidity and asset structure. An integral part of the analysis of variance is the identification of descriptive statistics. Following table presents the descriptive statistics of model 1 according to the groups of the percentage share of foreign ownership in capital.

Table 4: Overview of descriptive statistics of model 1and 2

		Foreign ownership					Ownership concentration				
		N	Mean	Std. Dev.	Min	Max	N	Mean	Std. Dev.	Min	Max
Profitability	1	8	0.108	0.088	0.012	0.224	9	0.090	0.078	0.001	0.224
	0,9999-0,7500	11	0.079	0.086	0.001	0.257	27	0.093	0.104	0.002	0.445
	0,7499-0,5000	3	0.044	0.039	0.001	0.076	29	0.055	0.053	0.001	0.167
	0,4999-0	74	0.067	0.074	0.001	0.445	31	0.063	0.061	0.001	0.203
	Total	96	0.071	0.076	0.001	0.445	96	0.071	0.076	0.001	0.445
Liquidity	1	8	1.747	1.259	0.305	3.845	9	2.688	1.130	0.890	4.511
	0,9999-0,7500	11	0.880	0.456	0.310	1.808	27	1.767	1.147	0.310	4.479
	0,7499-0,5000	3	1.842	0.367	1.422	2.102	29	1.796	0.965	0.263	4.297

	0,4999-0	74	2.094	1.233	0.263	7.566	31	1.940	1.438	0.314	7.566
	Total	96	1.918	1.209	0.263	7.566	96	1.918	1.209	0.263	7.566
Asset Structure	1	8	0.540	0.250	0.037	0.835	9	0.441	0.156	0.181	0.657
	0,9999-0,7500	11	0.605	0.220	0.160	0.844	27	0.542	0.207	0.150	0.844
	0,7499-0,5000	3	0.522	0.217	0.385	0.772	29	0.467	0.238	0.037	0.842
	0,4999-0	74	0.481	0.192	0.048	0.842	31	0.515	0.169	0.251	0.834
	Total	96	0.501	0.202	0.037	0.844	96	0.501	0.202	0.037	0.844
Capital structure	1	8	0.623	1.625	0.000	4.635	9	0.668	1.757	0.000	5.338
	0,9999-0,7500	11	1.186	2.417	0.000	7.939	27	0.299	0.540	0.000	2.668
	0,7499-0,5000	3	0.465	0.323	0.230	0.834	29	0.771	1.039	0.000	4.635
	0,4999-0	74	0.552	0.795	0.000	5.338	31	0.768	1.420	0.000	7.939
	Total	96	0.628	1.157	0.000	7.940	96	0.628	1.157	0.000	7.939

Source: the author's research

The results of descriptive statistics of Model 1 show that companies are profitable on average, regardless of the percentage of share of foreign ownership in capital. According to the average values, it is considered that the most profitable companies in the sample are companies with 100% foreign capital. Also, companies in the Balkan beverage industry in 2019 are liquid, except for companies that belong to the range of participation of foreign ownership in capital in the range of 75% to 99.99%. Additionally, a balanced relationship in the structure of assets between fixed and current assets is noticeable, while the capital structure of companies with a high share of foreign investment is turned more towards borrowed sources, unlike with predominantly domestic ownership. Regarding Model 2, which includes the impact of ownership concentration on dependent variables, it can be concluded that the results do not differ much from the results of model 1. It should be noted that on average companies are more profitable with higher concentration ownership. In addition, the companies in the sample are most liquid when the capital is owned by only one owner. Further, the analysis of Model 1 will be further presented with the Levene test of homogeneity of variance, which is shown below.

Table 5: Overview of the model 1 homogeneity test

	Levene statistic	df1	df2	Sig.
Profitability	1.003	3	92	0.395
Liquidity	2.804	3	92	0.044
Asset structure	0.184	3	92	0.907
Capital structure	6.230	3	92	0.001

Source: the author's research

According to the results of the Levene test, the significance value does not exceed 5% in the case of measuring the effect of foreign ownership on liquidity and capital structure. Therefore, the assumption of homogeneity of variance is considered to be violated. Accordingly, for the mentioned variables, conclusions should be made on the basis of the Welch test, which is resistant to the violation of the equality of variance in the results of all groups of foreign ownership. Regarding profitability and asset structure, it is necessary to draw conclusions based on the interpretation of ANOVA results.

Since the estimated value of the significance of the impact of foreign ownership on profitability and asset structure is higher than the significance threshold of 5%, it is considered that the impact is not statistically significant and there are no significant differences. Therefore, hypothesis H2 and H4 are rejected. Although contrary to expectations, foreign ownership does not have a significant impact on the profitability of Balkan companies. However, such a result is in line with Hu and Izumida (2008, p. 75), who concluded that it is difficult to establish a relationship between foreign ownership and profitability of firms due to a wide range of political, cultural, environmental and economic factors. Further, using the results of the Welsh test, liquidity and capital structure indicators will be considered.

Table 6: Overview of model 1 Welch test results

		Statistic[a]	df1	df2	Sig.
Liquidity	Welch	11.794	3	9.723	0.001
Capital structure	Welch	0.284	3	8.879	0.836

Source: the author's research

Following the results of the Welch test of Model 1, the statistically significant impact of foreign ownership on the liquidity of companies in the Balkan beverage industry in 2019 could be confirmed. In this regard, hypothesis H3 is accepted. This result is consistent with the conclusions of Szewc-Rogalska and Wąsacz, Mangenes and Tauringans, as well as with Ozkan and Ozkan, who consider that companies with major foreign ownership tend to apply a more aggressive financial liquidity management strategy than companies with dominant domestic ownership.

Also, it proves necessary to point out the non-existence of a significant impact of foreign investments on the capital structure, which rejects hypothesis H1. Although the participation of foreign entities in capital structure could bring great opportunities such as recapitalization, introduction of modern technology, expansion of new markets and financing opportunities, research results show that such benefits do not affect the company's decision on capital structure. The lack of influence of foreign ownership on the capital structure is in line with the results of authors such as Zou, Xiao and Sivathaasan.

Regarding Model 2, it includes the impact of ownership concentration on dependent variables. In the following table, the Leven test results will be presented.

Table 7: Overview of the model 2 homogeneity test

	Levene statistic	df1	df2	Sig.
Profitability	3.200	3	92	0.027
Liquidity	0.711	3	92	0.548
Asset structure	1.662	3	92	0.181
Capital structure	1.568	3	92	0.202

Source: the author's research

The Leven test results show a significance value of less than 5% only for the Profitability indicator; therefore, the impact of foreign ownership on company performance will be assessed based on a robust Welch test, while models involving liquidity variables, asset structure and capital structure will be evaluated using results ANOVA test.

Since the ANOVA results show that significance value of the impact of ownership concentration on liquidity, asset structure and capital structure exceeds the significance threshold of 5% within the presented results of analysis of variance, it is considered that there is no statistically significant relationship and impact between ownership concentration and liquidity, capital structure and asset structure. Finally, hypotheses H5, H6, and H7 are rejected. Although in theory it is assumed that the ownership concentration allows easier access to borrowed sources of financing in the capital market (Sivathaasan, 2013, p. 35), the results show that the ownership concentration does not affect the capital structure of companies in the Balkan countries. Considering that the Balkan has not reached the level of development of the capital market as a developed western countries, results of the research conducted in this paper has proven that aforementioned rule cannot be applied to developing countries, i.e. transition countries such as most Balkan countries.

The final conclusions about the effects of ownership concentration on the profitability of the sampled companies will be based on the results of the robust Welch test, which is presented in the table below.

Table 8: Overview of model 2 Welch test results

		Statistic[a]	df1	df2	Sig.
Profitability	Welch	1.262	3	30.620	0.305

Source: the author's research

The result of the Welch test shows the absence of a statistically significant effect of the concentration of ownership on the profitability of companies from the Balkan beverage industry in 2019. Finally, Hypothesis H8 is rejected. The result is consistent with the outcome of authors such as Wahla, Shah and Hussain (2012), as well as Al-Thuneibat (2018), which confirms the insignificance of the ownership concentration in solving potential agency problems in companies from the sample.

Conclusion

The results of the research showed that out of all analysed relationships, the only statistically significant influence is the impact of foreign ownership on the liquidity of companies in the Balkan beverage industry in 2019, while the effect of ownership characteristics on other indicators of capital structure and business success did not prove statistically significant. In this regard, hypothesis H3 is accepted, while other hypotheses set out in the paper are rejected. Taking into account the final results of the research, it can be established that the ownership characteristics of companies are not crucial for good company performance, but they are conditioned by other factors, except liquidity, for which dependence on foreign ownership has been established.

One of the reasons for the lack of statistical significance of the impact of foreign ownership lies in the fact that foreign owners often only strive to diversify their investments, so they often focus on short-term efficiency, and therefore the impact of their existence on capital structure and business success is limited. Such phenomena are characteristic of unstable and underdeveloped stock exchanges, when the participation of foreign companies in capital of domestic companies is an extremely small part of their overall investments.

One of the limitations of research on the impact of foreign ownership on capital structure and business success relates to the form of foreign investment. According to Anwar & Sun (2015, p. 2), a foreign investment can be in the form of a loan or in the form of capital, leading to a vaguely defined impact of a non-resident legal entity on the capital structure of a resident company. Also, the results of the research may vary depending on the country of operation of the companies in the Balkans. In this regard, it is possible to draw a general conclusion, and it proves necessary to conduct research for individual countries, after which the results will be interpreted within the circumstances that are specific to a particular country.

In addition, during the next research of the capital structure and business success, it is necessary to find determinants that significantly affect the formation of the financial structure and indicators such as liquidity, profitability and asset structure.

The results of the analysis conducted in this paper are mostly useful for policy makers who are affected by foreign investment in the capital of domestic companies. First of all, the research presents an analytical review of the effect of the ownership structure in terms of foreign capital participation and ownership concentration on the main characteristics of companies in the beverage industry of the Balkan countries. The Balkan countries are an interesting area of research due to the countries that are mostly developing, with a good climate, geopolitical position, infrastructure and source of resources, which favourably influences the attraction of foreign investments. In addition, research findings may suggest to legislators the consequences of foreign investment such as increased liquidity of domestic companies.

References

Abbas, A., Naqvi H., A., & Mirza, H., H. (2013). Impact of large ownership on firm performance: a case of non-financial listed companies of Pakistan. *World Applied Sciences Journal*, 21 (8), 1141-1152, Doi: https://doi.org/10.5829/idosi.wasj.2013.21.8.1916

Al-Harbi, A. (2017). Determinants of banks liquidity: evidence from OIC countries. *Journal of Economic and Administrative Sciences*, Vol. 33, No. 2, 164-177. Doi: https://doi.org/10.1108/JEAS-02-2017-0004

Alelfartas, E. (2019). The impact of internal corporate governance mechanisms on liquidity risk at Jordanian commercial banks listed on the Amman stock exchange. *International Journal of Latest Research in Humanities and Social Science (IJLRHSS),* 02-10, 24-34. Retrieved from http://www.ijlrhss.com/paper/volume-2-issue-10/4-HSS-509.pdf

Al-Thuneibat, A. (2018). The relationship between the ownership structure, capital structure and performance. *Journal of Accounting - Business & Management,* 25(1), 1-20. Doi: https://doi.org/10.31966/jabminternational.v1i25.326

Anderson, R. C., Duru, A., & Reeb, D., M. (2012). Investment policy in family controlled firms. *Journal of Banking & Finance*, 36(6), 1744–1758. Doi: https://doi.org/10.1016/j.jbankfin.2012.01.018

Ančić, D., Ančić, J. & Miletić, V. (2020). Cost management efficiency factors of enterprises in Serbia. *Ekonomika,* 66(1), 37-51. Doi: https://doi.org/10.5937/ekonomika2001037A

Anwar, S. & Sun, S. (2015). Can the presence of foreign investment affect the capital structure of domestic firms? *Journal of Corporate Finance,* 30, 32-43. Doi: https://doi.org/10.1016/j.jcorpfin.2014.11.003

Barbosa, N. & Louri, H. (2005). Corporate performance: Does ownership matter? A comparison of foreign-and domestic-owned firms in Greece and Portugal. *Review of Industrial Organization*, 27, 73-102. Doi: https://doi.org/10.1007/s11151-005-4920-y

Bentivogli, C., & Mirenda, L. (2017). Foreign ownership and performance: evidence from Italian firms. *International Journal of the Economics of Business*. Doi: https://doi.org/10.1080/13571516.2017.1343542

Chalermchatvichien, P., Jumreornvong, S., Jiraporn, P., & Singh, M. (2013). The effect of bank ownership concentration on capital adequacy, liquidity, and capital stability. *Journal of Financial Services Research*, 45(2), 219–240. Doi: https://doi.org/10.1007/s10693-013-0160-8

Doğan, M. (2020). Institutional ownership and firm value: A study on BIST manufacturing index. *Ekonomika*, 66(4), 29-46. Doi: https://doi.org/10.15388/Ekon.2020.2.4

Douma, S., George, R., & Kabir, R. (2006). Foreign and domestic ownership, business groups, and firm performance: evidence from a large emerging market. *Strategic Management Journal*, 27(7), 637–657. Doi: https://doi.org/10.1002/smj.535

Farooq, O. (2015). Effect of ownership concentration on capital structure: evidence from the MENA region. *International Journal of Islamic and Middle Eastern Finance and Management*, 8(1), 99–113. Doi: https://doi.org/10.1108/IMEFM-10-2013-0115

Gillan, S., L., & Starks, L., T. (2003). Corporate governance, corporate ownership, and the role of institutional investors: A global perspective. *Journal of Applied Finance,* 13(2), 4-22.

Gupta, S., Yadav, S., S., & Jain, P., K. (2020). Impact of foreign ownership on leverage: a study of Indian firms. *Global Business Review,* 1-17. Doi: https://doi.org/10.1177%2F0972150920927360

Gurbuz, A., O., & Aybars, A. (2010). The impact of foreign ownership on firm performance, evidence from an emerging market: Turkey. *American Journal of Economics and Business Administration*, 2 (4), 350-359. Doi: https://doi.org/10.3844/ajebasp.2010.350.359

Hu, Y., & Izumida, S., H. (2008). The relationship between ownership and performance: a review of theory and evidence. *International Business Research,* 1(4), 72-78.

Huang, Q. (2020). Ownership concentration and bank profitability in China. *Economics Letters*, article 109525. Doi: https://doi.org/10.1016/j.econlet.2020.109525

Lean, H., H., Ting, I., W., K., & Kweh, Q., L. (2015). Ownership concentration, family ownership and leverage: evidence from Malaysia. *Malaysian Journal of Economic Studies*, 52 (2), 117-133. Retrieved from https://mjes.um.edu.my/article/view/2787/974

Li, K., Yue, H., & Zhao, L. (2009). Ownership, institutions, and capital structure: evidence from China. *Journal of Comparative Economics*, 37(3), 471–490. Doi: https://doi.org/10.1016/j.jce.2009.07.001

Makoto, N., & Pascal, N. (2013). Foreign ownership and firm performance: evidence from Japan's electronics industry, *Applied Financial Economics*, 23:1, 41-50. Doi: https://doi.org/10.1080/09603107.2012.705425

Mangena, M., & Tauringana, V. (2007). Disclosure, corporate governance and foreign share ownership on the Zimbabwe Stock Exchange. *Journal of International Financial Management and Accounting*, Vol. 18 No. 2, 53-85. Doi: https://doi.org/10.1111/j.1467-646X.2007.01008.x

Masset, P., & Weisskopf, J. (2016). Ownership structure, asset intensity and firm performance. *Proceedings of 12th Workshop on Family Firm Management Research, Bridging the Gap - Integrating Family Business Theory & Practice,* 1-39. Retrieved from https://acfr.aut.ac.nz/__data/assets/pdf_file/0004/56425/38741-JP-Weisskopf-AL_Own_Perfo.pdf

Mbanyele, W. (2020). Ownership concentration, firm life cycle, and leverage: evidence from Italian family firms, *Cogent Economics & Finance*, 8:1, article no. 1838687, pp. 1-19. Doi: https://doi.org/10.1080/23322039.2020.1838687

Moradi, A., Paulet, E. (2018), The Firm-specific Determinants of Capital Structure – An Empirical Analysis of Firms before and during the Euro Crisis, *Research in International Business and Finance*. Vol. 47, 150-161. Doi: https://doi.org/10.1016/j.ribaf.2018.07.007

Nguyen, T., Locke, S., & Reddy, K. (2015). Ownership concentration and corporate performance from a dynamic perspective: Does national governance quality matter? *International Review of Financial Analysis*, 41, 148–161. Doi: https://doi.org/10.1016/j.irfa.2015.06.005

Nofal, M. (2020). The effect of foreign ownership on firm performance: evidence from Indonesia. *Advances in Economics, Business and Management Research*, Vol. 135, 3rd Asia Pacific International Conference of Management and Business Science (AICMBS 2019), 237-242. Doi: https://dx.doi.org/10.2991/aebmr.k.200410.037

Ozkan, A., & Ozkan, N. (2004). Corporate cash holdings: An empirical investigation of UK companies. *Journal of Banking & Finance,* 28, 2103-2134. Doi: https://doi.org/10.1016/j.jbankfin.2003.08.003

Pavlović, N., & Čelić, I. (2020). The analysis of competitive strategies from the perspective of small and medium enterprises. *Menadžment u hotelijerstvu i turizmu*, 8(1), 101-110. Doi: https://doi.org/10.5937/menhottur2001101P

Rao, M., Khursheed, A., & Mustafa, F. (2020). Impact of Leverage and Ownership Concentration on the Firms' Performance: A Case of Pakistan. *LogForum,* 16 (1), 15-31. Doi: http://doi.org/10.17270/J.LOG.2020.375

Santos, M. S., Moreira, A. C., & Vieira, E. S. (2013). Ownership concentration, contestability, family firms, and capital structure. *Journal of Management & Governance*, 18(4), 1063–1107. Doi: https://doi.org/10.1007/s10997-013-9272-7

Singal, M., & Singal, V. (2011). Concentrated ownership and firm performance: does family control matter? *Strategic Entrepreneurship Journal*, 5(4), 373–396. Doi: https://doi.org/10.1002/sej.119

Sivathaasan, N. (2013). Foreign Ownership, Domestic Ownership and Capital Structure: Special reference to Manufacturing Companies Quoted on Colombo Stock Exchange in Sri Lanka. *European Journal of Business and Management.* Vol. 5, No. 20. Retrieved from https://core.ac.uk/download/pdf/234624926.pdf

Svejnar, J., & Kocenda, E. (2002). The Effects of Ownership Forms and Concentration on Firm Performance after Large-Scale Privatization. *William Davidson Institute Working Papers Series 471*, William Davidson Institute at the University of Michigan, 1-37. Doi: https://doi.org/10.2139/ssrn.314480

Szewc-Rogalska, A., & Wąsacz, M. (2020). Foreign ownership versus financial liquidity and debts of enterprises in Poland. *The Małopolska School of Economics in Tarnów Research Papers Collection,* 46(2), 43–54. Doi: http://dx.doi.org/10.25944/znmwse.2020.02.4354

Thai, A. (2017). The effect of foreign ownership on capital structure in Vietnam. *Review of Integrative Business and Economics Research*, Vol. 8, Issue 1, 20-32. Retrieved from https://www.researchgate.net/publication/327762698_The_Effect_of_Foreign_Ownership_on_Capital_Structure_in_Vietnam

Uredba o klasifikaciji delatnosti. (2010). *Official Gazette of the Republic of Serbia*, br. 54/2010.

Yavas, C., V., & Erdogan, S., B. (2016). The effect of foreign ownership on firm performance: evidence from emerging markets. *Australian Academy of Accounting and Finance Review,* 2(4), 363-371. Retrieved from http://aaafr.com.au/index.php/AAAFR/article/view/35

Zou, H., & Xiao, J., Z. (2006). The financing behaviour of listed Chinese firms. *The British Accounting Review*, 38(3), 239-258. Doi: https://doi.org/10.1016/j.bar.2006.04.008

Vishwasrao, S., & Bosshardt, W. (2001). Foreign ownership and technology adoption: evidence from Indian firms. *Journal of Development Economics,* Vol. 65, 367-387. Doi: https://doi.org/10.1016/S0304-3878(01)00141-9

Wahla, K., Shah, S., Z., A., & Hussain, Z. (2012). Impact of ownership structure on firm performance evidence from non-financial listed companies at Karachi Stock Exchange. *International Research Journal of Finance and Economics,* 84, 6-13. Doi: https://doi.org/10.5897/AJBM2014.7611

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Analysis of efficiency factors of companies in Serbia based on artificial neural networks

Анализа фактора ефикасности предузећа у Србији на бази вештачких неуронских мрежа

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Abstract: This paper investigates the influence of certain factors on the efficiency of companies in Serbia using artificial neural networks. According to the results of empirical research using artificial neural networks, the significance of some observed factors on the efficiency of companies in Serbia is as follows: net profit 55.5%, operating revenues 59.4%, operating assets 52.8%, capital 59.6 %, loss 100% and number of employees 51.3%. In order to improve the efficiency of companies in Serbia in the future, it is necessary, in the first place, to manage profits as efficiently as possible (i.e. to reduce losses as much as possible). This is also achieved with the most efficient management of sales, assets, capital and human resources (training, rewarding, job advancement, and flexible employment). Accelerated digitalization of the entire business certainly plays a significant role in that.

Keywords: efficiency, factors, artificial neural networks, Serbian companies
JEL classification: L81, M31, M41, O32

Сажетак: У овом раду се истражује утицај појединих фактора на ефикасност предузећа у Србији коришћењем вечтачких неуронских мрежа. Према добијеним резултатима емпиријског истраживања коришћењем вештачких неуронских мрежа значај појединих посматраних фактора на ефикасност предузећа у Србији је следећи: нето добитак 55.5%, пословни приходи 59.4%, пословна имовина 52.8%, капитал 59.6%, губитак 100% и број запослених 51.3%. У циљу побољшања ефикасности предузећа у Србији у будућности неопходно је, на првом месту, што ефикасније управљати профитом (тј. у што већој мери смањити губитак). То се постиже, исто тако, и са што ефикаснијим управљањем продајом, активом, капиталом и људским ресурсама (тренинг, награђивање, напредовање на послу, флексибилно И запошљавање). Значајну улогу у томе има свакако и убрзана дигитализација целокупног пословања.

Кључне речи: ефикасност, фактори, вештачке неуронске мреже, предузећа Србије
ЈЕЛ класификација: L81, M31, M41, O32

Introduction

In principle, the problem of researching the efficiency of companies based on artificial neural networks is very challenging (Rezaei et al., 2019; Sustrova, 2016; Machová1 & Vochozkal, 2019; Wanchoo, 2019; Sabau-Popa etal., 2021; Hafez etal., 2021). With this in mind, the subject of research in this paper are the efficiency factors of companies in Serbia using artificial neural networks. The goal and purpose of this is to investigate this issue as

comprehensively as possible in order to improve the efficiency of companies in Serbia through better control of key factors and the implementation of relevant measures.

The research of the problem treated in this paper is based on the hypothesis that the basic premise for improving the efficiency of companies (in this case in Serbia) is knowledge of critical factors (net profit, business revenues, business assets, capital, loss and number of employees) and their better control, as well as effective control of relevant measures taken in that direction. The given critical factors were chosen because, in our opinion, they determine the efficiency and financial performance of the company well. Input elements are: when measuring efficiency, number of employees, business assets, capital and output elements are: business revenues, loss and net profit.

The use of artificial neural networks plays a significant role in this. Artificial neural networks make it possible to see the impact of critical factors (net profit, business revenues, business assets, capital, loss and number of employees) on the success of a company's business. Their knowledge is a prerequisite for improving the business performance of companies through more efficient control. For these reasons, they are used in this paper.

The research of enterprise efficiency factors in Serbia using artificial neural networks is based on original empirical data for 25 companies from different sectors (5 companies each from the sectors: manufacturing, construction, wholesale and retail trade, J-Information and communication and public companies) collected from the Agency for Business Registers of the Republic of Serbia. The data are in line with relevant international standards and there are no limitations in terms of comparability at the domestic and international level.

1.Theoretical background

The As is well known, the literature dedicated to the assessment of the efficiency of companies based on artificial neural networks is becoming richer (Abiodun etal., 2018; Azarnoush & Arash, 2016; Beer etal., 2020; Gao et al., 2009; Hafez etal., 2021; Hasti etal., 2015; Liu, 2015; Huang etal., 2020; Lantz, 2019; Hütsch, 2021; Penpece & Elma, 2014; Sihem & Younes, 2017; Zhou & Gumbo, 2021, Shalev-Schwartz & Ben-David, 2014). However, there are very few, almost no complete works, as far as we know, dedicated to the analysis of the efficiency of companies in Serbia using artificial neural networks. This gap should be filled to some extent by this paper, and in particular, among other things, its scientific and professional contribution is reflected in it. Research through the literature in this paper, especially on the application of artificial neural networks in economics, serves as a theoretical, methodological and empirical basis for the analysis of the problem treated in this paper.

Motivations for adopting an artificial neural network include its flexibility in increasingly complex data structures, in creating extraordinary in conditions of sufficiently missing data, multicollinearity, and nonlinearity (Merkel etal., 2018). The advantage of artificial neural networks lies in their versatility, because they can be applied to almost any learning task (Leo etal., 2019). Numerous examples of successful practical application of

artificial neural networks have been presented in the literature (Croda etal., 2019; Strandberg & Alas, 2019; Droomer & Bekker, 2020; Penpece & Elma, 2014).

2. Research methodology

The research methodology of the treated problem in this paper is based on artificial neural networks. In mathematical form, artificial neural networks can be expressed as:

$$O = \sum_{i}^{1} w_i x_i + b \qquad (1)$$

wherein x_i i – input-layer of the artificial neural network, w_i – weight i-th inputs, n – the number of inputs, a – bias term and O – output layer.

The following types of neural networks are used in the experiment: single-layer Perceptron, multilayer Perceptron, Feed Forward Backpropagation neural network and Radial Basis Function Network.

3. Research results

A **multilayer Perceptron** (MLP), known as a multilayer transmission network, was used in this study (Lantz, 2019). The paper uses artificial neural networks to investigate the impact of the following factors on the efficiency of companies in Serbia, namely: net profit, operating revenues, operating assets, capital, loss and number of employees. Their efficiency control can certainly significantly affect the achievement of the target efficiency of companies in Serbia. Table 1 shows the initial data for 2019.

Table 1. Initial data

	Net profit VAR00001	Business revenues VAR00002	Business assets VAR00003	Capital VAR00004	Loss VAR00005	Number of employees VAR00006	Efficiency* VAR00007
TIGAR TYRES DOO PIROT	9.025	103.463	52.604	12.322	0	3.530	1.00
PHILIP MORRIS OPERATIONS AD NIŠ	4.659	22.598	24.408	15.997	0	575	1.00
AD IMLEK PADINSKA SKELA	4.380	21.246	45.408	8.633	5.940	935	1.00
HEMOFARM AD VRŠAC	3.979	35.899	48.841	34.906	0	2.666	1.00
COCA-COLA HBC-SRBIJA DOO ZEMUN	3.642	33.035	49.658	40.798	0	837	1.00
PREDUZEĆE IVAN MILUTINOVIĆ - PIM AD BEOGRAD	3.867	119	1.339	813	8.488	180	1.00
IDC DOO BEOGRAD	3.087	78.206	3.077	3.077	10	643	1.00
Beograd na Vodi	1.840	10.784	6.967	6.967	2.657	71	1.00

DOO Beograd							
INCOP Doo Čuprija	1.763	4.890	1.803	1.803	0	78	1.00
OAO Beltruboprovodstvoj ogranak Beograd	1.710	6.413	1.710	1.710	0	142	1.00
DELHAIZE SERBIA DOO BEOGRAD	5.175	104.869	86.264	58.851	0	12.579	1.00
JT INTERNATIONAL AD SENTA	1.918	19.271	15.275	4.374	4.056	282	1.00
AGROMARKET DOO KRAGUJEVAC	1.811	16.986	23.751	15.030	0	417	1.00
JUGOIMPORT-SDPR JP BEOGRAD	1.782	19.526	48.757	19.865	0	373	1.00
SPORT VISION DOO BEOGRAD	1.531	11.949	11.368	6.699	0	1.223	1.00
TELENOR DOO BEOGRAD	10.526	45.294	43.191	32.279	0	672	1.00
TELEKOM SRBIJA AD BEOGRAD	3.477	86.230	324.079	145.159	0	6.767	1.00
VIP MOBILE DOO BEOGRAD	3.381	33.496	50.283	0	60.416	1.151	.00
SBB DOO BEOGRAD	3.319	27.784	64.757	20.856	22.621	1.624	1.00
PRVA TELEVIZIJA DOO BEOGRAD	1.076	5.063	6.318	1.920	0	207	1.00
JP SRBIJAGAS NOVI SAD	4.772	91.487	202.556	118.797	0	1.021	1.00
JKP BEOGRADSKE ELEKTRANE BEOGRAD	4.018	28.770	57.886	42.459	298	2.004	.00
JP EPS BEOGRAD	3.662	279.637	973.624	674.555	119.720	24.966	.00
JP POŠTA SRBIJE BEOGRAD	1.932	25.291	30.505	24.638	0	14.922	1.00
JUGOIMPORT-SDPR JP BEOGRAD	1.782	19.526	48.757	19.865	0	373	1.00

Note: The data are expressed in millions of dinars (employees as an integer).
* The authors' assessment (efficiency is marked with the number 1.00, and inefficiency with the number .00. Companies with losses are treated as inefficient).

Source: Agency for Business Registers of the Republic of Serbia

When determining the significance of independent variables (i.e. efficiency factors of companies in Serbia) based on artificial neural networks, a **multilayer perceptron networks** was used, as already mentioned. The calculation was performed using the SPSS software program. The obtained results are shown in Table 2 - 7, and annex 1, as well as in Figures 1-4.

```
EXECUTE.
* Multilayer Perceptron Network.
MLP VAR00007 (MLEVEL = N) BY VAR00001 VAR00002 VAR00003 VAR00004 VAR00005 VAR00006
  / PARTITION TRAINING = 7 TESTING = 3 HOLDOUT = 0
  / ARCHITECTURE AUTOMATIC = YES (MINUNITS = 1 MAXUNITS = 50)
  / CRITERIA TRAINING = BATCH OPTIMIZATION = SCALEDCONJUGATE LAMBDAINITIAL =
0.0000005
    SIGMAINITIAL = 0.00005 INTERVALCENTER = 0 INTERVALOFFSET = 0.5 MEMSIZE = 1000
  / PRINT CPS NETWORKINFO SUMMARY CLASSIFICATION SOLUTION IMPORTANCE
  / PLOT NETWORK ROC GAIN LIFT PREDICTED
  / STOPPINGRULES ERRORSTEPS = 1 (DATA = AUTO) TRAININGTIMER = ON (MAXTIME = 15)
MAXEPOCHS = AUTO
    ERRORCHANGE = 1.0E-4 ERRORRATIO = 0.001
/ MISSING USERMISSING = EXCLUDE.
```

Table 2. Case Processing Summary

Case Processing Summary			
		N	Percent
Sample	Training	20	95.2%
	Testing	1	4.8%
Valid		21	100.0%
Excluded		4	
Total		25	

Source: the authors' own research

Case processing summary shows the number of cases included and excluded in the analysis. In the specific case, out of 25 analysed, 4 companies were excluded in the data processing process. 20 companies were trained (95.2%), and 1 company was tested (4.8%).

Table 3. Network information

Network information			
Input layer	Factors	1	VAR00001
		2	VAR00002
		3	VAR00003
		4	VAR00004
		5	VAR00005
		6	VAR00006
	Number of units [a]		109
Hidden layer (s)	Number of hidden layers		1
	Number of units in hidden layer 1 [a]		7
	Activation function		Hyperbolic tangent
Output layer	Dependent variables	1	VAR00007

	Number of units	2
	Activation function	Softmax
	Error function	Cross-entropy
a. Excluding the bias unit		

Source: the authors' own research

Network information shows information about the neural network (Input layer, Hidden layer, Output layer). They are useful for ensuring that the specifications are correct. In the analysed case, there is only 1 hidden layer with 7 units.

Table 4. Model Summary

Model Summary		
Training	Cross entropy error	1.347E-5
	Percentage of incorrect predictions	0.0%
	Stopping rule used	Training error ratio criterion (.001) achieved
	Training time	0: 00: 00.01
Testing	Cross entropy error	8.546E-8
	Percentage of incorrect	0.0%
Dependent variable: VAR00007		

Source: the authors' own research

Model summary shows the percentage of incorrect predictions. In this case: the percentage of incorrect predictions is 0.0%.

(*Annex 1* shows the parameter estimates. The table parameter estimates primarily specify the weights and biases more precisely. In this case: the estimate of, say, parameter H (1: 7) in category 0.00 (inefficient) is .877 (87.7%) and in category 1.00 (efficient) -.96.4 (-96.4%). The accuracy is therefore at a satisfactory level.)

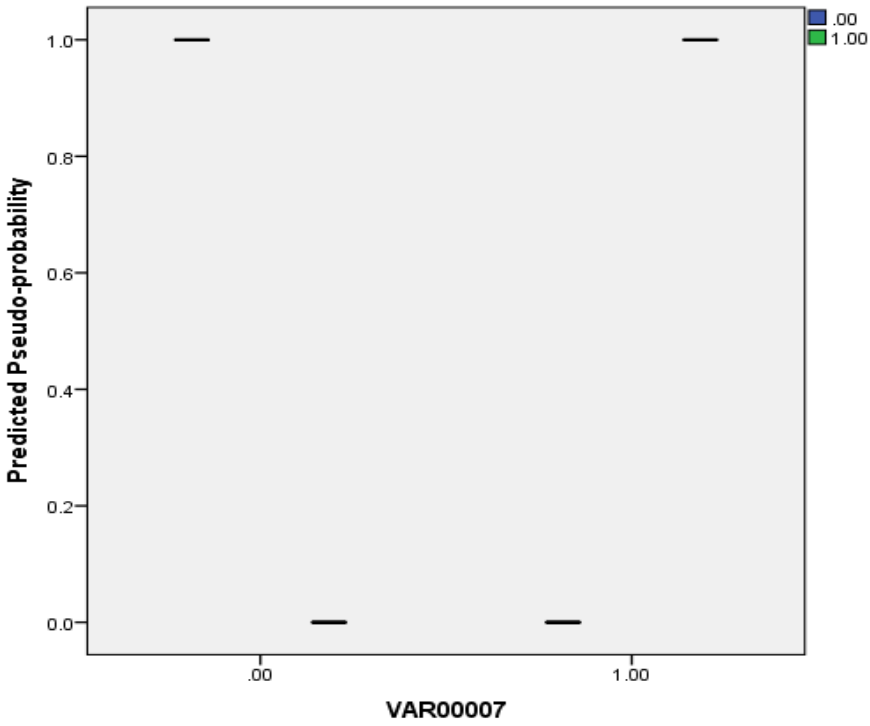
Table 5. Classification

Classification				
		Predicted		
Sample	Observed	.00	1.00	Percent correct
Training	.00	3	0	100.0%
	1.00	0	17	100.0%
	Overall percent	15.0%	85.0%	100.0%
Testing	.00	0	0	0.0%
	1.00	0	1	100.0%
	Overall percent	0.0%	100.0%	100.0%
Dependent variable: VAR00007				

Source: the authors' own research

The classification table shows the results of the use of neural networks. The values on the diagonal are correct and the predictions below are incorrect. Neural network performance is determined by generalizing missing as well as predicting unused data during network training. So, for example, 3 inefficient companies (15.0%) and 17 efficient companies (85.0%) were trained. Only 1 efficient company (100%) was tested. Insight into the field training sample and testing sample shows that all values are outside the diagonal 0, indicating 100% prediction accuracy. The conclusion is that the predictions are correct.

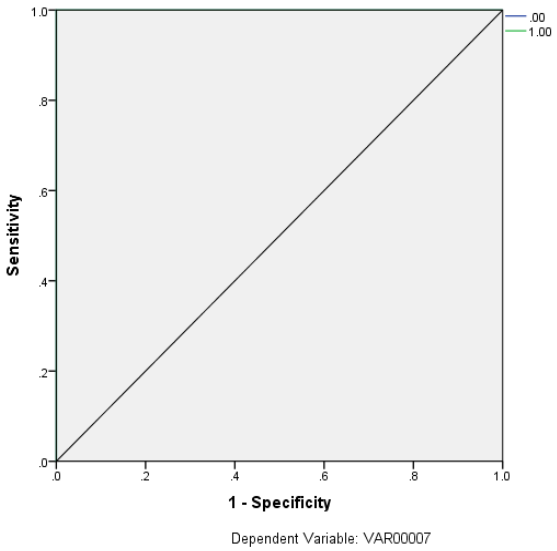
Figure 1. Predicted - observed chart



Source: the authors' image

The Predicted by observed chart shows the predicted values for each dependent variable. For categorical dependent variables, clustered boxplots of predicted pseudo probabilities are displayed for each response category, with the observed response category as the cluster variable. The scattering diagram is displayed for variable dependent variables.

Figure 2. ROC Curve



Source: the authors' image

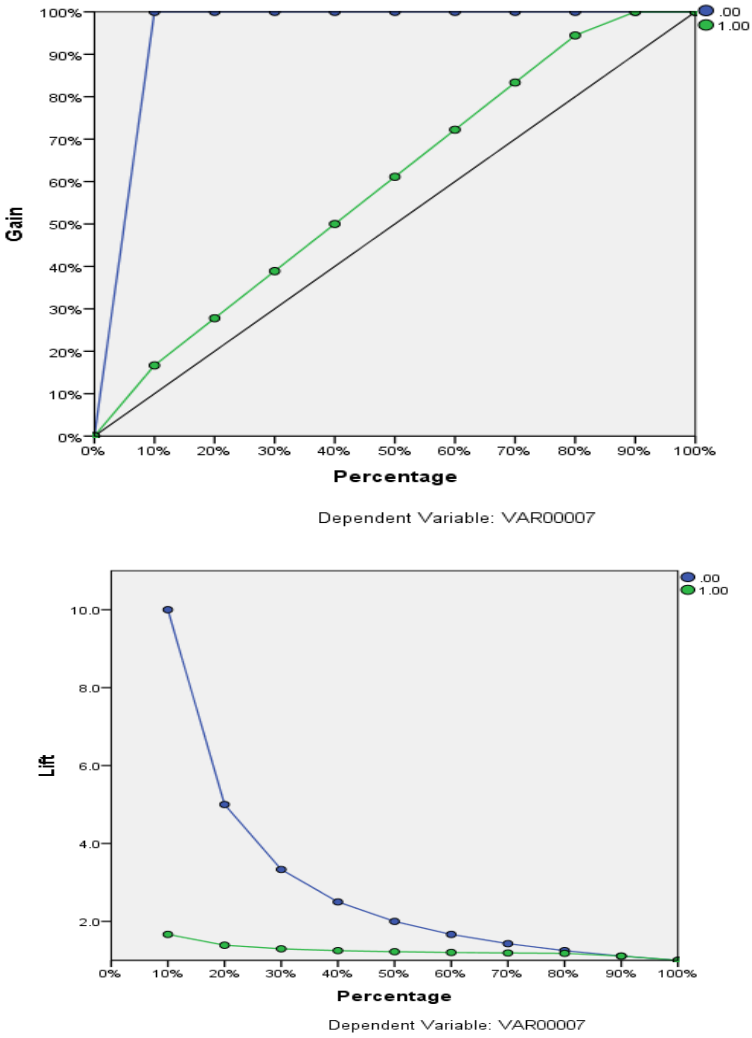
Table 6. Area under the curve

Area under the curve		
		Area
VAR00007	.00	1,000
	1.00	1,000

Source: the authors' own research

RCO (Receiver Operating Characteristic) is displayed for each category dependent variable. The table shows the area below each curve. The ROC curve chart reveals the percentage of "false" positives, i.e. efficient units. Thus, for example, in a specific case, at a point on the reference line with 20% of sensitive and 20% of specifics, 80% (100% - 20%) of inefficient units can be expected. The explanation is similar for other percentages (points) on the reference line.

Figure 3. Cumulative Gain and Lift



Source: the authors' image

The cumulative gains chart shows the cumulative gains for each category-dependent variable. The lift chart shows the lift for each category dependent variable. They are used to assess the performance of the classification model, and supplement the RCO curve. Metrics are very popular in marketing analytics. They can be successfully used for risk modelling, supply chain analysis, to find the best predictive model among multiple challenger models, etc. Thus, for example, according to the presented chart of cumulative gain category 1.00 (efficient): for 10% of effective cases it can be (according to the

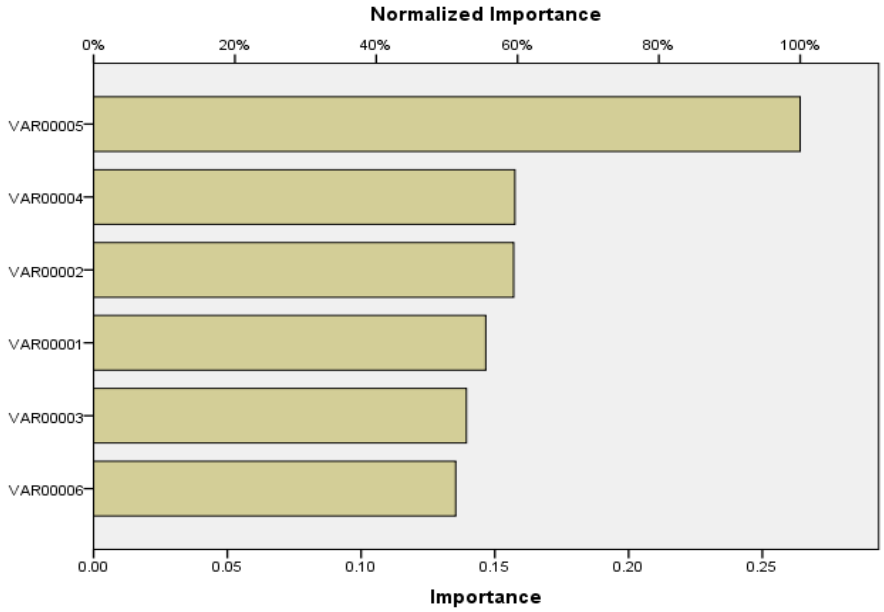
probability test) expected to be approximately 20% ineffective; 50% of effective cases can be expected to be 60% ineffective; 90% of effective cases can be expected to be 100% ineffective; etc. The Lift chart is derived from the cumulative gain chart. Thus, for example, according to the presented chart for category 1.00 (effective) the ratio of cumulative gain for percentages of 10%, 40%, 90% is: 20/10% = 2; 50% / 40% = 1.25; 100% / 90% = 1.11; etc.

Table 7. Independent Variable Importance

	Independent Variable Importance		
		Importance	Normalized Importance
Net profit	VAR00001	.147	55.5%
Business revenues	VAR00002	.157	59.4%
Business assets	VAR00003	.139	52.8%
Capital	VAR00004	.157	59.6%
loss	VAR00005	.264	100.0%
Number of employees	VAR00006	.135	51.3%

Source: the authors' own research

Figure 4. Normalized Importance



Source: the authors' image

Normalized importance chat illustrates the importance of the analysed factors.

4. Discussion

According to the obtained results of empirical research using artificial neural networks, the importance of certain observed independent variables (factors), expressed as a percentage, for the efficiency of companies in Serbia is as follows: net profit 55.5%, operating revenues 59.4%, operating assets 52.8%, capital 59.6%, loss 100% and number of employees 51.3%.

In order to improve the efficiency of companies in Serbia in the future, it is necessary, primarily, to manage profits as efficiently as possible (i.e. to reduce losses as much as possible). This is also achieved with the most efficient management of sales, assets, capital and human resources (training, rewarding, job advancement, flexible employment, health and pension insurance). Accelerated digitalization of the entire business certainly plays a significant role in that.

Research in this paper has shown that artificial neural networks are excellent for determining the impact of certain factors on the efficiency of enterprises in Serbia. Because they enable the perception of complex connections between input and output elements. Considering that, in addition to other methods, artificial neural networks should be used in the analysis of company efficiency factors in Serbia.

Conclusion

Based on the obtained results of empirical research using artificial neural networks, it can be stated that the importance of certain observed factors (expressed as a percentage) on the efficiency of companies in Serbia is as follows: net profit 55.5%, operating revenues 59.4%, operating assets 52.8%, capital 59.6%, loss 100% and number of employees 51.3%.

All in all, in order to improve the efficiency of companies in Serbia in the future, it is necessary to manage profits as efficiently as possible (i.e. to reduce losses as much as possible). This is also achieved with the most efficient management of sales, assets, capital and human resources (training, rewarding, job advancement, flexible employment). In any case, the accelerated digitalization of the entire business has a significant role in that.

As far as the effects of the implication are concerned, we can say the following: research in this paper has clearly shown that the very effective application of artificial neural networks in identifying the strength of the influence of factors on the efficiency of enterprises in Serbia. Therefore, the use of artificial neural networks is recommended, especially in combination with other related statistical techniques and multicriteria decision-making methods.

When researching the efficiency factors of companies in Serbia using artificial neural networks, one should keep in mind the extent to which empirical data are accurate. In this respect, they certainly differ from one company to another "due to a certain haircut" from certain (for example, increasing profits to obtain a bank loan), despite the fact that relevant international standards are applied.

Generally speaking, the limiting factor of application in economics and management, in this case in the analysis of the efficiency factors of companies in Serbia, is still insufficient knowledge of the theoretical, methodological and empirical significance of artificial neural networks. In the future, thanks to a better knowledge of the essence, the importance of the application of artificial neural networks in general in economics and management in various research areas (for example, credit risk assessment) will become even more important.

References

Abiodun, O. I., Jantan, A., Omolara, A. E., Dada, K. V., Mohamed, N. A., & Arshad, H. (2018). State-of-the-art in artificial neural network applications: a survey. *Heliyon*, 4(11), e00938. https://doi.org/10.1016/j.heliyon.2018.e00938

Azarnoush, A., & Arash, A. (2016). Modelling and evaluating customer loyalty using neural networks: evidence from startup insurance companies. *Future Business Journal*, 2(1), 15-30. Doi: http://dx.doi.org/10.1016/j.fbj.2016.04.001

Beer, K., Bondarenko, D., & Farrelly, T. et al. (2020). Training deep quantum neural networks. *Nat Commun*, 11, 808. Doi: https://doi.org/10.1038/s41467-020-14454-2

Croda, R. M. C., Romero, D. E. G., & Morales, S. O. C. (2019). Sales prediction through neural networks for a small dataset. *IJIMAI*, 5(4), 35–41. Doi: https://doi.org/10.9781/ijimai.2018.04.003

Droomer, M., & Bekker, J. (2020). Using machine learning to predict the next purchase date for an individual retail customer. *South African Journal of Industrial Engineering*, 31(3), 69–82. Doi: https://doi.org/10.7166/31-3-2419

GAO, Y., Liang, Y., Liu, Y., Zhan, S., & Ou, Z. (2009). A neural-network-based forecasting algorithm for retail industry. *International Conference on Machine Learning and Cybernetics*, 919-924. Doi: https://doi.org/10.1109/ICMLC.2009.5212392

Hafez, M. M., Fernández, V. A., Redondo, R. P.D., & Pazó, H. O. (2021). Classification of retail products: from probabilistic ranking to neural networks. *Appl. Sci.,* 11(9), 4117. Doi: https://doi.org/10.3390/app11094117

Hasti, C., Rajan, N., & Chawla, D. (2015). An analysis of retail supply chains; simulation in neural networks and maximum flow networks. *DIAS TECHNOLOGY REVIEW*, 12(1). Doi: https://ssrn.com/abstract=3823059

Huang, J., Chai, J., & Cho, S. (2020). Deep learning in finance and banking: a literature review and classification. *Front. Bus. Res. China,* 14, 13. Doi: https://doi.org/10.1186/s11782-020-00082-6

Hütsch, M. (2021). Comparing architectures of neural networks for an integration in enterprise systems: a retail case study. *Procedia Computer Science*, 181, 619-627. Doi: https://doi.org/10.1016/j.procs.2021.01.209.

Lantz, B. (2019). *Machine Learning with R: Expert Techniques for Predictive Modelling*. Packt Publishing.

Leo, M., Sharma, S., & Maddulety, K. (2019). Machine learning in banking risk management: a literature review. *Risks*, 7(1), 29–51. Doi: https://doi.org/10.3390/risks7010029

Liu, H. J. (2015). Forecasting model of supply chain management based on neural network. International Conference on Automation, Mechanical Control and Computational Engineering (AMCCE 2015).

Machová1, V.Ÿ., & Vochozka1, M. (2019). Analysis of business companies based on artificial neural networks. SHS Web of Conferences 61, 01013, 1-12 Doi: https://doi.org/10.1051/shsconf/20196101013 IES2018

Merkel, G. D., Povinelli, R. J., & Brown, R. H. (2018). Short-term load forecasting of natural gas with deep neural network regression. *Energies*, 11(8), 2008. Doi: https://www.mdpi.com/1996-1073/11/8/2008

Penpece, D., & Elma, O. E. (2014). Predicting sales revenue by using artificial neural network in grocery retailing industry: a case study in Turkey. *International Journal of Trade, Economics and Finance*, 5(5), 435–440. Doi: https://doi.org/10.7763/IJTEF.2014.V5.411

Rezaei, S., Shokouhyar, S., & Zandieh, M. (2019). A neural network approach for retailer risk assessment in the aftermarket industry. *Benchmarking: An International Journal*, 26(5). 1631-1647. Doi: https://doi.org/10.1108/BIJ-06-2018-0162

Sabau-Popa, C. D., Popa, N., Victoria, B., & Ramona. S. (2021). Composite financial performance index prediction – a neural networks approach. *Journal of Business Economics and Management,* 22, 277-296. Doi: https://doi.org/10.3846/jbem.2021.14000.

Shalev-Shwartz, S., & Ben-David, S. (2014). *Understanding Machine Learning: From Theory to Algorithms*. Cambridge University Press. Doi: https://doi.org/10.1017/CBO9781107298019

Sihem, K., & Younes, B. B. (2017). Artificial intelligence for credit risk assessment: artificial neural network and support vector machines. *ACRN Oxford Journal of Finance and Risk Perspectives*, 6(2), 1- 17.

Strandberg, R., & Alas, J. (2019). A comparison between neural networks, Lasso regularized logistic regression, and gradient boosted trees in modelling binary sales. Master's project, KTH Royal Institute of Technology, Stockholm.

Sustrova, T. (2016). An artificial neural network model for a wholesale company's order-cycle management. *International Journal of Engineering Business Management (IJEBM)* First Published January 1. Doi: https://doi.org/10.5772/63727

Wanchoo, K. (2019). *Retail demand forecasting: a comparison between deep neural network and gradient boosting method for univariate time series*," 2019 IEEE 5th International Conference for Convergence in Technology (I2CT), 1-5. Doi: https://doi.org/10.1109/I2CT45611.2019.9033651

Zhou, H., & Gumbo, V. (2021). Supervised machine learning for predicting SMME sales: an evaluation of three algorithms. *The African Journal of Information and Communication (AJIC)*, 27, 1-21. Doi: https://doi.org/10.23962/10539/31371

ANNEX

Annex 1. Parameter estimates

Parameter estimates										
		Predicted								
		Hidden layer 1							Output layer	
Predictor		H(1:1)	H(1:2)	H(1:3)	H(1:4)	H(1:5)	H(1:6)	H(1:7)	[VAR00007=.00]	[VAR00007=1.00]
Input layer	(Bias)	.098	.583	.366	.791	-.501	.010	-.579		
	[VAR00001=1.08]	.145	.426	-.347	-.101	.169	-.072	-.122		
	[VAR00001=1.53]	.479	-.062	.401	.149	-.174	-.097	.016		
	[VAR00001=1.71]	-.305	.315	.406	.445	-.500	-.272	.211		
	[VAR00001=1.78]	.363	.135	.382	-.042	-.334	.036	-.438		
	[VAR00001=1.81]	.437	-.006	-.063	.433	.046	.422	.182		
	[VAR00001=1.84]	.195	.326	.443	-.081	.032	.329	.268		
	[VAR00001=1.92]	.360	.316	-.255	.047	.139	.156	-.469		
	[VAR00001=1.93]	-.216	.144	.519	.342	.013	.219	-.436		
	[VAR00001=3.09]	-.293	.071	.564	.610	.243	-.148	.145		
	[VAR00001=3.32]	.024	.282	.355	.386	.293	.160	-.352		
	[VAR00001=3.38]	.097	-.550	-.176	-.564	.051	-.311	.658		
	[VAR00001=3.48]	.134	.382	.519	.179	.243	-.393	.254		
	[VAR00001=3.64]	.345	-.111	.043	.548	.312	.126	.115		
	[VAR00001=3.66]	-.565	-.449	-.158	-.669	.017	-.115	.346		
	[VAR00001=3.98]	-.247	.132	-.231	.487	.217	-.363	.450		
	[VAR00001=4.02]	-.655	-.515	-.209	-.052	.621	.306	.402		
	[VAR00001=4.38]	-.062	.040	.494	.437	-.039	-.244	.394		
	[VAR00001=4.77]	-.154	.325	.409	.355	-.202	.081	.289		
	[VAR00001=5.18]	-.188	-.177	.088	.291	-.128	-.039	.082		
	[VAR00001=10.53]	.296	-.236	.309	.422	-.292	-.425	.336		
	[VAR00002=5.06]	-.436	.204	.235	.081	.061	-.152	-.482		
	[VAR00002=6.41]	.217	.511	-.161	-.266	-.390	.132	.280		
	[VAR00002=10.78]	.254	-.086	.503	.019	.258	-.361	-.326		

	[VAR00002=11.95]	.565	.054	.199	.439	.020	.273	.071		
	[VAR00002=16.99]	.347	-.074	.263	.332	-.035	-.304	-.209		
	[VAR00002=19.27]	.156	-.285	.282	-.239	-.274	-.185	-.506		
	[VAR00002=19.53]	.478	-.110	-.306	.026	-.501	-.251	-.109		
	[VAR00002=21.25]	.211	.231	.204	-.008	.015	-.214	-.345		
	[VAR00002=25.29]	.292	-.398	.085	-.315	.425	-.310	-.057		
	[VAR00002=27.78]	.247	.107	.461	.268	-.303	.290	-.308		
	[VAR00002=28.77]	-.139	.154	-.181	-.456	.308	.031	.137		
	[VAR00002=33.04]	-.024	-.040	-.070	.070	-.028	-.149	-.256		
	[VAR00002=33.50]	-.230	.198	-.137	-.731	.430	.191	.496		
	[VAR00002=35.90]	-.330	.352	.292	.336	.056	.438	.069		
	[VAR00002=45.29]	-.062	.326	-.406	.406	.413	.025	-.335		
	[VAR00002=78.21]	.290	-.330	.541	-.192	-.006	-.488	-.619		
	[VAR00002=86.23]	.489	.364	.302	.394	.284	.207	-.444		
	[VAR00002=91.49]	.354	.283	.226	.438	-.115	-.520	.349		
	[VAR00002=104.87]	-.048	-.408	.179	.434	-.414	.051	.184		
	[VAR00002=279.64]	.203	-.577	-.678	-.266	.845	.145	.643		
	[VAR00003=1.71]	-.261	-.111	-.288	-.043	-.247	.022	-.241		
	[VAR00003=3.08]	-.287	-.280	.010	.149	-.050	.281	-.075		
	[VAR00003=6.32]	.471	.092	.014	-.046	-.449	-.075	.151		
	[VAR00003=6.97]	.364	-.049	-.108	.592	.145	-.454	.201		
	[VAR00003=11.37]	.044	-.380	.458	.038	.373	.460	-.412		
	[VAR00003=15.28]	.167	-.140	.132	.092	-.088	-.243	-.154		
	[VAR00003=23.75]	-.366	-.102	.262	-.072	-.001	-.173	-.159		
	[VAR00003=30.51]	.159	.393	.477	-.143	.205	-.357	-.390		
	[VAR00003=43.19]	.065	-.328	.280	-.142	-.371	.330	.370		
	[VAR00003=45.41]	.029	-.022	.439	.391	-.033	-.406	.259		
	[VAR00003=48.76]	-.002	-.021	.524	-.171	-.092	.119	.058		
	[VAR00003=48.84]	.137	.061	-.084	.215	-.279	-.265	-.097		
	[VAR00003=49.66]	-.005	.483	-.232	.171	.369	-.054	-.217		

	[VAR00003=50.28]	-.446	-.434	-.003	.038	.665	.387	.269		
	[VAR00003=57.89]	-.189	-.339	-.070	-.663	.286	.313	.716		
	[VAR00003=64.76]	-.159	.536	-.066	-.033	.021	-.031	.207		
	[VAR00003=86.26]	.026	-.217	.163	.416	.244	.254	-.481		
	[VAR00003=202.56]	-.151	-.394	-.174	-.104	.312	.297	.207		
	[VAR00003=324.08]	-.251	.161	-.415	-.274	.397	-.319	.362		
	[VAR00003=973.62]	-.004	-.117	-.176	-.304	.598	.286	-.092		
	[VAR00004=.00]	-.526	-.266	-.208	-.591	.685	.298	.604		
	[VAR00004=1.71]	-.057	.211	-.321	.318	.236	.146	.397		
	[VAR00004=1.92]	.108	-.247	.336	-.029	-.074	.295	-.476		
	[VAR00004=3.08]	.643	.520	-.105	-.073	-.301	-.083	-.448		
	[VAR00004=4.37]	-.023	.039	-.263	.136	.025	-.277	-.052		
	[VAR00004=6.70]	-.409	.249	-.224	-.356	.341	-.238	.149		
	[VAR00004=6.97]	.119	-.189	.028	.202	.225	.113	-.511		
	[VAR00004=8.63]	-.098	-.307	-.089	-.076	-.468	-.442	-.179		
	[VAR00004=15.03]	.414	-.012	-.412	-.307	-.160	.456	.184		
	[VAR00004=19.87]	-.328	-.007	.458	.126	.002	-.291	.267		
	[VAR00004=20.86]	.561	-.311	-.144	.011	-.128	.002	.040		
	[VAR00004=24.64]	.468	-.284	.015	.341	-.514	.152	-.405		
	[VAR00004=32.28]	-.016	-.210	.466	.122	.324	.196	.114		
	[VAR00004=34.91]	-.226	.453	-.350	.101	.320	-.278	-.485		
	[VAR00004=40.80]	.250	.038	-.113	-.336	.018	.159	.118		
	[VAR00004=42.46]	.074	-.335	-.559	-.418	.683	.445	-.147		
	[VAR00004=58.85]	.214	.077	.084	.253	-.143	.234	-.277		
	[VAR00004=118.80]	.517	-.264	-.265	-.311	-.143	.296	.209		
	[VAR00004=145.16]	-.261	-.050	.182	.201	-.198	-.442	-.388		
	[VAR00004=674.56]	-.324	.092	-.554	-.475	.760	.305	.689		
	[VAR00005=.00]	.977	.767	.641	.469	-.984	-.498	-.745		
	[VAR00005=2.66]	.150	.584	-.069	.367	-.533	-.075	-.002		

	[VAR00005=4.06]	.637	.466	.667	.431	.029	-.336	.301		
	[VAR00005=5.94]	.442	.506	.166	-.157	.297	-.193	.211		
	[VAR00005=10.00]	.408	.089	-.081	.108	-.143	.418	.207		
	[VAR00005=22.62]	-.117	-.190	.331	.236	.084	-.012	-.438		
	[VAR00005=60.42]	-.357	-.505	.131	-.197	.282	.346	.095		
	[VAR00005=119.72]	-.491	-.233	-.475	-.633	.602	-.268	.009		
	[VAR00005=298.00]	.015	-.010	-.374	-.379	.183	-.117	.171		
	[VAR00006=1.02]	-.167	.075	-.374	.585	.035	-.021	.221		
	[VAR00006=1.15]	-.096	-.522	-.464	-.320	.482	-.095	.356		
	[VAR00006=1.22]	-.267	-.269	-.380	.370	.083	-.266	.318		
	[VAR00006=1.62]	.124	.069	.322	-.049	-.439	-.572	-.391		
	[VAR00006=2.00]	.028	-.330	-.162	-.475	.021	.034	.801		
	[VAR00006=2.67]	-.314	.065	.367	.019	-.485	-.356	.231		
	[VAR00006=6.77]	.269	.337	-.319	-.069	-.515	-.034	-.099		
	[VAR00006=12.58]	.222	.284	-.386	-.120	.023	-.051	.246		
	[VAR00006=14.92]	-.349	-.150	-.447	-.289	-.474	-.449	-.264		
	[VAR00006=24.97]	-.707	.044	-.578	-.080	.261	.300	.726		
	[VAR00006=71.00]	.187	.080	.021	-.029	.343	-.259	.072		
	[VAR00006=142.00]	-.305	-.113	.227	.192	.239	.099	-.457		
	[VAR00006=207.00]	.202	.402	-.188	.527	-.220	.189	.375		
	[VAR00006=282.00]	-.250	.097	-.316	.665	-.647	.000	-.110		
	[VAR00006=373.00]	-.375	.275	-.260	.060	.272	-.034	.222		
	[VAR00006=417.00]	.321	.468	.140	-.090	-.155	-.068	.214		
	[VAR00006=643.00]	.199	.292	.152	-.219	-.119	-.422	.029		
	[VAR00006=672.00]	.439	.202	.205	-.111	.020	.185	.358		
	[VAR00006=837.00]	-.093	-.172	-.081	-.146	-.498	.054	-.237		
	[VAR00006=935.00]	.019	.279	.233	-.327	-.508	-.069	-.421		
Hidden layer	(Bias)								-.802	.670
	H(1:1)								-.872	1.058

1	H(1:2)								-1.022	.862
	H(1:3)								-.775	.412
	H(1:4)								-2.865	2.338
	H(1:5)								.930	-1.420
	H(1:6)								1.658	-1.135
	H(1:7)								.877	-.964

Source: the authors' own research

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Effects of socio-demographic factors on leadership style in Serbian banking industry[1]

Ефекти социодемографских фактора на стилове лидерства у банкарском сектору у Србији

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Abstract: The main aim of this paper is to investigate the effects that gender, age, and educational level have on leadership styles, based on the Multifactor Leadership Questionnaire (MLQ) methodology. The sample used in the research comprises 140 managers from the banking sector in Serbia. The research was performed in 2019. The research methodology includes a literature review in the area of leadership and a statistical analysis of the data collected. The regression models were created to investigate the relations between leadership styles and demographic factors of age and educational level of managers. The results of the research pointed that there are positive statistically significant relations between the transformational and transactional leadership styles and level of education, while in the case of age, there are negative relations observed. The authors presented practical and theoretical implications and limitations of the study.
Keywords: transformational leadership; transactional leadership; passive leadership; age, education, Serbia.
JEL classification: M10, M50

Сажетак: Главни циљ овог рада је истраживање ефеката које пол, старост и образовни ниво имају на стилове лидерства, на основу методологије Multifactor Leadership Questionnaire (MLQ). Узорак коришћен у истраживању обухвата 140 менаџера из банкарског сектора у Србији. Истраживање је спроведено 2019. године. Методологија истраживања укључује преглед литературе из области лидерства и статистичку анализу прикупљених података. Регресиони модели су креирани да истраже односе између стилова

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лидерства и демографских фактора старости и образовног нивоа менаџера. Резултати истраживања су указали да постоје позитивни статистички значајни односи између трансформационог и трансакционог стила лидерства и нивоа образовања, док се у случају старости примећују негативни односи. Аутори су представили практичне и теоријске импликације и ограничења студије.
Кључне речи: трансформационо лидерство; трансакционо лидерство; пасивно лидерство; старост, образовање, Србија
ЈЕЛ класификација: M10, M50

Introduction

There are numerous studies on leadership styles and relations to outcomes and performances (Birasnav, 2014; Koo & Park, 2018; Poels et al., 2020; Gemeda & Lee, 2020; Strugar Jelača et al., 2020; Bjekić et al., 2021). The importance and significance of these researches on leadership arise along with the changing and continuously unpredictable business environment. Modern companies need to have managers that can anticipate innovative changes, and that are capable of making changes and improvements on each level in organizational structure. Also, they need to create adequate working environment in order to avoid stress, burnout, depression, and similar conditions of their employees (Josipović et al., 2020, p. 60). In that sense, leadership can be understood as "the ability of a person to influence other people in the processes of work, creativity, and achievement of the goals of the organization, and as a critical factor for the success of organizations, and a resource for building a competitive advantage and corporate performances" (Berber et al., 2019, p. 168). Modern leadership depends on contemporary issues, and "leaders prefer a leadership style that is appropriate to the specific situation" (Rodić & Marić, 2021, p. 55). According to Gardašević et al. (2021) "what requires changes in leadership is a person who has become a knowledge worker, the bearer of most of the assets of an enterprise in the form of intellectual capital, a highly educated individual, a specialist or an expert" (p. 80). Leaders use their influence and their authority comes from personal relationships (Simić, 2020, p. 10).

Having in mind the importance of leadership, it is very interesting to investigate what makes a good leader. The research question could be proposed as: *Is there a connection between certain social demographic factors like gender, age, marriage status, or educational level and specific leadership style of a leader*? This question was investigated in previous studies worldwide, with different and usually unclear results (Shadare, 2011; Kara et al., 2018; Oc, 2018; Sarıköse & Türkmen, 2020).

The main aim of this paper is to investigate the effects that socio-demographic factors, like sex, age, and educational level have on leadership styles, based on the Multifactor Leadership Questionnaire (MLQ) methodology (Bass & Avolio, 2004; Strugar Jelača et al., 2016). The sample used in the research comprises 140 managers from the banking sector in Serbia. The research was performed in 2019. The research methodology includes a literature review in the area of leadership and a statistical analysis of the data collected. The regression models were created to investigate the relations between leadership styles and demographic factors. The authors used SPSS 21.0 for statistical analysis.

The paper consists of four parts. In the first part, the authors investigated the concept of leadership, and research results from the previous period related to the leadership styles, and their relations with the demographic factors. In the second part of the paper, the authors presented the research methodology. The third part of the paper is dedicated to the presentation of the results and the discussion of the main research implications. The final part presents conclusions and limitations of the research, as well as possibilities for future research.

1. Theoretical background

This part of the research consists of two main themes. The first one is related to the notion of leadership styles, while the second one is related to the evidence about the effects of demographic factors on leadership styles.

For this research, and based on the MLQ methodology, the authors of this research observed three well-known leadership styles, i.e. transformational, transactional, and passive. Transformational leadership is composed of idealized influence (attributed), idealized influence (behavior), inspirational motivation, intellectual stimulation, and individualized consideration (Muterera et al., 2018). Leaders who apply a transformational leadership style are called agents of change (Rowold & Heinitz, 2007, p. 122). They are the initiators of changes, they are taking risks, they are attached to their followers and trust them, and they are flexible and open to new challenges. In addition, they are visionaries and believe in themselves (Bjekić & Strugar Jelača, 2020). Transformational leaders emphasize motivation as an important factor both from the aspect of self-motivation and from the aspect of encouraging followers on the way to achieving set goals (Bjekić, 2021, p. 25). They "strive to raise the level of consciousness of their followers by promoting moral values and 'more' emotions and goals, which include freedom, justice, equality, peace and others" (Tasić et al., 2020, p. 33).

Transactional leadership consists of contingent reward, active management by exception, and passive management by exception (Bass & Avolio, 2004). This is more of a kind of management style than a leadership style because the focus of this style is on identifying target behaviors and reinforcing them through reward and punishment (Bjekić, 2021, p. 26-27). A transactional leader is a leader who is very pragmatic and realistic, focused on goals and results, very resistant to change, and not inclined to empower employees and emphasize their individuality, then does not value thinking outside the box and discourages independent thinking. Transaction leaders are significantly more focused on ultimate achievement than on employee well-being (Sid, 2019).

Passive leadership is such a style in which leaders avoid decision-making, abdicate responsibility, and do not use authority. This leadership style is considered passive and ineffective. Leaders who apply this style are often absent, not providing support to their followers (Bjekić, 2021, p. 28). It consists of passive management by exception and avoiding involvement (Berber et al., 2019).

The second part of theoretical considerations is related to the investigation of the effects of social demographic factors (sex, age, and educational level) on leadership styles.

Stempel et al. (2015) found that transformational leadership is more typical for female leaders. Inside transformational leadership, inspirational motivation and idealized influence attributed were gender-neutral. In the case of transactional leadership, the contingent reward was perceived to be more typical of female leaders, whereas management by exception was rated as neutral. Passive leadership also was gender-neutral. Vinkenburg et al. (2011) found that inspirational motivation was perceived as more important for men than women, while an opposite relation was found for individualized consideration. Women leaders tend to assume more often than men attitudes oriented on encouragement, motivation, and guidance of the team members throughout their professional route and through the fulfilling of work tasks (Costache, 2018, p. 8). According to Carless (1998), female managers are more transformational than male managers. Women leaders displayed certain key aspects of transformational leadership more frequently than men leaders, which means that women are no less transformational than men (Bass et al., 1996; Silva & Mendis, 2017). On the other hand, Alghamdi et al. (2018) found that nurses surveyed in their research reported higher job satisfaction and perceived transformational leadership style of their male managers. Also, the results of a meta-analysis on sex differences in leadership styles of Van Engen and Willemsen (2004) show that women tend to use more of the democratic and transformational leadership styles than men. "Sex differences in leadership styles are contingent upon the context in which male and female leaders work, as both the type of organization in which the leader works and the setting of the study turn out to be moderators of sex differences in leadership style" (Van Engen & Willemsen, 2004, p. 3). Based on the above-mentioned, we can state that sex does influence a specific leadership style.

Besides sex, the age of leaders was also a theme concerning its influence on leadership styles. Costache (2018) found that laissez-faire leadership style was significantly higher for the group of leaders in the age group of 41 and 50 than for the age group over 50 years of life. In the case of the sample of five-star hotel employees in Turkey, Kara et al. (2018) found that age has a negative statistically significant relation to transformational leadership, while with transactional there was no relationship. In the case of transactional leadership, Ng and Sears (2012) found a positive relationship between age and transactional leadership style and diversity practice, in terms that indicated that firms with CEOs high in transactional leadership were significantly more likely to implement organizational diversity practices when their CEO was older. Oshagbemi (2004) found that younger and older managers differ in consultative and participative leadership styles. Older managers consulted more widely and favor more participation in comparison with younger managers. Gemeda and Lee (2020) found negative relationships between the age of a leader and transformational and transactional styles. It is obvious from these studies that age has effects on leadership style, but these effects are not uniform, so additional research is needed.

Finally, one more important demographic characteristic that can influence leadership style is educational level. Namely, it is expected that more educated managers will practice

more transformational than managers with less education. Managers that possess more knowledge about business, organizational psychology, human resource management, leadership, etc., can create a big picture of the business, and the roles of their followers, and handle all challenges more efficiently than people with basic knowledge on business tasks. They tend to become more sensitive to their followers, they know how to motivate them, to inspire them, and therefore, increase their performance to achieve business and organizational goals, too. Bozkurt and Goral (2014) and Mohammed et al. (2012) did not find statistically significant differences between educational level and leadership style, while Berendt et al. (2012) claim that today's managers need to be more educated to fulfill all business needs. Also, Barbuto et al (2007) found that the leader's level of education had a significant main effect on transactional and transformational behaviors. For example, leaders who had earned an advanced degree exhibited the highest rating level in individualized consideration (a part of transformational leadership style).

Based on the abovementioned, it is clear that the sex, age, and educational level of leaders influence their leadership style in terms of leadership behaviors. Therefore, in the next part of the paper, the author investigated these three social demographic factors on perceived leadership styles, transformational, transactional, and passive.

2. Methodology

The methodology of the empirical part of the research is based on the Multifactor Leadership Questionnaire (MLQ) (Bass & Avolio, 2004). The MLQ methodology for research of the styles and outcomes of leadership was widely used in different studies in the previous period (Den Harotg et al., 1997; Muenjohn & Armstrong, 2008; Moreno-Casado et al., 2021). This methodology comprises three leadership styles (passive, transactional, and transformational) and three leadership outcomes (efficiency, extra effort, and satisfaction). "This survey consists of 36 items related to leadership styles and 9 items that are related to leadership outcomes. To assess the frequency of the observed managerial behavior, a five-point Likert´s evaluation scale was used (adjusted: 1=strongly disagree, 2=partially disagree; 3=not sure, 4=partly agree, 5=agree)" (Berber et al., 2019, p. 172). Also, the MLQ methodology is widely used in the banking sector to analyze leadership styles (Asrar-ul-Haq & Kuchinke, 2016; Dartey-Baah & Mekpor, 2017; Berber et al., 2019).

The authors of the paper analyzed data from a sample of 140 managers from the banking sector of the Republic of Serbia. "The data were gathered in the period from November 2018 to February 2019. The authors sent out 500 questionnaires to the banking sector (private banks), to examine the leadership styles of the managers at the middle and senior levels. There were 154 questionnaires filled out and returned and after a checking process, 140 of them were used in the analysis. The response rate was 28%" (Berber et al., 2019, p. 172-173).

The authors used the SPSS program 21.0 version for data analysis.

Table 1: Sample of the research (N=140)

Sex	**Frequency**	**Percent**	**Valid Percent**
Male	84	60.0	60.0
Female	56	40.0	40.0
Total	140	100.0	100.0
Age	**Frequency**	**Percent**	**Valid Percent**
18-25	19	13.6	13,6
26-34	55	39.3	39.3
35-45	45	32.1	32.1
46-55	18	12.9	12.9
56+	3	2.1	2.1
Total	140	100.0	100.0
Education	**Frequency**	**Percent**	**Valid Percent**
Business school	43	30.7	30.7
Bachelor	38	27.1	27.1
Graduated (4 years)	26	18.6	18.6
MSc/PhD	33	23.6	23.6
Total	140	100.0	100.0

Source: the authors' research.

According to the data in Table 1, the sample of this research consists of 60% of male and 40% of female respondents, where most of them (39.3%) are from 26 up to 35 years old, followed by people in the age group from 36-45 (32.1%). Regarding educational level, most of the respondents possess business school and bachelor's degrees (30.7 and 27.1%, respectively). There are 18.6% of respondents that possess a diploma after 4 years of study, and 23.6% of them with master and Ph.D. diplomas.

3. Results

The first part of the results presents the reliability analysis. According to the data in table 2, Cronbach's Alpha Based on Standardized Items is 0.894, which means that the items in the questionnaire have high internal consistency. We took only 36 questions related to leadership styles into the analysis (the full MLQ has 45 questions in total, 36 for leadership styles, and 9 for leadership outcomes).

Table 2: Reliability statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.889	.894	36

Source: the authors' research based on Berber et al., 2019.

The second part of the analysis was dedicated to the investigation of the relations between age and education of respondents and their leadership styles. The authors used regression models to investigate the proposed relations. Multicollinearity, which often occurs in the analyses due to variables' high inter-correlations (Berber et al., 2019), was analyzed. The model achieved no multicollinearity since the VIF coefficients were lower than 3.0.

According to the data in Table 3, the value of R for the first model (where the dependent variable was transformational leadership style) of 0.703 indicates a good level of

prediction. The coefficient of the determination, R square, is 0.494 which means that the model explains 49.4% of the variance of transformational style. The basic model was significant (F(3,136)=44.188, p<0,000).

Table 3: Model 1 summary

Model	R	R 2	Adjusted R square	Change statistics				
				R Square change	F Change	df1	df2	Sig. F Change
1	.703[a]	.494	.482	.494	44.188	3	136	.000
a. Predictors: (Constant), Educ, Sex, Age								
b. Dependent variable: TF								

Source: the authors' research.

According to the data presented in Table 4, the first model is statistically significant. The F-ratio in the table showed that the regression model is a good fit for the data. The independent variables in the model statistically predict the dependent variable in the case of transformational leadership F(3, 136) = 44.188, p<0,000.

Table 4: Model 1 ANOVA

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	81.000	3	27.000	44.188	.000[b]
	Residual	83.100	136	.611		
	Total	164.099	139			
a. Dependent variable: TF						
b. Predictors: (Constant), Educ, Sex, Age						

Source: the authors' research.

Based on the results of the regression model with transformational style as the dependent variable, age and education level of leaders are statistically significantly related to the transformational leadership style. According to the positive beta coefficient, the higher level of education that leaders have is positively related to the transformational leadership style (β=0.596, p<0.000). A higher number of years of the life of leaders in the sample showed negative statistically significant relations to the transformational leadership style (β =-0.161, p<0.05).

Table 5: Model 1 coefficients

Model		Unstandardized coefficients		Standardized coefficients	t	Sig.	Collinearity statistics	
		B	Std. error	Beta			Tol.	VIF
1	(Constant)	1.601	.357		4.480	.000		
	Sex	.065	.136	.030	.480	.632	.978	1.022
	Age	-.161	.070	-.141	-2.282	.024	.971	1.030
	Educ	.596	.055	.673	10.896	.000	.977	1.024
a. Dependent variable: TF								

Source: the authors' research.

According to the data in Table 8, the value of R for the second model (where the dependent variable was transactional leadership style) of 0.575 indicates a good level of

prediction. The coefficient of the determination, R square, is 0.330 which means that the model explains 33% of the variance of transactional style. The basic model was significant (F(3,136)=22.360 p<0.000).

Table 6: Model 2 summary

Model	R	R 2	Adjusted R square	Change statistics				
				R Square change	F change	df1	df2	Sig. F change
1	.575[a]	.330	.316	.330	22.360	3	136	.000
a. Predictors: (Constant), Educ, Sex, Age								
b. Dependent variable: TS								

Source: the authors' research.

The second model is statistically significant as well. The F-ratio in the table showed that the regression model is a good fit for the data. The independent variables in the model statistically predict the dependent variable in the case of transactional leadership style F(3, 136) = 22.360, p<0.000.

Table 7: Model 2 Anova

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	37.757	3	12.586	22.360	.000[b]
	Residual	76.551	136	.563		
	Total	114.308	139			
a. Dependent variable: TS						
b. Predictors: (Constant), Educ, Sex, Age						

Source: the authors' research.

Based on the results of the regression model given in table 8, only the education level of leaders has statistically significant relations to the transactional leadership style. According to the positive beta coefficient, the higher level of education that leaders have is positively related to the transactional leadership style (β=0.409, p<0.000).

Table 8: Model 2 coefficients

Model		Unstandardized coefficients		Standardized coefficients	t	Sig.	Collinearity statistics	
		B	Std. error	Beta			Tol.	VIF
1	(Constant)	2.143	.343		6.250	.000		
	Sex	.024	.131	.013	.180	.858	.978	1.022
	Age	-.097	.068	-.102	-1.437	.153	.971	1.030
	Educ	.409	.052	.554	7.806	.000	.977	1.024
a. Dependent variable: TS								

Source: the authors' research.

According to the data in Table 9, the value of R for the third model (where the dependent variable was passive leadership style) of 0.534 indicates a good level of prediction. The coefficient of the determination, R square, is 0.285 which means that the model explains 28.5% of the variance of passive style. The basic model was significant (F(3,136)=18.062, p<0.000).

Table 9: Model 3 summary

Model	R	R 2	Adjusted R Square	Change statistics				
				R Square change	F change	df1	df2	Sig. F change
1	.534[a]	.285	.269	.285	18.062	3	136	.000
a. Predictors: (Constant), Educ, Sex, Age								
b. Dependent variable: PS								

Source: the authors' research.

The third model is statistically significant since the F-ratio in Table 10 showed that independent variables in the model statistically predict the dependent variable in the case of passive leadership style F(3, 136) = 18.062, p<0,000.

Table 10: Model 3 ANOVA

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	37.354	3	12.451	18.062	.000[b]
	Residual	93.754	136	.689		
	Total	131.108	139			
a. Dependent variable: PS						
b. Predictors: (Constant), Educ, Sex, Age						

Source: the authors' research.

Based on the results of the regression model 3 in Table 11, the age and education level of leaders are statistically significantly related to the passive leadership style. According to the negative beta coefficient, the higher level of education that leaders have is negatively related to the passive leadership style (β=-0.392, p<0.000). A higher number of years of the life of leaders in the sample showed positive statistically significant relations to the passive leadership style (β =0.152, p<0.05).

Table 11: Model 3 coefficients

Model		Unstandardized coefficients		Standardized coefficients	t	Sig.	Collinearity statistics	
		B	Std. error	Beta			Tol.	VIF
1	(Constant)	3.832	.379		10.098	.000		
	Sex	-.043	.145	-.022	-.296	.768	.978	1.022
	Age	.152	.075	.150	2.034	.044	.971	1.030
	Educ	-.392	.058	-.495	-6.753	.000	.977	1.024
a. Dependent variable: PS								

Source: the authors' research.

Discussion and conclusion

Based on the conducted research, both theoretical and empirical, we can conclude that demographic factors make a different influence on leadership styles in the banking sector in Serbia. In this sample, gender did not have any statistically significant effect on transformational, transactional, and passive leadership styles. This is the opposite result to previous researches made in the world (Carless, 1998; Van Engen & Willemsen, 2004;

Stempel et al., 2015), and it is a kind of a "black box" that should be investigated in future research on this theme. In the case of age, we found effects on transformational and passive styles, where older managers practiced less transformational and more passive styles. This follows the results of Kara et al. (2018) and Gemeda and Lee (2020), and it can be concluded that older managers are more related to passive and transactional styles, while younger are positively related to transformational. Regarding educational level, as expected, we found that more educated managers perform more transformational than less educated managers. This is following the idea that persons who possess more knowledge, skills, and abilities can handle different challenges and risks more efficiently, especially when human resources are in question. This finding is in the line with the previous study of Barbuto et al. (2007).

The question whether men and women, more or less educated, or older people lead differently has been important theme in managerial science and practice. Demographic variables such as gender, age, and educational level could be used to predict managerial behaviors, like communication style, decision making, productivity, participation, conflict style, and power (Barbuto et al., 2007). These predictions are even more important in modern turbulent business environment, when organizations need to possess capable managers that would be successful in reaching organizational goals and making sustainability for their organizations. This was the main motivation for the proposed research in this paper.

The present research provides practical implications in terms of valuable information for managers regarding their leadership behaviors, especially when the education level is in question. Managers who want to become successful leaders need to invest in themselves in terms of lifelong learning and continuous improvements of their leadership practices. Modern business conditions are a great challenge for all, and therefore, people who are leading others need to be prepared and capable to solve problems, generate new ideas, and motivate their followers to achieve new value, which would become a source for competitive advantage.

Theoretical implications of the paper lie in new evidence on the relations between demographic factors and leadership styles. As mentioned in the theoretical background of the paper, there is not enough evidence on these effects, and therefore, this research can decrease the gap in the literature.

Limitations of the research are related to the sample. 140 managers are not a representative sample, but the study showed the main effects. Future research should be based on a larger sample, with more details on demographic factors and additional analysis to investigate the differences in leadership styles.

References

Alghamdi, M. G., Topp, R., & AlYami, M. S. (2018). The effect of gender on transformational leadership and job satisfaction among Saudi nurses. *Journal of Advanced Nursing, 74*(1), 119-127. Doi: https://doi.org/10.1111/jan.13385

Asrar-ul-Haq, M., & Kuchinke, K. P. (2016). Impact of leadership styles on employees' attitude towards their leader and performance: empirical evidence from Pakistani banks. *Future Business Journal, 2*(1), 54-64. Doi: https://doi.org/10.1016/j.fbj.2016.05.002

Barbuto, J. E., Fritz, S. M., Matkin, G. S., & Marx, D. B. (2007). Effects of gender, education, and age upon leaders' use of influence tactics and full range leadership behaviors. *Sex Roles, 56*(1), 71-83. Doi: https://doi.org/10.1007/s11199-006-9152-6

Bass, B. M., Avolio, B. J., & Atwater, L. (1996). The transformational and transactional leadership of men and women. *Applied Psychology, 45*(1), 5-34. Doi: https://doi.org/10.1111/j.1464-0597.1996.tb00847.x

Bass, B., & Avolio, B. (2004). *Multifactor Leadership Questionnaire Manual (Third Edition)*. Menlo Park, CA: Mind Garden, Inc.

Berber, N., Slavić, A., Miletić, S., Simonović, Z., & Aleksić, M. (2019). A survey on relationship between leadership styles and leadership outcomes in the banking sector in Serbia. *Acta Polytechnica Hungarica, 16*(7), 167-184. Doi: https://doi.org/10.12700/APH.16.7.2019.7.10

Berendt, C. J., Christofi, A., Kasibhatla, K. M., Malindretos, J., & Maruffi, B. (2012). Transformational leadership: lessons in management for today. *International Business Research, 5*(10), 227-232.

Birasnav, M. (2014). Knowledge management and organizational performance in the service industry: the role of transformational leadership beyond the effects of transactional leadership. *Journal of Business Research, 67*(8), 1622-1629. Doi: https://doi.org/10.1016/j.jbusres.2013.09.006

Bjekić, R. (2021). *Veza između komponenti emocionalne inteligencije, liderstva i radne angažovanosti zaposlenih u poslovnom ambijentu Republike Srbije. Doktorska disertacija*. Subotica: Ekonomski fakultet u Subotici.

Bjekić, R., & Strugar-Jelača, M. (2020). The role of transformational leadership in R&D projects teams: the proposal of the research framework. *Ekonomski pogledi, 22*(2), 109-123. Doi: https://doi.org/10.5937/EkoPog2002109B

Bjekić, R., Rodić, M., Aleksić, M., & Gašić, D. (2021). Relationship between social competences of manager and leadership outcomes. *Ekonomika, 67*(2), 47-57. Doi: https://doi.org/10.5937/ekonomika2102047B

Bozkurt, O., & Goral, M. (2014). The assessment of modern leadership styles in relation with demographic factors. *Research Journal of Business and Management, 1*(3), 169-179.

Carless, S. A. (1998). Gender differences in transformational leadership: an examination of superior, leader, and subordinate perspectives. *Sex Roles, 39*(11), 887-902.

Costache, A. (2018). Transformational leadership in Romania's education system: preliminary results. *Romanian Journal of Psychological Studies (RJPS)*, 3-12.

Dartey-Baah, K., & Mekpor, B. (2017). Emotional intelligence: Does leadership style matter? Employees' perception in Ghana's banking sector. *International Journal of Business, 22*(1), 41-54.

Gardašević, J., Ćirić, M., & Stanisavljević, I. (2021). The relations between contemporary leadership styles and the dimensions of national culture in modern business environment. *Ekonomika, 67*(1), 77-89. Doi: https://doi.org/10.5937/ekonomika2101077G

Gemeda, H. K., & Lee, J. (2020). Leadership styles, work engagement and outcomes among information and communications technology professionals: a cross-national study. *Heliyon, 6*(4), e03699. Doi: https://doi.org/10.1016/j.heliyon.2020.e03699

Josipović, M., Tepavčević, J., & Šimon, V. (2020). Sociodemographic characteristics and stress: the case of housekeeping and front office employees. *Menadžment u hotelijerstvu i turizmu*, 8(2), 53-63. Doi: https://doi.org/10.5937/menhottur2002053J

Kara, D., Kim, H. L., Lee, G., & Uysal, M. (2018). The moderating effects of gender and income between leadership and quality of work life (QWL). *International Journal of Contemporary Hospitality Management, 30*(3), 1419-1435. Doi: http://dx.doi.org/10.1108/IJCHM-09-2016-0514

Koo, H., & Park, C. (2018). Foundation of leadership in Asia: leader characteristics and leadership styles review and research agenda. *Asia Pacific Journal of Management, 35*(3), 697-718. Doi: https://doi.org/10.1007/s10490-017-9548-6

Mohammed, K. A., Othman, J., & D'Silva, J. L. (2012). Social demographic factors that influence transformational leadership styles among top management in selected organizations in Malaysia. *Asian Social Science, 8*(13), 51.

Moreno-Casado, H., Leo, F. M., López-Gajardo, M. A., García-Calvo, T., Cuevas, R., & Sánchez-Oliva, D. (2021). Adaptation and validation of the MLQ-5X Leadership Scale to the Spanish educational context. *Anales de Psicología, 37*(2), 311-322. Doi: https://doi.org/10.6018/analesps.425351

Muenjohn, N., & Armstrong, A. (2008). Evaluating the structural validity of the multifactor leadership questionnaire (MLQ), capturing the leadership factors of transformational-transactional leadership. *Contemporary Management Research, 4*(1), 3-14. Doi: https://doi.org/10.7903/cmr.704

Muterera, J., Hemsworth, D., Baregheh, A., & Garcia-Rivera, B. R. (2018). The leader–follower dyad: the link between leader and follower perceptions of transformational leadership and its impact on job satisfaction and organizational performance. *International Public Management Journal, 21*(1), 131-162. Doi: https://doi.org/10.1080/10967494.2015.1106993

Ng, E. S., & Sears, G. J. (2012). CEO leadership styles and the implementation of organizational diversity practices: moderating effects of social values and age. *Journal of Business Ethics, 105*(1), 41-52. Doi: https://doi.org/10.1007/s10551-011-0933-7

Oc, B. (2018). Contextual leadership: a systematic review of how contextual factors shape leadership and its outcomes. *The Leadership Quarterly, 29*(1), 218-235. Doi: https://doi.org/10.1016/j.leaqua.2017.12.004

Oshagbemi, T. (2004). Age influences on the leadership styles and behaviour of managers. *Employee Relations*, 26(1), 14-29. Doi: https://doi.org/10.1108/01425450410506878

Poels, J., Verschueren, M., Milisen, K., & Vlaeyen, E. (2020). Leadership styles and leadership outcomes in nursing homes: a cross-sectional analysis. *BMC Health Services Research, 20*(1), 1-10. Doi: https://doi.org/10.1186/s12913-020-05854-7

Rodić, M., & Marić, S. (2021). Leadership style and employee readiness: basic factors of leadership efficiency. *Strategic Management, 26*(1), 53-65. Doi: https://doi.org/10.5937/StraMan2101053R

Rowold, J., & Heinitz, K. (2007). Transformational and charismatic leadership: assessing the convergent, divergent and criterion validity of the MLQ and the CKS. *The Leadership Quarterly, 18*(2), 121-133. Doi: https://doi.org/10.1016/j.leaqua.2007.01.003

Sarıköse, S., & Türkmen, E. (2020). The relationship between demographic and occupational variables, transformational leadership perceptions and individual innovativeness in nurses. *Journal of Nursing Management, 28*(5), 1126-1133. Doi: https://doi.org/10.1111/JONM.13060

Shadare, O. A. (2011). Management style and demographic factors as predictors of managerial efficiency in work organizations in Nigeria. *International Business & Economics Research Journal (IBER), 10*(7), 85-94. Doi: https://doi.org/10.19030/iber.v10i7.4669

Sid, S. (2019). The traits of transactional leadership: "I" not "We". *101Productivity*. Retrieved 19/09/2021 from https://101productivity.com/traits-of-a-transactional-leader/

Silva, D. A. C. S., & Mendis, B. A. K. M. (2017). Male vs. female leaders: analysis of transformational, transactional & laissez-faire women leadership styles. *European Journal of Business and Management, 9*(9), 19-26.

Simić, I. (2020). Are managers and leaders one and the same?. *Ekonomika, 66*(3), 1-13. Doi: https://doi.org/10.5937/ekonomika2003001S

Stempel, C. R., Rigotti, T., & Mohr, G. (2015). Think transformational leadership – think female?. *Leadership, 11*(3), 259-280. Doi: https://doi.org/10.1177%2F1742715015590468

Strugar Jelača, M., Bjekić, R., & Leković, B. (2016). A proposal for research framework based on the theoretical analysis and practical application of MLQ questionnaire. *Economic Themes, 54*(4), 549-562. Doi: https://doi.org/10.1515/ethemes-2016-0028

Strugar Jelača, M., Milićević, N., Bjekić, R., & Petrov, V. (2020). The effects of environment uncertainty and leadership styles on organisational innovativeness. *Engineering Economics/Inžinerinė ekonomika, 31*(4), 472-486. Doi: https://doi.org/10.5755/j01.ee.31.4.20948

Tasić, I., Merdović, M., Jankov, J., Terek, E., Jovanović, Z., & Nikolić, M. (2020). Liderstvo, LMX i kvalitet nastavnog procesa u osnovnim školama. *Anali Ekonomskog fakulteta u Subotici,* 43, 31-48. Doi: https://doi.org/10.5937/AnEkSub2001031T

Van Engen, M. L., & Willemsen, T. M. (2004). Sex and leadership styles: a meta-analysis of research published in the 1990s. *Psychological Reports, 94*(1), 3-18. Doi: https://doi.org/10.2466/pr0.94.1.3-18

Vinkenburg, C. J., Van Engen, M. L., Eagly, A. H., & Johannesen-Schmidt, M. C. (2011). An exploration of stereotypical beliefs about leadership styles: is transformational leadership a route to women's promotion?. *The Leadership Quarterly, 22*(1), 10-21. Doi: https://doi.org/10.1016/j.leaqua.2010.12.003

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The specific role of transformational leadership in the organizational culture of service organizations

Специфична улога трансформационог лидерства у организационој култури услужних организација

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Abstract: Transformational leadership links creative thinking, persistence and energy, intuition and the sense for people's need for organizational culture. It strives for innovation and expresses the sense for vision and meaning. Literature analysis in this field is followed by the research that examines transformational leadership and its coherence with an organisational culture in the international service company operating in Serbia. The participants in his research have perceived the role culture as primary, particularly the culture of rules and procedures. This culture is suitable to people that expect security at work, which could be the main goal in the particular company, having in mind that work instability and insecurity have been a common denominator in the past three decades. However, if a company wants to be innovative, it would have to put more effort into transformational leadership that could not be thoroughly examined in this study. Suggestions for further investigation are given at the end of this study, lack of instruments for investigations are pointed out, with an idea for improvements.
Keywords: leadership stiles, transformational leadership, organizational culture, typography of organizational culture, service organization
JEL classification: M11, O14

Сажетак: Трансформационо лидерство повезује креативно размишљање, упорност, енергију, интуицију и осећај који је потребан људима за организациону културу. Оно тежи иновацијама и изражава осећај за визију и смисао. Након анализе литературе у овој области, следи истраживање које испитује трансформационо лидерство и његову кохеренцију са организационом културом у међународној услужној компанији на територији Србије. Учесници у овом истраживању улогу културе схватили су као примарну, нарочито културу правила и процедура. Ова култура погодна је за људе који очекују сигурност на послу, што би могао бити главни циљ конкретне компаније, имајући у виду да су нестабилност и несигурност на послу били заједнички именилац у последње три деценије. Међутим, ако компанија жели бити иновативна, морала би уложити више напора у трансформационо лидерство које се не може детаљно испитати у овој

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студији. Предлози за даља истраживања дати су на крају ове студије, указано је на недостатак инструмената за истраживање, са идејом за побољшања.
Кључне речи: стилови лидерства, трансформационо лидерство, организациона култура, типографија организационе културе, услужна организација
ЈЕЛ класификација: M11, O14

Introduction

Theory of transformational leadership is one of the most popular theories today in the field of leadership theory. In many studies, transformational leadership was praised for its superior and positive relationship with subordinates, their satisfaction, efficiency, motivation, dedication and an assessment of leader's effectiveness through transformational leadership. This type of leadership is based on intangible goals such as vision, sharing of values and ideas with the purpose of developing relationships in the organization, giving meanings to the personal/individual activities and adapting a common base of followers in a changing environment. Above all, transformational leadership is based on personal moral values, believes and leaders quality rather than the exchange process between a leader and a follower (which is promoted in transactional leadership). Organizational culture development is leadership conditioned when leadership development could be caused by organizational culture. For example, transactional leaders work in their companies respecting rules, regulations, procedures, norms while transformational leaders tend to change an organizational culture by understanding it and harmonizing it with a new vision, supplemented by shared assumptions, values and norms (Bass, 1985). Modern companies have to develop an organizational culture that supports the establishment of work/life balance of employees and managers (Mladenović & Krstić, 2021). Effective organizations need strategic thinking as well as the creation of organizational culture by their leaders. Strategic thinking helps in building and developing of the company vision. Vision appears and moves on with the leader's creation of an organizational culture which supports this vision. Vision, in turn, can determine the characteristics of organizational culture.

There are two types of leaders in companies – formal and informal – and, when this is taken into account, the connection between managers and formal leaders and managers and informal leaders is not identical, thus, a manager is not the same as a leader (Simić, 2020). Transformational leaders are described through 4 main characteristics called "4I" of the transformational leadership. "4I" is presented as follows: (1) idealized influence (charisma); (2) inspirational motivation; (3) intellectual stimulation; (4) individualized consideration. There is a significant relationship between the level of social competencies of managers and the results of leadership, and emotional intelligence is an extremely important factor that leads to top results of leadership (Bjekić et al., 2021).

Transformational leaders connect creative thinking, persistence, energy, intuition and the sense for need of others for organizational culture. In reality, comparing the transformational and the transactional leadership culture that strives for innovations, the advantage is given to transformational leadership, where a leader builds a culture on

assumptions such as: people are reliable and decisive, each person have/creates unique contribution and impact, and complex problems are solved at the lowest possible level.

There is a constant interaction between culture and leadership. Culture influences leadership more than leadership can influence culture. Taking into account the extensive literature in the field of leadership and organizational culture, in the world, and the under-researched above mentioned subjects by Serbian students, in companies i.e. in practice, this study will theoretically analyse transformational leadership and organizational culture, and then present research on transformational leadership in a multinational service company operating in the Republic of Serbia. At the end of the study, the obtained statistical results will be interpreted and corrective actions and directions for further research will be proposed. Likewise, one study in the field of teaching showed that all dimensions of leadership, as well as all aspects of LMX relationships, have a statistically significant and positive impact on the teaching process, as well as on the ethical and personal development of students, and the strongest influences are those dimensions that include activities outside the classroom (Tasić et al., 2020).

1. Organizational culture

The concept of organizational culture has evolved over the last twenty-five years. This period was marked by a large number of books, articles and authors' works on this topic, with the aim of shedding light on the phenomenon of organizational culture, understanding the principles of its emergence, development and influence on the successful business of an organization. Building qualitative organizational culture has been claimed as an important element of organizational success in the business world. There is not a single unique definition of organizational culture. By examining extensive literature of organizational culture and utilizing many of scientific and research articles, we can present organizational culture through the following definitions.

Organizational culture can be defined as the pattern of basic assumptions that a given group has invented, discovered and developed in learning to cope with its problems of external adaptation and internal integration, and that have worked well enough to be considered valid, and, therefore to be taught to new members as the correct way to perceive, think, and feel in relation to these problems (Schein, 1984). Thus, organizational culture is a set of collective values, beliefs and practices of employees, a product of factors such as history, size of organization, strategy, management style, national cultures and other factors (Needle, 2004). However, corporate culture refers to culture deliberately created by management to meet strategic goals. Cultural differences manifest themselves in several ways. From the many terms used to describe manifestations of culture, the following four together cover the total concept rather neatly: symbols, heroes, rituals and values. The most cited typology of cultures mentioned in the literature is Harrison's, later modified and perfected by Handy. According to this classification there are four basic types of culture (Handy, 1993): (1) power culture; (2) role culture; (3) task culture; (4) person culture.

Charles Handy designed 15 dimensions, explained in the form of 15 items: the type of „boss"; the type of „well-behaved subordinate"; the way of determining company's priorities by its employee; the type of employee promoted within the organization; the way the organization treats its members; exerting control and influence within the organization; task distribution; employee motivation in accomplishing tasks; teamwork; team competition; dealing and managing conflicts; decision making; communication and control structure within the organization; ways of responding to external environment. The readiness of employees depends to a large extent on management efficiency and styles (Rodić & Marić, 2021).

The essence of power culture is orientation towards the leader, and the organization is a means of achieving the goals in the hands of the leader. Here, the leader makes the selection of people, and the selection of the right people leads to success. The advantages of this culture are its reliability and efficiency, but its disadvantages are its inability to adapt to change and lack of initiative. The disadvantage of this culture is that the size of the organization cannot be increased indefinitely; superficiality arises because there is no time to develop expertise in employees, and employees are too dependent on their own qualities.

2. Transformational leadership

In order to analyse the concept of transformational leadership, it is necessary to first look at different approaches to leadership as well as to study leadership styles. Leadership approaches are: (1) line theory; (2) behavioural theories; (3) situational theories; (4) charismatic leadership theory (transformational and transactional leaders are discussed).

Transformational leadership consists of four elements (Bass, 1998): (1) charisma or idealized (a leader is charismatic if his or her followers seek to identify with or imitate him); (2) inspirational motivation (motivate and inspire followers by providing meaning and challenge in their business); (3) intellectual stimulation (Intellectually stimulating leadership seeks to increase the use of followers' potential and abilities); (4) individualized considerations (individual leader consideration focuses on followers' needs for achievement and growth).

A large number of studies find that follower commitment, loyalty, satisfaction, and commitment are linked to transformational leadership (Fullagar, McCoy, & Shull, 1992; Niehoff, Enz, & Grover, 1990; Pitman, 1993). Transformational leaders act as coaches and mentors to their subordinates, concentrating their efforts on long-term goals, emphasizing their vision (and inspiring subordinates to achieve the intended shared vision), encouraging their subordinates to take greater responsibility for the development of their subordinates and the development of all others (Avolio, Bass, & Jung, 1999; Bass, 1985; Bycio, Hackett, & Allen, 1995; Howell & Avolio, 1993). Transformational leadership has received much more attention since establishing the link between significant results such as employee job satisfaction and organizational performance (Trépanier, Fernet, & Austin, 2012).

A transformational leadership style (Kaslow, Falender, & Grus, 2012) reflects leadership traits, personality traits, and the capacity to elicit change and benefit for the team or organization through examples. Transformational leaders are trustworthy, respectful,

proud, and strong role models for ethical behaviour, articulating a vision in a way that motivates others to agree, challenges assumptions, and fosters and nurtures innovation and creativity. They are ready to personalize training and opportunities, perceive individual needs, celebrate success and act as mentors (Bass, 1985). Typically, transformational leaders are charismatic and visionary (Burns, 1978).

Charisma provides followers with a pure sense and purpose to strengthen. It is a role model for ethical behaviour and building identification with the leader and his or her stated vision. Contingent reward clarifies what is expected of followers and what they will receive if they reach the expected level of performance.

Leadership styles have proven to be one of the key components of an effective organization. As Drucker argues, the way a leader interacts with a team can determine how employees act (Drucker, 2003).

The Podsakoff Transformational Leadership Scale contains six transformational factors (Podsakoff et al., 1990): (1) defining a vision; (2) providing a suitable role model; (3) encouraging the acceptance of goals; (4) setting high expectations of achievement; (5) providing personal support; and (6) providing intellectual stimulation.

Transformational leadership that encompasses the creation of vision and inspiration has a significant impact on the creativity of followers because the leader motivates employees, shapes the organizational culture and creates the organizational climate necessary for organizational change (Weihrich, Cannice, & Koontz, 2010).

3. Research in the field of organizational culture and transformation leadership

When it comes to leadership and organizational culture, different results appear in the literature as their reciprocal relationship. The authors examined transformational leadership and organizational culture and their mutual influence on different organizations and different patterns.

An overview of the research and the results obtained by the scientists is presented below.

A group of authors (Norlina et al., 2015) explored the relationship between leadership styles (transformational and transactional) and organizational culture in financial institutions. The aim of their research was to identify which leadership style creates a quality organizational culture in financial institutions. For this examination, they used Bass and Avolio's multifactorial leadership questionnaire, Gary McKeown's questions regarding quality organizational culture, and the IFE matrix to determine the current work culture in the observed organizations. Certainly, researchers see the great role of both styles in forming a positive organizational culture.

Another group of authors (Nguyen et al., 2016) explored choices in management control system design by examining how transformational leadership styles influence the design choices of an advanced Comprehensive Performance Measurement System (PMS)

and how widespread computing with information (BSA) facilitates the managerial decision-making process and the result of managerial work. The results obtained suggest that the style of transformational leadership has a significant positive and direct effect on the result of managerial work.

In his research, Manal ElKordy (ElKordy, 2013) examines the extent to which transformational leadership and organizational culture influence employee attitudes, as well as the effect of job satisfaction on organizational commitment.

Imran et al. (2016) analysed the link between transformational leadership and organic learning. Transforming firms from a resource-based approach to a knowledge-based approach enhances the importance of organizational learning. A positive influence of transformational leadership was found on stimulating organizational learning in the banking sector of developing countries.

Abdullah, Shamsuddin, & Wahab (2019) explored the connection between organizational culture, transformational leadership and organizational commitment. Their study aimed to determine the effect of organizational culture on the link between transformational leadership and organizational commitment among small business employees. The results showed that organizational culture has no mediating effect of transformational leadership on organizational commitment in small business.

Szczepanska-Woszczyna (2015) explored the impact of leadership on organizational innovation. Her study examined the link between organizational culture, leadership and innovation. The research was conducted in Poland on private companies. The results of the research confirmed the same as the theory that transformational leadership is linked to organizational culture and innovation.

According to Jaber (2015), some fundamental culture values are found in the knowledge base of the Palestinian social culture. There is also a reflection of the values on teacher's classroom practices and on the effect of those practices on student's cultural identity in the context from a cultural perspective. In the paper, the author used Hofstede's cultural framework. After the research author agreed with Hofstede that cultural dimensions constitute another important component of culture in addition to cultural norms.

According to Liu & Lee (2019), once an innovation climate and transformational leadership are developed, the employee will consciously feel that he or she is a significant part of the organization and will become relatively more willing to devote more time and effort to searching for new service or process improvements to satisfy customers' changing needs.

4. Research methodology

In order for an organization to be successful in modern business and the challenges that come with a modern business, it is necessary to pay attention to organizational culture and its connection to transformational leadership. Key values that would be manifested by employees, in such a case, would be adaptability, joint cooperation, commitment, effective communication, empowerment, flexibility, good organization morale, professionalism, trust,

continuous improvement of quality of work and respect. Transformational culture must fit Model "4I" (charisma-idealized influence, inspirational motivation, intellectual stimulation, and individual considerations) and then there is a general sense of purpose and sense of family within the company.

The objective of this research is to determine whether there is a correlation between transformational leadership and a specific organizational culture, and then to determine whether there is a difference in the expression of transformational leadership with respect to the age of the respondents in the organization, the level of education and the level in the organizational structure. The survey also looked at transformational leadership in respondents who, according to their commitment, belong to different types of organizational culture.

First of all, the goal of the research is to determine whether there is a transformational leadership in the company and in what way it is connected with the specific organizational culture, how the organizational culture is seen by the employees in the company, with the ultimate aim of identifying possible deficiencies and giving management suggestions for future improvements.

The research hypothesis

Main hypothesis - Transformational leadership show positive relationship with the specific organizational culture – role culture.

Specific hypothesis:

H1 - There are no age differences in transformational leadership;

H2 - There is a statistically significant differences in transformational leadership between employees with different educational levels, whereas employees of higher levels of education show higher transformational leadership

H3 - There is a statistically significant difference in transformational leadership between employees who perform different types of work, with higher levels of transformational leadership answered by employees in managerial positions compared to employees on the lowest organization's level.

H4 - There is a statistically significant difference in transformational leadership between respondents who have shown belonging to different types of organizational culture.

Instrument

The Transformational Leadership Scale has 5 items. Preliminary item analysis showed that one item (No. 1) had a strikingly low corrected item-total correlation; thus, its exclusion increases the reliability of the scale (from .69 to .78). The corrected item-total correlations of the remaining items are good in a range from .37 to .73.

The organizational culture questionnaire was used to operationally define the organizational culture variable (Handy, 1993). The questionnaire was defined based on Harrison's Organizational Ideologies Questionnaire (1972), whose typology inspired Handy in his work on the topic of organizational culture. The author assumes that this questionnaire measures four types of organizational culture, namely: power culture, role culture, task

culture, and person culture. Charles Handy assumed 15 dimensions operationally defined using 15 items.

This study used 8 dimensions that were assumed to be most relevant: the type of superior, the type of good subordinate, the way of prioritizing within the company, the way of determining employee success, the way to exercise control and influence in the organization, the way to motivate employees, make decisions, manage conflicts.

Four answers were offered for each dimension. The first answer corresponds to organizational culture oriented to the power, the second answer corresponds to organizational culture oriented to the role, the third answer corresponds to organizational culture oriented to the task and the fourth answer corresponds to organizational culture oriented to interpersonal support. Respondents were asked to pick one of the four offered answers. Each respondent's response is scored individually, in order to gain insight into the individual results, that is, how each respondent perceives the existing organizational culture within the company in which he or she is employed.

The questionnaire used to examine transformational leadership was developed by the authors. The questionnaire consists of 5 items, based on the theoretical framework of transformational leadership. The questions were answered in the form of a five-point Likert-type scale, with the degrees offered indicating the level of agreement with the given statement (1- not at all true, 2 - mostly not true, 3 - not sure, 4 - mostly true, 5 - quite exactly).

Description of the sample

503 respondents employed in a service company operating in the territory of Serbia, are selected as a sample. The sample is made up of employees who were available in the workplace at the time of the survey. Approximately 92% of the sample consists of employees-operators, while employees in managerial positions make up the remaining 8% of the sample. The structure of the whole sample with respect to socio-demographic variables is presented in Tables 1, 2 and 3.

Table 1: Age

		Frequency	Percent	Valid percent	Cumulative percent
Valid					
	Until 25	58	11,5	11,5	11,5
	26-35	204	40,6	40,6	52,1
	36-45	157	31,2	31,2	83,3
	46 and more	84	16,7	16,7	100
	Total	503	100	100	

Source: the authors' interpretation

Table 2: Education

	Frequency	Percent	Valid percent	Cumulative percent
Valid				
Primary school	42	8,3	8,3	8,3
Secondary school (3 grade)	231	45,9	45,9	54,3
Secondary school (4 grade)	199	39,6	39,6	93,8
Bachelor and Master	31	6,2	6,2	100
Total	503	100	100	

Source: the authors' interpretation

Table 3: Working place/Current job position

	Frequency	Percent	Valid percent	Cumulative percent
Valid				
Worker/Terminal agent	459	91,3	91,3	91,3
Fore-worker	23	4,6	4,6	95,8
Middle and top management	21	4,2	4,2	100
Total	503	100	100	

Source: the authors' interpretation

5. Discussion

Transformational leadership is associated significantly only with task culture, with low correlation intensity and positive (Table 4).

The main trust of task culture is success and achievement. The obtained result of the connection between transformational leadership and task culture in the observed company is clear because the company from small became big in a short period of time and the characteristics of organizational culture inherent in small companies were retained. The problem may arise because it is difficult to maintain a task culture in a large company, because there may be a superficiality due to the inability to monitor the development of each employee whose success depends largely on their own qualities.

Table 4: Descriptive statistics and correlation between variables

	Transformational leadership	Power culture	Role culture	Task culture	Person culture
Transformational leadership	1				
Power culture	-0.01	1			
Role culture	-0.07	-0.48***	1		
Task culture	0.15***	-0.28***	-0.51***	1	
Person culture	-0.08	-0.20***	-0.17***	-0.15***	1
M	13.80	1.96	3.39	1.87	0.50
SD	4.03	1.16	1.36	1.10	0.68

Source: the authors' interpretation

Based on the variance analysis for repeated measurements, it was shown that there were significant differences in the expression of the four types of cultures ($F(3,500) = 819.79$, $p < .001$). Post hoc Bonferroni tests showed that there were significant differences between all cultures, except between the culture of power and the culture of the task, which were equally expressed in the sample ($p = 1.00$). Thus, role culture is the most pronounced, then cultures of power and task, and person culture is the least pronounced.

No significant age differences were obtained in transformational leadership ($F(3,499) = 0.11$, $p = .96$). In terms of educational background, there were significant differences in transformational leadership ($F(3,499) = 3.86$, $p = .01$). The Bonferroni post hoc test showed that there were differences only between respondents with three years level and four years level of education ($p = .020$), with respondents with four years of school achieving higher scores on transformational leadership ($M = 14.29$, $SD = 3.65$) compared to respondents with three-year secondary school ($M = 13.15$, $SD = 4.39$). No significant differences were found in transformational leadership with respect to the performing job ($F(3,499) = 0.77$, $p = .46$).

Answering questions on organizational culture structure in relation to the dimension type of the "boss", which operationally defines the type of organizational culture through the dimension characterized by the superior type in the organization, respondents overwhelmingly expressed their opinion in favour of the task culture (33%), followed by the role culture (32%). Organizational culture structure in relation to dimension type of good subordinate, which operationally defines the type of organizational culture through the dimension characterized by the type of good subordinate in the organization, the respondents expressed the highest score for task culture (41%), followed by the role culture (35%). As for organizational culture structure in relation to the dimension of company prioritization determination, which operationally defines the type of organizational culture through a dimension characterized by the way of determining companies' priorities by their employees, respondents overwhelmingly voted for role culture (47%). When it comes to organizational culture structure in relation to the dimension of the employee performance determination, which operationally defines the type of organizational culture through the dimension characterized by the means of the employee performance determination, they overwhelmingly voted for role culture (46%). As regards organizational culture structure in relation to the dimension of exerting of implementation of the control and influence in the organization, which operationally defines the type of organizational culture through the dimension characterized by the means of implementation of the control and influence in the organization, the largest percentage voted for role culture (54%). When considering organizational culture structure in relation to the dimension of means of employee motivation, which operationally defines the type of organizational culture through a dimension characterized by the means of employee's motivation, most respondents voted for role culture (47%). In the observed organizations, the way of motivating employees is mostly described as follows: "His workplace is such that it needs to be controlled. Organizational culture structure in relation to the dimension content of decision making, which operationally defines the type of organizational culture through the dimension characterized by decision-making, the highest score was for the role culture (64%). In the observed organizations, the decision-maker is mostly described as follows: "The division of work and responsibility in

the system is determined to give tasks." Regarding organizational culture structure in relation to the dimension of conflict management, that operationally defines the type of organizational culture across the dimension characterized by the Conflict Management, respondents overwhelmingly voted for a culture of power (50%). In the observed organizations, conflict management is mostly described in the following manner: "Controlled by management".

Graphic presentation of organizational culture structure by all examined dimensions is shown in Figure 1.

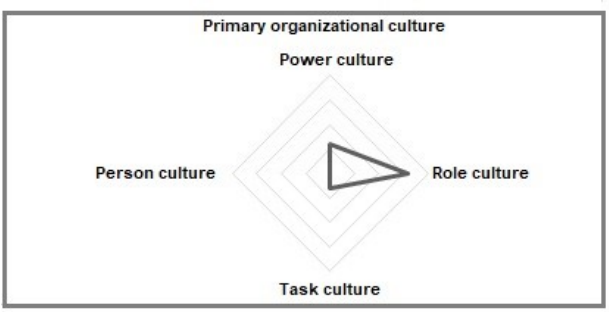
Figure 1: Organizational culture structure by all examined dimensions

Source: the authors' creation

In Figure 2, we can see that the results obtained on the dimensions of the type of superior and the type of good subordinate correspond to the type of task-oriented culture, whereas the results on other dimensions correspond to role-oriented culture. It is interesting to note that only in the dimension of conflict management, the result corresponds to a power-oriented culture.

Graphic presentation of the primary organizational culture structure is shown on the picture 2.

Figure 2: Primary organizational culture structure

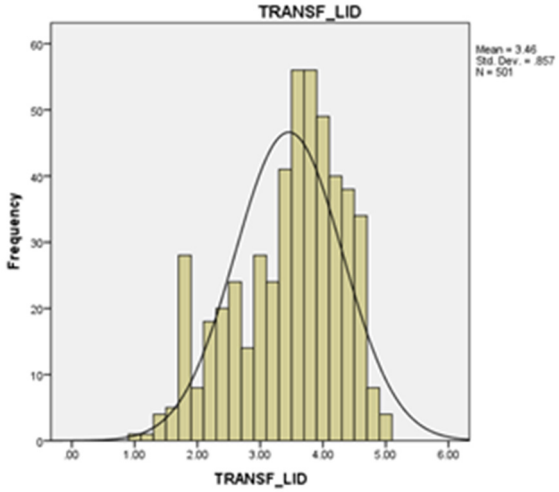


Source: the authors' creation

According to the results of the survey, we can observe that role culture is a type of organizational culture that is perceived as primary within the participant of this research.

Graphic presentation of transformational leadership responses with the indicated normal distribution curve is shown in Figure 3.

Picture 3: Transformational leadership responses with the indicated normal distribution curve



Source: the authors' creation

Conclusion

An analysis of the results lead to the conclusion that the main hypothesis - "Transformational leadership shows positive relationship with the specific organizational culture". Role culture is partly accepted because we have not received a clear link on the positive connection of transformational leadership with the type of organizational culture. In future research, it is

necessary to expand the transformational leadership instrument in order to get a clear picture of the relationship between transformational leadership and organizational culture. Considering that it is a company where more than 90% of the respondents are executors, it can be concluded that transformational leadership cannot be applied in the given organizational and that the results obtained are a true reflection of the situation in the enterprise.

Through 8 operationally defined organizational culture dimensions, employees' commitment to the type of organizational culture was observed, primarily for role culture. The fact that role culture has proven to be primary is not unusual because it is an organization where sample size was made 92% of employees from the lowest organizational level, the ultimate performers. The result obtained was therefore to be expected because, as stated, executives do not have much space for creativity but clearly defined job descriptions. The proposal is for each employee to be given the opportunity to participate, where good ideas would be valued and good ideas would come because no one knows the possibility of promotion in the workplace better than the employee himself.

All the obtained results indicate that there is a need to continue research in the field of transformational leadership and the type of organizational culture relationship, which is at the same time a proposal by the author to scholars to pursue future research in this field on the territory of Serbia. Furthermore, the research should be continued in specific service organizations such as health organizations, culture organizations, educational organizations, insurance organizations, sport organizations, construction etc., enabling future researchers to conclude if there are any discrepancies with the results obtained in this research.

References

Abdullah, N. H., Shamsuddin, A., & Wahab, E. (2015). Does organizational culture mediate the relationship between transformational leadership and organizational commitment? *International journal of organizational leadership*, *4*, 18-32.

Avolio, B. J., Bass, B. M., & Jung, D. I. (1999). Re-examining the components of transformational and transactional leadership using the Multifactor Leadership Questionnaire. *Journal of Occupational and Organizational Psychology*, *72*(4), 441–462.

Bass, B. M. (1985). *Leadership and performance beyond expectations*, New York: Free Press.

Bass, B. M. (1998). The ethics of transformational leadership. In: J. B. Ciulla (Ed.), *Ethics, the Heart of Leadership* (pp. 169-192). Westport (CN): Praeger.

Bjekić, R., Rodić, M., Aleksić, M., & Gašić, D. (2021). Relationship between social competences of manager and leadership outcomes. *Ekonomika*, *67*(2), p. 47-57. Doi: https://doi.org/10.5937/ekonomika2102047B

Burns, J. M. (1978). *Leadership*. Harper Torchbooks; 1st ed.

Bycio, P., Hackett, R. D., & Allen, J. S. (1995). Further assessments of Bass's (1985) conceptualization of transactional and transformational leadership. *Journal of Applied Psychology*, *80*(4), 468–478.

Drucker, P. (2003). *The New Realities*. Transaction Publishers; Revised edition (2003-08-25).

ElKordy, M. (2013). Transformational leadership and organizational culture as predictors of employees' attitudinal outcomes. *Business Management Dynamics*, *3*(5), 15-26.

Fiedler, F. E., & Garcia, J. E. (1987). New approaches to effective leadership: cognitive resources and organizational performance. New York: Wiley.

Fullagar, C., McCoy, D., & Shull, C. (1992). The socialization of union loyalty. *Journal of Organizational Behavior*, *13*(1), 13–26.

Graen, G., Orris, J. B., & Alvares, K. M. (1971). Contingency model of leadership effectiveness: some experimental results. *Journal of Applied Psychology*, *55*(3), 196-201.

Hackman, M. Z., & Johnson, C. E. (2004). *Leadership: a communication perspective*. Long Grove: Waveland Press.

Handy, C. (1993). *Understanding Organizations*, London: Penguin.

Howell, J. M., & Avolio, B. J. (1993). Transformational leadership, transactional leadership, locus of control, and support for innovation: Key predictors of consolidated-business-unit performance. *Journal of Applied Psychology*, *78*(6), 891–902.

http://www.businessdictionary.com/definition/organizational-culture.html
Imran, M. H., Ilias, M., Aslam U., & Rahman. U.-U. (2016). Organizational learning through transformational leadership. *Learning Organization*, *23*(4), 232-248.

Jaber, N. Z. (2015). An analysis of the Palestinian culture using Hofstede's cultural framework and its' implication on teachers' classroom practices and student's cultural identity. *Procedia - Social and Behavioral Sciences*, 205, p. 292 – 295.

Kaslow, N., Falender, C. A., & Grus, C. L. (2012). Valuing and practicing competency-based supervision: a transformational leadership perspective. *Training and Education in Professional Psychology*, *6*(1), 47-54.

Liu, C.-H. S., & Lee, T. (2019). The multilevel effects of transformational leadership on entrepreneurial orientation and service innovation. *International Journal of hospitality Management*, *82*, 278-286.

Mladenović, M., & Krstić, B. (2021). Barriers and measurement of work/life balance of managers and other employees. *Economics of sustainable development*, *5*(1), 23-31. Doi: https://doi.org/10.5937/ESD2101023M

Needle, D. (2004). Business in Context: an Introduction to Business and its Environment. 4th ed. London: Thomson Learning.

Nguyen, T. T., Mia, L., Winata, L., & Chong, V. K. (2016). Effects of transformational-leadership style and management control system on managerial performance. *Journal of Business Research*, *70*(C), 202-213. Doi: https://doi.org/10.1016/j.jbusres.2016.08.018

Niehoff, B. P., Enz, C. A., & Grover, R. A. (1990). The impact of top-management actions on employee attitudes and perceptions. *Group & Organization Studies*, *15*(3), 337–352.

Norlina, M. A., Jangga, R., Ismail, M., Nuur-Illa, S., Kamal, M., & Ali, N. (2015). *Influence of Leadership styles in Creating Quality Work Culture*. International accounting and business conference, IABC 2015. Doi: https://doi.org/10.1016/S2212-5671(15)01143-0

Pitman, J. (1993). *Probability*. Springer-Verlag NY, eBook ISBN: 978-1-4612-4374-8.

Podsakoff, P. M., MacKenzie, S. B., Moorman, R. H., & Fetter, R. (1990). Transformational leader behaviors and their effects on followers' trust in leader, satisfaction, and organizational citizenship behaviors. *Leadership Quarterly*, *1*(2), 107-142.

Rodić, M., & Marić, S. (2021). Leadership style and employee readiness: basic factors of leadership efficiency. *Strategic Management*, *26*(1), 53-65. Doi: https://doi.org/10.5937/StraMan2101053R

Schein, E. H. (1984). Coming to a new awareness of organizational culture. *Sloan Management Review*, *25*(2), p. 3.

Simić, I. (2020). Are managers and leaders one and the same? *Ekonomika*, *66*(3), 1-13. Doi: https://doi.org/10.5937/ekonomika2003001S

Szczepanska-Woszczyina, K. (2015). Leadership and organizational culture as the normative influence of top management on employee's behaviour in the innovation process. *Procedia Economics and Finance*, Volume 34, Pages 396-402. Doi: https://doi.org/10.1016/S2212-5671(15)01646-9

Tasić, I., Merdović, M., Jankov, J., Terek, E., Jovanović, Z., & Nikolić, M. (2020). Leadership, LMX and teaching process quality in primary schools. *Anali Ekonomskog fakulteta u Subotici*, *56*(43), 31-48. Doi: https://doi.org/10.5937/AnEkSub2001031T

Trépanier, S.-G., Fernet, C., & Austin, S. (2012). Social and motivational antecedents of perceptions of transformational leadership: a self-determination theory perspective. *Canadian Journal of Behavioural Science*, *44*(4), p. 272-277.

Weihrich, H., Cannice, M. V., & Koontz, H. (2010). *Management*. 13th ed. New Delhi: McGraw Hill.

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The nexus between FDI and external balance in selected Emerging European Economies – a panel data approach

Панел анализа везе СДИ и трговинског биланса одабраних европских економија у развоју и успону

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Abstract: This research focuses on the nexus between foreign direct investments (FDI) and external balance in selected Emerging European Economies (EEEs). Emerging countries in convergence process tend to have problem of structural external imbalance that is covered with foreign capital inflows. FDI are long-term and sustainable source of financing the current account deficit. The aim of this paper is to test if FDI together with chosen macroeconomic indicators are relevant factors of trading balance in EEEs in order to give useful implications towards economic policy creators in emerging economies. The research hypothesis is tested with robust micro panel models for total sample and two subperiods: before and after the structural break caused with Global financial crisis (GFC). The results indicate that substantial FDI inflows are significantly related with negative sum of trading balance on the total sample level i.e. average external position deficit is financed with the FDI inflows. Also, dummy variable for the Western Balkans indicates that FDI are significant variable that finances external imbalance in this subsample. The government policy recommendations are directed towards incentive measures for attracting greater FDI inflows, especially greenfield investments motivated with greater efficiency and export stimulation in order to stabilize trading balance and foster economic growth.
Keywords: FDI, trade balance, Emerging European Economies (EEEs), panel models.
JEL classification: C23, F14, F21, E22

Сажетак: Истраживање фокусира везу страних директних инвестиција (СДИ) и екстерне равнотеже у одабраним европским економијама у развоју и успону (ЕЕРУ). Земље у развоју и успону у процесу конвергенције имају проблем структурне екстерне неравнотеже која се покрива приливима страног капитала. СДИ су дугорочан и одржив извор финансирања дефицита биланса текућих трансакција. Циљ рада је тестирање да ли су СДИ заједно са одабраним макроекономским индикаторима значајни фактори трговинског биланса у ЕЕРУ ради пружања корисних импликација креаторима економске политике у економијама у развоју и успону. Истраживачка хипотеза се тестира применом робусних микро панел модела на укупном узорку и у два подпериода: пре и после структурног лома изазваног глобалном финансијском кризом (ГФК). Резултати указују да су већи приливи СДИ значајно повезани са негативним салдом трговинског биланса на нивоу укупног узорка тј. да се просечна дефицитна екстерна позиција финансира приливима СДИ. Такође, вештачка варијабла за групу Западног Балкана упућује да су СДИ значајна варијабла која финансира ектерну неравнотежу у овом подузорку. Препоруке државној политици су усмерене ка подстицајним мерама за привлачење већег прилива СДИ, посебно гринфилд инвестиција мотивисаних већом ефикасношћу и стимулацијом извоза ради стабилизације трговинског биланса и убрзања економског раста.

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Introduction

The main economic policy goals to establish simultaneous external and internal balance are difficult to execute simultaneously, especially in emerging economies and less developed countries. Emerging economies have continuous problem of insufficient domestic capital accumulation, low level of investments in GDP and external imbalance in convergence process towards developed countries. Foreign capital inflows, especially FDI as the long-term and stable financing source, play the crucial role for financing the economic development, as well as the current account.

External shocks like GFC and now pandemic of corona virus further complicate the possibility to achieve goals of sustainable economic growth, low inflation and unemployment rate, limited public debt and balanced current account. In line with this, Beljić & Glavaški (2021) analyzed effectiveness of government measures in cases of GFC compared to pandemic of corona virus with conclusion that fiscal and monetary support measures were stronger and more prompt in the current pandemic crisis. Also, emerging markets performed considerably worse than developed markets during this pandemic compared to the GFC with unfavorable higher costs of equity for investments in emerging markets (Kostin, Runge & Adams, 2021). According to UNCTAD, WIR (2021), FDI inflows have dropped by 35% on the global level and more by 58% in transition economies in 2020, with destabilization of economic prospects and trading position.

External shocks disrupt capital flows and provoke capital escape of portfolio investors from risky markets. Developing economies that have strong dependency from foreign capital and have substantial share of international companies on the domestic market with problems of structural current account deficits are especially vulnerable to external shocks, abrupt capital escape and consequential restrictive adjustments of real economy (Beker Pucar & Srdić, 2018). Also, significant FDI outflows and profit repatriation bring further unfavorable implications on the current account deficit of the host country. This implicates a strong interdependency between macroeconomic conditions, economic prospects, trading position and FDI flows.

The progress of real convergence of Central, Eastern and South-Eastern Europe is heterogeneous with faster improvement in the new EU countries and challenging development process in the Western Balkans (Žuk etal., 2018). Also, a better external trading position is present in the new EU members, while the Western Balkan countries face the problem of continuous deficit position. Factors that contributed to a greater success in the EU are improvements in institutions quality, innovations, competitiveness, trading openness, human capital, high FDI inflows and investment rates, production growth and lower unemployment.

Visegrad States, especially Poland and Romania, received the most FDI inflows in the sample of EEEs, which were positively correlated with substantial economic growth

(Ercegovac & Beker Pucar, 2021). Greater greenfield FDI inflows could be related with a favorable trade balance in the sample of EEEs, especially in Visegrad group of countries, while Western Balkans have substantially lower greenfield FDI inflows and troubled trading balance (Ercegovac & Beker Pucar, 2021a).

In the Western Balkans, the most FDI inflows in the past period were directed into services and non-tradable products through privatization and acquisitions in order to expand to the local market. These kinds of investment impact the increase of consumption and imports without beneficial effects on the exports rise. Ercegovac & Živkov (2018) stress the role of greater FDI inflows in tradable sectors and improvement of competitiveness position in order to increase the exports and balance the trading position. The Western Balkan countries need to improve government institutions and investment environment further and attract higher FDI inflows in adequate sectors with innovative technology that will speed up the catching up process and stabilize the external position.

Cvetanović, Despotović & Milovanović (2018) also investigated FDI inflows in Western Balkan countries in the period 2000-2016 and they concluded that received capital inflow was insufficient and that it is necessary to continue improvements in public institutions and business conditions. Cvetanović, Nedić & Despotović (2019) find that, in the period 2006-2017, Western Balkan countries significantly improved business conditions measured with *World Bank Ease of Doing Business Indicators*, with the great progress in the North Macedonia that aspires the rest of the region to furtherly improve environment for starting a business and attract foreign investors.

This study focuses on the nexus between the FDI net inflows and external balance in selected Emerging European Economies (EEEs). This research problem has not been researched enough, especially with panel data methodology in the sample of EEEs and with longer time dimension (1997-2017). The aim of this paper is to test if FDI together with chosen macroeconomic indicators are relevant factors of trading balance in EEEs, in order to give useful implications towards economic policy creators in emerging economies, especially for less developed countries of Western Balkans. Research hypothesis is tested with robust micro panel models for the total sample and in two subperiods: before and after the structural break caused with the Global financial crisis (GFC). The structure of the paper is organized as follows. After the Introduction section, Section 1 presents the literature review. Methodological framework, i.e. empirical model and data, are analyzed within Section 2, while Section 3 discusses panel data results. Concluding remarks are summarized within the last section.

1. Literature review

The existing literature provides inconsistent findings about FDI transmission effects on the host country economy. A summary outlook at potential positive and negative FDI transmission effects is presented In Table 1. As positive effects on the host country, we could stress the growth of financial resources, opening new work places, competitiveness growth, increase of exports, modern technology transfer, human capital rise and higher

economic growth (see e.g. De Mello, 1999; Noorbakhsh, Paloni & Youssef, 2001; Durham, 2004; Crespo & Fontura, 2007; Denisia, 2010). Lipsey (2004) adds the following potential effects on the host country: higher wages compared to domestic companies, introduction of capital intensive and technology advanced production methods and economy of scale, rise in productivity, greater consumer satisfaction, crowding out the small and inefficient local firms, greater foreign trade with participation in intermediary production chains.

Table 1: FDI transmission effects on the host country

The effects of FDI inflows on the host country	
Positive effects	***Negative effects***
greater inflow of necessary capital;	greater dependency of sudden capital escape;
economic growth stimulation;	greater disparity in regional development;
employment growth and higher wages;	growth of unemployment because of greater efficiency and production automatization;
higher productivity of manufacturing industry;	negative impact on the living environment;
competitiveness growth;	crowding out of local companies;
contemporary technology and knowledge transfer;	low absorption capacity of domestic firms and absence of modern technology transfer;
greater exports and favorable external position;	greater imports and worse external position;
improvements in organizational culture and management system;	growth of wages inequalities;
better supply of commodities by lower prices	use of scarce resources

Source: Ercegovac (2021) based on the literature review in PhD dissertation.

FDI brings external effects that have positive influence on the host country productivity while growth of shadow economy limits the volume of capital investments (Bilan etal., 2019). Simultaneously, FDI contributes to creation of new jobs and training programs for employed labor with following increased productivity (Bobenič Hintošova etal., 2018). Colak & Alakbarov (2017) concluded that FDI effects variate due to FDI type and industry sector with recommendations to attract more greenfield investments with positive impact on the increase of productivity and employment. In line with this, Bayar (2017) finds that greenfield investments achieve more significant impact compared to brownfield FDI on the host country's economic growth.

FDI inflows in transition countries bring new capital, contemporary technology and know-how with development of their international competitiveness (Zugic, 2011). Basu & Guariglia (2007) found evidence of a positive correlation between FDI and GDP growth in the vast sample of 119 countries. Moreover, Ameer & Hu (2017) stress a positive and significant impact of FDI inflows and outflows on economic growth in developing economies in the long run. On the other hand, research of Vasa & Angeloska (2020) suggests that there is a very weak correlation between increased FDI inflows and GDP growth with also a very weak correlation between FDI and decreasing unemployment in Serbia in the period 2007-2018. Also, there is a strong correlation between FDI and

increased imports, probably because of increased need for energy, equipment and intermediary products. Foreign trade balance had a strong correlation with share of value-added products in export and a middle strong correlation with GDP growth. These results imply that increased FDI inflows had no strong impact on the improved economic position in Serbia and that other factors contributed to economic growth, decreased unemployment and foriegn trade balance. These findings also could be related with unfavorable structure of received FDI inflows in Serbia that are mainly focused on domestic market, service sector and cheap labor.

In the literature reviewed, authors also stress the negative spillover effects of foreign investments like unemployment rise owing to manufacturing automatization (Almfraji & Almsafir, 2014; Iamsiraroj & Ulubasoglu, 2015), a growth of competition and crowding out the local competitors from the market (Aitken & Harrison, 1999; Agosin & Mayer, 2000), an absence of long term technology and knowledge transfer (Aitken & Harrison, 1999; Oetzel & Doh, 2009), negative effects on the living environment and considerable use of the local scarce resources (Oetzel & Doh, 2009) and an increase of workers income inequalities (Hanousek, Kočenda & Maurel, 2011).

Blomstrom & Kokko (1997) argue that FDI inflows have a potential to improve the economic development through a growth in productivity and exports, nevertheless, net benefits differ across host countries due to industry characteristics, financial sector development and business environmnent. Aitken, Hanson & Harrison (1997) also find that FDI have positive impact on the host country with rise of exports on the foreign markets. Hanousek, Kočenda & Vozarova (2020) conclude that FDI inflows affect the local firms through the competition and productivity channels and export spillovers. Kurtishi-Kastrati (2013) stress that FDI's positive impact on the external balance of host economy is dependent from the foreign investor's motivation. FDI motivated with higher efficiency can stimulate economic growth through the rise of exports and import substitution with local supply. Import substitution is fundamental to achieve double positive impact on the trade balance, because if MNEs import the intermediary products and inputs from their subsidies, FDI have influence on the greater external imbalance.

Denisia (2010) points out that benefits of FDI inflows in less developed countries are alternative source of financing substituting the country indebtedness, greater inflow of foreign currency, access to international markets and exports rise. Bucevska (2017) showed that FDI have positive impact on the current account in the candidate countries and potential candidate countries for EU submission, but significant only in the two panel estimation models (Albania, Croatia, North Macedonia, Serbia and Turkey) in the time period (Q12005-Q42015). The author concludes that FDI contribute to the growth of available capital stock and rise in exports industries along with the low contribution in domestic manufacturing and service industry. Also, Boljanović (2013) finds that if FDI level change by 1%, export level increases by 1.83% in countries of Central and Eastern Europe. Akbas, Senturk & Sancar (2013) showed presence of unidirectional link from FDI to current account deficit in the sample of G7 countries (1990-2011) using panel data models with cross section dependency.

2. Methodology and data

Panel data models have broad implementation in the empirical studies because of the great advantage to simultaneously combine cross-section data with time series. Baltagi (2005) stresses that panel data models provide more possibilities to identify and measure the effects of research problem. Eberhardt (2011) gives useful comparison of difference and appropriate application of two groups of panel data models: micro and macro heterogeneous panel data models. The main difference lies in time dimension that is longer in macro panels and model specification assumptions that are more restrictive in micro panel models like homogeneity of regression parameters, independent errors and stationarity of variables. This empirical study implements micro panel models with robust standard errors.

2.1. Empirical model

This study intends to give an adequate contribution to the existing literature concerning the nexus between FDI and external position in selected EEEs. The main objective is to test with a panel data approach whether FDI net inflows are relevant financing factor of the external balance, and to accordingly stress the relevant recommendations to policymakers in order to attract foreign investors and boost the real convergence process. In this paper, the authors implement micro panel models with robust standard errors: Fixed Effects (FE) and Random Effects (RE) with White corrected standard errors, Beck & Kats (1995) Panel corrected standard errors (PCSE) and Driscoll & Kraay (1998) robust standard errors in FE estimation.

On the total sample (1997-2017), the authors use the Driscoll & Kraay method which is well calibrated in larger time dimension panels with potential autocorrelation and residuals heteroscedasticity (Hoechle, 2007). This study also implements robust FE/RE estimation with PCSE method on the two subsamples: pre crisis (1997-2007) and post crisis (2008-2017) in order to shorten the time dimension to be adequate for model application and to estimate differences in regression coefficients in regard to the structural break of GFC and for the group of Western Balkan countries. With robust micro panel data models authors test the following hypotheses:

H*$_1$*: *The FDI net inflows are a relevant source of financing the external position in selected Emerging European Economies.*

H*$_2$*: *The chosen macroeconomic indicators - GDP per capita, inflation rate, government budget, government debt, REER, total factor productivity, labor productivity and tertiary education affect the external position in selected Emerging European Economies.*

Micro panel estimation models conducted in this study are widely used in the literature: Fixed and Random individual effects models, robust FE with White corrected standard errors (CSE), Panel-Corrected Standard Error (PCSE) estimation model (Beck & Katz, 1995) and Driscoll & Kraay estimation model of robust standard errors for coefficients estimated with FE (Driscoll & Kraay, 1998).

Regression equation for fixed individual effects model (FE) is as follows:

$$y_{it} = \beta_{1i} + \sum_{k=2}^{K} \beta_k x_{kit} + u_{it}, \qquad (1)$$

where y_{it} is the dependent variable for individual i at time point t, β_k represents constant regression coefficients of independent variables x_{kit} and u_{it} is standard error. The model includes the individual effects μ - heterogeneity of free member across individual units. The authors implement FE model with the dummy variable for Western Balkans in order to estimate individual effects on a dependent variable across cross-section data. Heterogeneity of the analyzed sample of countries implicates the estimation of the specified model with fixed individual effects.

Hoechle (2007) showed that Driscoll & Kraay standard errors for coefficients estimated by pooled OLS/WLS or FE are well calibrated in panels with large time dimension when autocorrelation and residuals heteroscedasticity are present. If residuals are heteroscedastic, alternative covariance matrix estimators like White version with robust standard errors are widely applied. Beck & Katz (1995) introduce a method of Panel Corrected Standard Errors (PCSE) that relies on POLS coefficient estimates. The PCSE provides precise estimation because this method includes large T asymptotic based standard errors, which correct the contemporaneous correlation between the subjects, with good performance in small panels.

The dependent variable is the external balance on goods and services (trading balance) in GDP. Research variables are chosen in order to test the hypotheses if FDI, economic development, inflation, government budget, public debt, productivity indicators and tertiary education, affect trading balance in selected EEEs. Given that this research focuses on EEEs that went through the macroeconomic stabilization and transition process in the analyzed time period (1997-2017), the research includes estimation of the relationship with macroeconomic indicators like GDP per capita, inflation, government budget, government debt and real effective exchange rate (REER). The estimated regression equation can be presented as follows:

$$EB_{it} = \beta_{1i} + \beta_1 FDI_{it} + \beta_2 GDPpc_{it} + \beta_3 INF_{it} + \beta_4 GB_{it} + \beta_5 GD_{it} + \beta_6 REER_{it} + \beta_7 TFP_{it} + \beta_8 LP_{it} + \beta_9 SET_{it} + u_{it} \qquad (2)$$

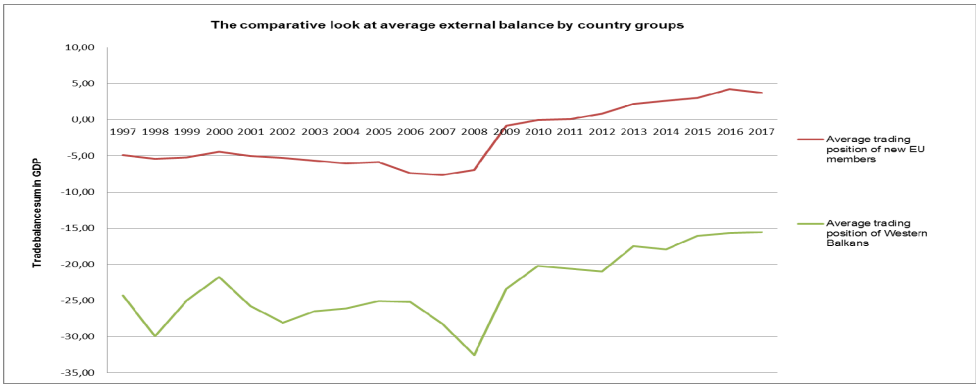
The independent variables in the analyzed model are: the share of FDI net inflows (inflows minus outflows) in GDP, annual GDP per capita, annual inflation rate, government budget balance in GDP, general government debt in GDP, REER (index drop represents real depreciation of national currency in regard to currency basket of 67 trading partners), total factor productivity growth rate (GDP growth decreased with total contribution of labor and capital services), labor productivity growth rate (output growth by employed worker) and tertiary education enrolment (share of college enrolment in total population of age 18-26).

2.2. Data

The research sample comprises EEEs that have gone through the transition process and become the EU members (Hungary, Poland, Czech Republic, Slovakia, Slovenia, Estonia, Lithuania, Latvia, Bulgaria, Romania and Croatia), as well as Western Balkan group of countries that are in the process of convergence towards the EU. The analyzed sample of selected sixteen EEEs (N=16) in the period 1997-2017 (T=21) covers different levels of development and convergence pace. The diversity of this sample entails the use of dummy variable in micro panel data specification for the group of less developed countries of Western Balkans (Serbia, Bosnia and Herzegovina, Montenegro, North Macedonia and Albania) in the mentioned two sub-periods (1997-2007; 2008-2017). The data for the dependent variable – trading balance in GDP was obtained from The World Bank – The World Development Indicators database. The data for the independent variables in the model were collected from the next internet databases:
(1) The World Bank, The World Development Indicators database - the share of FDI net inflows in GDP, annual GDP per capita, annual inflation rate and tertiary school enrolment;
(2) The International Monetary Fund database - general government debt in GDP;
(3) The Conference Board Total Economy Database - total factor productivity growth rate and labor productivity growth rate;
(4) The Country Economy Database - government budget balance in GDP;
(5) The Bruegel datasets - real effective exchange rate.

The presentation of the average trading balance in GDP for Western Balkans compared to the more developed countries of EU for the period 1997-2017 is shown in Figure 1. Analyzing the figure it is evident that EU group, before the entrance and until the GFC, had a low average deficit in the external position about 5%.

Figure 1: The comparative look at external balance of new EU members and Western Balkans (1997-2017)



Source: the authors' review based on data from the World Bank database https://data.worldbank.org/country/.

After the GFC, external position of the new EU member states improved further, with the average surplus position after the 2010. On the other side, less developed countries

of Western Balkans have more drastic external position deficit that is before the GFC about 20-30%, with slow gradual decrease after the crisis (about 15% in 2017).

In order to analyze the sample, Table 2 presents summary descriptive statistics for the selected variables in the period 1997-2017. All descriptive statistics, specification tests and model estimations were conducted with the Stata/SE 12.0 software program.

Table 2: Summary Statistics

Variable	Mean	Std. Dev.	Max	Min	Skewness	Kurtosis	Shapiro-Wilk W test	
							stat.	p-value
EB	-8.77	12.42	12.83	-71.06	-1.48	6.54	0.90	0.00
FDI	5.69	6.65	54.92	-15.99	3.61	23.59	0.67	0.00
GDP pc	8,764.82	5,998.29	27,501.81	717.38	0.77	2.69	0.92	0.00
INF	9.10	60.26	1.058.37	-1.54	16.69	290.11	0.09	0.00
GB	-2.91	3.01	8.43	-14.70	-0.36	4.93	0.97	0.00
GD	40.95	25.00	224.75	3.66	2.56	19.09	0.84	0.00
REER	94.23	13.98	145.69	47.50	-0.40	4.61	0.96	0.00
TFP	1.54	3.81	19.00	-16.93	-0.75	7.64	0.91	0.00
LP	3.17	4.32	24.00	-14.00	-0.08	5.98	0.96	0.00
SET	51.82	18.74	89.25	12.73	-0.16	2.16	0.98	0.00

Variables:
EB – percent share of external balance on goods and services in GDP;
FDI - percent share of FDI net inflows (inflows-outflows) in GDP;
GDP pc - annual GDP per capita;
INF - annual inflation rate (consumer prices);
GB – percent share of government budget balance (deficit/surplus) in GDP;
GD – percent share of general government debt in GDP;
REER - real effective exchange rate (an increase in the index indicates appreciation of the home currency against the basket of currencies of trading partners; CPI based on 67 trading partners; 2007 is the base year);
TFP - total factor productivity growth rate (GDP growth decreased for labor quantity contribution, labor quality contribution and total capital services contribution);
LP – labor productivity growth rate per employee (output per employed person, growth);
SET – gross percent of school enrolment tertiary - share of students on faculty level in total population of age group for tertiary education (18-26 years).

Source: the authors' calculations with Stata/SE 12.0 program.

Based on the descriptive statistics, it is evident that in the selected sample of EEEs is present a significant average external position deficit (almost 9%) with high standard deviation, which implies that countries in the sample have in average substantial external imbalance with high volatility in regard to mean (mostly because of Western Balkan countries). An average net FDI inflow in GDP of the sample is 5.69% with higher standard deviation 6.65%, that suggest a substantial variation in the sample data. Maximum value of FDI net inflows in GDP is recorded in Hungary in 2016 (55%), where is also present a minimum level of this indicator in the 2010 (-16%), which point out to high volatility of this indicator with great FDI outflows in this country.

Results for *skewness* imply that a strong negative asymmetry is present in variables external balance and total factor productivity growth, medium negative asymmetry is present in government budget and REER, while weak negative asymmetry is present in tertiary educated population. On the other hand a strong positive asymmetry is present in FDI, GDP per capita, inflation and government debt. No asymmetry i.e. normal distribution is present only for labor productivity growth. *Kurtosis* for all variables exceeds the reference value of the normal distribution, so we can conclude that data distribution is heavy-tailed. The results and probability level of the *Shapiro-Wilk W* test imply that the null hypothesis is rejected for all analyzed variables, thus they don't have a normal distribution. Based on the results of the mentioned statistical tests we can point out a presence of extreme values and deviation from normal distribution in the panel data.

3. Panel data results and discussion

According to the results of *Hausman* (1978) specification test (Table 3) *FE* estimation is optimal with consistent estimation in the both subperiods. The results of the *F* test (Table 3) indicate that the null hypothesis can be rejected in the both subperiods and that there are significant individual effects in the fixed effects model. On the basis of *modified Wald* statistics (Baum, 2001) results for the group heteroscedasticity (Appendix, Table A1) that have *p* values less than 0.05, it can be stressed that null hypothesis is rejected in the both subperiods with the presence of heteroscedasticity of standard errors in the model. The autocorrelation tests presented in Appendix, Table A2 - *Jochmans Portmanteau* test and *Born-Breitung Bias corrected HR* test (Jochmans & Verardi, 2019; Born & Breitung, 2016) suggest we can accept the null hypothesis with the absence of standard error autocorrelation in the pre and post crisis period. The results of the heteroscedasticity and autocorrelation tests suggest the application of the robust micro panel models like *FE* with *White* corrected standard errors.

The comparative outlook of robust panel model estimations is presented in the Table 3. Presented evidence supports the assumption of a negative nexus between FDI net inflows and external position in the EEEs before and after the crisis, in the total sample and in the Western Balkans in both subperiods.

Table 3: The panel data model of nexus between FDI and external balance

Nexus FDI - external balance in EEE

Model	Pre-crisis (1997-2007)				Post-crisis (2008-2017)				Total sample	
	Robust FE - White CSE		*PCSE*		*Robust FE - White CSE*		*PCSE*		*Driscoll & Kraay FE*	
Independent variables	coef.	p - value	coef.	p - value	coef.	p - value	coef.	p - value	coef.	p - value
FDI	-0.0521	0.608	-0.0398	0.574	-0.0427	0.269	-0.0687	0.355	**-0.1724*** **	0.006
WB FDI	-0.1241	0.342	-0.0069	0.979	**-0.1668** **	0.019	-0.2566	0.245	-	-
GDP pc	0.0000	0.998	**0.0008*** **	0.000	0.0004	0.263	**0.0010*** **	0.000	**0.0007*** **	0.000
INF	**0.0093***	0.053	0.0050	0.388	**-0.7014*** **	0.000	**-1.0055*** **	0.000	0.0004	0.923
GB	0.3347	0.229	**-0.4273** **	0.028	0.0705	0.433	0.3024	0.208	0.1801	0.539
GD	**0.0411** **	0.017	**0.0336*** **	0.007	**0.1504*** **	0.001	0.0443	0.198	**0.0439*** **	0.003
REER	**-0.1710** **	0.028	**-0.2773*** **	0.000	**-0.2289** **	0.018	-0.0411	0.600	**-0.1634*** **	0.005
TFP	0.2728	0.332	-0.0506	0.821	-0.0711	0.803	-0.2855	0.261	**0.4196** **	0.025
LP	-0.4591	0.209	-0.1051	0.645	0.0695	0.779	0.2730	0.189	**-0.7146*** **	0.003
SET	**0.0927** **	0.029	**0.2274*** **	0.001	**0.0841***	0.065	**0.1849*** **	0.000	0.0352	0.324
$R^{2\ within}$	0.344		0.311		0.680		0.610		0.348	
F test FE /	86.670	0.000	59.680	0.000	30.280	0.000	412.600	0.000	142.460	0.000
Wald chi test RE	p<0.05 FE present		p<0.05 RE present		p<0.05 FE present		p<0.05 RE present		-	-
Hausman test	39.680	0.000	p<0.05 Choice of FE		33.340	0.000	p<0.05 Choice of FE		-	-

Dependent variable: EB - external balance on goods and services in GDP;
Independent variables:
FDI - FDI net inflows in GDP;
WB FDI – dummy variable for FDI net inflows in GDP for Western Balkan group of countries;
GDP pc - annual GDP per capita;
INF - annual inflation rate;
GB - government budget balance in GDP;
GD - general government debt in GDP;
REER - real effective exchange rate;
TFP - total factor productivity growth;
LP - labor productivity growth per employee;
SET - school enrolment tertiary.
P-values: * significant at 10%, ** significant at 5%, *** significant at 1%.

Source: the authors' calculations with Stata/SE 12.0 program.

Akbas, Senturk & Sancar (2013) find the empirical support for unidirectional link from FDI to current account deficit in the sample of G7 countries using panel data models. The Driscoll & Kraay method of robust standard errors for FE estimation gives relevant results significant at probability value of 1% and support a negative nexus FDI – trade balance on the total sample level. Also, the results of Beck & Katz PCSE method confirm that a negative significant link between FDI and trade balance after the GFC, significant at 5% is present in the Western Balkan countries. The consistent problem of trade deficit in Western Balkans after the GFC is related with increased need for external financing with FDI. Western Balkans as members of CEFTA arrangement have consistent problem of external imbalance with trend of slow improvement after the GFC.

The model estimation for pre-crisis period indicates that external balance is in positive significant relation with the level of economic development i.e. GDP per capita, inflation, public debt and tertiary educated population. Before the GFC, the negative

significant connection is present between trading balance and government budget sum and real effective exchange rate. After the GFC, improvement in the external position (deficit decrease and surplus in more developed countries) is related with greater level of economic development, depreciation of REER i.e. better competitiveness of economy, growth of highly educated population, inflation decrease and public indebtedness. On the total sample of EEEs in the period 1997-2017, panel data estimation indicates that external position is positively connected with GDP per capita, public debt and growth of total factor productivity. Also, there is an evident negative significant link between trading balance and FDI net inflows, REER and labor productivity growth in the total sample of EEEs.

The variable of government debt has a positive significant link to trading balance in the both sub periods and total sample, which implies that public indebtedness is significant factor of financing the external position in the EEEs. Real effective exchange rate has a negative significant nexus with trading balance in the both sub samples and total sample, so it could be concluded that better external position is related to real depreciation and better national competitiveness in selected EEEs. Indicator of tertiary education is positively and significantly related to trading balance in pre-crisis and post-crisis period that implies a better external position is present in emerging economies with more highly educated work force.

On the basis of the robust panel model estimation, it can be highlighted that a positive significant link between GDP per capita and trade balance sum, significant at 1%, is present in the total research period and in the both subperiods. This evidence suggests that greater level of economic development is one of the key factors of better external position in EEEs. Other relevant factors of external balance are better national competitiveness and highly educated work force. Also, FDI net inflows are relevant variable that finances external position in the total research period and in subsample of Western Balkans after the crisis. This indicates that more developed and competitive countries in the sample have more balanced trade position, so greater FDI inflows and government policy measures should be directed in stimulation of sustainable economic development, greater competitiveness and export-oriented production that will furtherly boost GDP and trading balance. Also, according to Dorakh (2021) the main determinants of larger FDI inflows are infrastructure, connectivity and trade costs, therefore policy implications must include measures in directions of better connectivity with EU and China via Belt and Road Initiative (BRI). Moreover, based on Rajaković (2021), in order to achieve sustainable economic development, government incentive measures must be directed towards FDI and domestic investments in green technologies, clean energy and sustainable production for export.

Conclusion

Research findings of panel data model implicate a negative nexus between FDI net inflows and external position in EEE in the both sub periods, total sample and in Western Balkans before and after the crisis. The Driscoll & Kraay method of robust standard errors gives relevant results and supports the research hypothesis of negative nexus FDI – trade balance

on the total sample level. The convergence process of sustainable development in emerging economies is followed by external imbalances that should be financed with substantial long-term FDI inflows. Also, research results of Beck & Katz panel corrected standard errors method confirm that in the Western Balkan countries is present a negative significant link between FDI and trade balance in the post-crisis period. The consistent problem of trade deficit in Western Balkans after the GFC is related with increased need for external financing with FDI.

The results indicate that substantial FDI inflows are significantly related with negative sum of trading balance i.e. average external position deficit of the total sample is financed with FDI inflows. Also, dummy variable for the Western Balkans shows that FDI are a significant variable that finances external imbalance in this subsample in post crisis period. Moreover, results imply that more developed and competitive countries with highly educated labor have more balanced external position, so economic policy measures should be oriented towards stronger sustainable economic development. Presented research contributes to the existing literature with the evidence of significant nexus between FDI and key macroeconomic factors with external position as an adequate background for policy recommendations of economic authorities of EEEs and less developed Western Balkans. The recommendations are directed towards incentive measures for attracting greater FDI inflows, especially greenfield investments, motivated with greater efficiency and exports in order to stabilize the trading balance and further stimulate the economic growth. Improvements in convergence process, tertiary education, infrastructure, connectivity, government institutions, investment environment and country rating will attract foreign investors in the Western Balkan region. Western Balkans governments should implement the selective measures in order to promote beneficial greenfield efficiency-seeking investments in sustainable production for exports, as well as investors in clean energy and green innovative technology.

In line with this, direction for further research can be testing with panel data approach if greenfield FDI investments are positively related with trading balance and economic growth in the post crisis period. With the comparative estimations by micro panel models, authors could apply a dummy variable for the Western Balkans and EU members, differing thus emerging European country groups. Likewise, another research direction in investigation of connection between FDI, trade balance and economic growth comprise different methodological framework of macro panel techniques i.e. heterogeneous, non-stationary and dynamic panel models.

Appendix[1]

Table A1: Heteroscedasticity test with Wald statistics

Modified Wald test for the group heteroscedasticity in FE model	
Pre-crisis (1997-2007)	chi^2 (16) = 2048.700 Prob>chi^2 = 0.000
Post-crisis (2008-2017)	chi^2 (15) = 201.420 Prob>chi^2 = 0.000

Table A2: Autocorrelation tests

H_0: Absence of autocorrelation	***Jochmans Portmanteau test***		***Born & Breitung HR test***	
	Chi-sq	***Prob > Chi-sq***	***HR-statistics***	***p-value***
Pre-crisis (1997-2007)	16.000	1.000	1.130	0.258
Post-crisis (2008-2017)	15.000	1.000	1.830	0.067

References

Aitken, B., Hanson, G.H., & Harrison, A.E. (1997). Spillovers, foreign investment, and export behavior. *Journal of International Economics*, *43*(1), 103-132.

Aitken, B., & Harrison, A. (1999). Do domestic firms benefit from direct foreign investment? Evidence from Venezuela. *American Economic Review*, *89*(3), 605-618.

Agosin, M., & Mayer, R. (2000). Foreign investment in developing countries: Does it crowd in domestic investment? *UNCTAD Discussion Papers No. 146*, 1-20.

Akbas, Y.E., Senturk, M., & Sancar, C. (2013). Testing for causality between the foreign direct investment, current account deficit, GDP and total credit: evidence from G7. *Panoeconomicus, 6*, 791-812,
Doi: http://dx.doi.org/10.2298/PAN1306791A.

Almfraji, M.A., & Almsafir, M.K. (2014). Foreign direct investment and economic growth literature review from 1994 to 2012. Procedia – *International Conference of Innovation, Management and Technology Research ICIMTR 2013*, Malaysia, 206-213.

Ameer, W., & Xu, H. (2017). The long-run effect of inward and outward foreign direct investment on economic growth: evidence from developing economies. *Review of Innovation and Competitiveness. A Journal of Economic and Social Research*, *3*(2), 5-24.

Baltagi, B.H. (2005). *Econometric Analysis of Panel Data*. John Wiley & Sons.

Bilan, Y., Vasylieva, T., Lyeonov, S., & Tiutiunyk, I. (2019). Shadow economy and its impact on demand at the investment market of the country. *Entrepreneurial Business and Economics Review*, *7*(2), 27-43,
Doi: http://dx.doi.org/10.15678/EBER.2019.070202.

[1] Authors calculations in the Stata program for heteroscedasticity and autocorrelation.

Basu, P., & Guariglia, A. (2007). Foreign direct investment, inequality, and growth. *Journal of Macroeconomics*, *29*(4), 824–39.

Baum, C.F. (2001). Residual diagnostics for cross-section time series regression models. *The Stata Journal*, *1*(1), 101–104.

Bayar, Y. (2017). Greenfield and brownfield investments and economic growth: evidence from central and eastern european union countries. *Our Economy*, *63*(3), 19-26, Doi: https://doi.org/10.1515/ngoe-2017-0015.

Beck, N., & Katz, J.N. (1995). What to do (and not to do) with time-series cross-section data. *American Political Science Review*, Cambridge University Press, *89*(3), 634-647.

Beker Pucar, E., & Srdić, S. (2018). Vulnerability of emerging europe in external adjustment and financing mechanisms. *Revue d'études comparatives Est-Ouest*, *49*(3), 93-121.

Beljić, M., & Glavaški, O. (2021) Effectiveness of bail-out mechanism in the Eurozone: global vs. pandemic crisis. *The Annals of the Faculty of Economics in Subotica*, *57*(45), 79-95, Doi: https://doi.org/10.5937/AnEkSub2145079B.

Blomstrom, M., & Kokko, A. (1997). The impact of foreign investment on host countries: a review of the empirical evidence. *World Bank Policy Research Working Paper No. 1745*, 1-42.

Bobenič Hintošova, A., Bruothova, M., Kubikova, Z., & Ručinsky R. (2018). Determinants of foreign direct investment inflows: a case of the Visegrad countries. *Journal of International Studies*, *11*(2), 222-235, Doi: http://doi.org/10.14254/2071-8330.2018/11-2/15.

Boljanović, S. (2013). A comparative analysis of the impact of foreign direct investments on the structure and specialization of serbian and hungarian exports. *Economic Themes*, *51*(1), 37-57.

Born, B., & Breitung, J. (2016). Testing for serial correlation in fixed-effects panel data models. *Econometric Reviews,* 35, 1290–1316, Doi: https://doi.org/10.1080/07474938.2014.976524.

Bucevska, V. (2017). Current account deficits in the EU candidate and potential candidate countries: a panel analysis. *Economic Themes*, *55*(3), 305-318, Doi: https://doi.org/10.1515/ethemes-2017-0017.

Colak, O., & Alakbarov, N. (2017). do foreign direct investments contribute to employment? Empirical approach for the commonwealth of independent States. *Bilig*, 83, 147-169.

Crespo, N., & Fontoura, M.P. (2007). Determinant factors of FDI, spillovers – What do we really know? *World Development*, 35(3), 410-425.

Cvetanović, S., Despotović, D., & Milovanović, G. (2018). Foreign direct investments as a source of financing of economic development of Western Balkan countries. *Ekonomika*, *Journal of Economic Theory and Practice and Social Issues*, *64*(4), 17-28.

Cvetanović, S., Nedić, V., & Despotović, L. (2019). The Analysis of business conditions in western balkan countries. *Ekonomika*, *Journal of Economic Theory and Practice and Social Issues*, 65(3), 13-19.

De Mello Jr, L.R. (1999). Foreign direct investment-led growth: evidence from time series and panel data*. Oxford Economic Papers,* Oxford University Press, 51(1), 133-151.

Denisia, V. (2010). Foreign direct investment theories: an overview of the main FDI theories. *European Journal of Interdisciplinary Studies*, *2*(2), 104-110.

Dorakh, A. (2021). FDI determinants in Europe and chinese influence. *Serbian Journal of Management, 16*(1), 21 – 37, Doi: https://doi.org/10.5937/sjm16-22279.

Driscoll, J.C., & Kraay, A.C. (1998). Consistent covariance matrix estimation with spatially dependent panel data. *The Review of Economics and Statistics*, The MIT Press, *80*(4), 549-560.

Durham, J.B. (2004). Absorptive capacity and the effects of foreign direct investment and equity foreign portfolio investment on economic growth. *European Economic Review*, 48, 285-306.

Eberhardt, M. (2011). Panel time-series modeling: new tools for analyzing xt data. United Kingdom Stata Users Group Meetings, 1-42.

Ercegovac, D., & Živkov, D. (2018). Competitiveness of the Serbian economy, FDI and balance of trade deficit problem. *International Scientific Conference - Economic Development and Competitiveness of European Countries*, Novi Sad School of Business, 49-51.

Ercegovac, D. (2021). *The Analysis of Determinants and Effects of FDI on the Real Economy and External Balance of Emerging European Economies*. PhD dissertation, Faculty of Economics, Subotica.

Ercegovac, D., & Beker Pucar, E. (2021). FDI inflows in selected emerging european economies with reflections on economic growth. *Економика, Journal of Economic Theory and Practice and Social Issues*, *67*(4), 11-28, Doi: https://doi.org/10.5937/ekonomika2104011E.

Ercegovac, D., & Beker Pucar, E. (2021a). Greenfield FDI inflows in selected emerging european economies with reflections on external balance. Procedia - *26th International Scientific Symposium - Strategic Management and Decision Support Systems in Strategic Management SM2021*, Faculty of Economics in Subotica, 88-94.

Hanousek, J., Kočenda, E., & Maurel, M. (2011). Direct and indirect effects of FDI in emerging European markets: a survey and meta-analysis. *Economic Systems*, *35*(3), 301-322.

Hanousek, J., Kočenda, E., & Vozárová, P. (2020). Impact of multinational enterprises on competition, productivity and trade spillovers across european firms. *Finance a úvěr-Czech Journal of Economics and Finance*, *70*(2), 172-212.

Hausman, J.A. (1978). Specification test in econometrics. *Econometrica,* 46(6).

Hoechle, D. (2007). Robust Standard Errors for Panel Regressions with Cross-Sectional Dependence. *The Stata Journal.*

Iamsiraroj, S., & Ulubasoglu, M.A. (2015). Foreign direct investment and economic growth: a real relationship or wishful thinking? *Economic Modelling*, *51*, 200-213, Doi: https://doi.org/10.1016/j.econmod.2015.08.009.

Jochmans, K., & Verardi, V. (2019). xtserialpm: A portmanteau test for serial correlation in a linear panel model. *Cambridge Working Papers in Economics*, 1944, Faculty of Economics, University of Cambridge, Doi: https://doi.org/10.17863/CAM.40108.

Kostin, K.B, Runge, P., & Adamas, R. (2021). Investment strategies in pandemic situations: an analysis and comparison of prospective returns between developed and emerging markets. *Strategic Management*, *26*(1), 34-52, Doi: https://doi.org/10.5937/StraMan2101034K.

Kurtishi-Kastrati, S. (2013). The effects of foreign direct investments for host countrys economy. *European Journal of Interdisciplinary Studies*, *5*(1), 26-38.

Lipsey, R.E. (2004). Home and host country effects of foreign direct investment, challenges to globalization: analyzing the economics. *National Bureau of Economic Research, University of Chicago Press*, 333-382.

Noorbakhsh, F., Paloni, A., & Youssef, A. (2001). Human capital and FDI inflows to developing countries: new empirical evidence. *World Development*, *29*(9), 1593-1610.

Oetzel, J., & Doh, J.P. (2009). MNEs and development: A review and reconceptualization. *Journal of World Business*, *44*(2), 108-120.

Rajaković, I. (2021). Transition towards sustainable economy in Serbia – Lessons from Denmark. *Održivi razvoj*, 2/2021, 41-68, Doi: https://doi.org/10.5937/OdrRaz2102041R.

United Nations UNCTAD. (2021). *World Investment Report 2021, Investing in Sustainable Recovery, download from* https://unctad.org/system/files/official-document/wir2021_en.pdf.

Vasa, L., & Angeloska, A. (2020). Foreign direct investment in the Republic of Serbia: correlation between foreign direct investments and the selected economic variables. *Journal of International Studies*, 13(1), 170-183, Doi: https://doi.org/10.14254/2071-8330.2020/13-1/11.

Zugic, J. (2011). Foreign direct investment and global economic crisis in the Western Balkans: European perspectives. *Journal on European Perspectives of the Western Balkans*, 3(1), 69-90.

Żuk, P., Polgar, E.K., Savelin, L., Diaz del Hoyo, J.L., & Konig, P. (2018). Real convergence in central, eastern and south-eastern Europe. *ECB Economic Bulletin*, 3, 36-65.

Internet Databases:

1. Bruegel Datasets: http://bruegel.org/publications/datasets/real-effective-exchange-rates-for-178-countries-a-new-database/

2. Conference Board Total Economy Database: https://www.conference-board.org/data/economydatabase/

3. Country Economy Database: https://countryeconomy.com/deficit/

4. International Monetary Fund Database: https://www.imf.org/external/datamapper/DEBT1@DEBT/OEMDC/ADVEC/WEOWORLD/

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Љубојевић, Т.К. (1998).
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Референце иностраних аутора и иностраних институција (самом тексту и у литератури) се наводе латиничним писмом. Референце домаћих аутора се наводе ћириличним писмом, изузев наслова радова на енглеском језику или евентуално назива часописа (уколико је реч о часопису који се публикује на енглеском језику).

А. Часописи и остале периодичне публикације

Аутори се наводе по презимену, уз прво слово имена. Година објављивања се пише у заградама, иза којих се ставља тачка. Наслов чланка на енглеском језику пише се у *Sentence case*, односно велико слово се користи само на почетку наслова и код личних именица. Наслов часописа на енглеском језику пише се у *Title case*, односно све променљиве врсте речи се пишу великим почетним словом. Иза наслова часописа ставља се број годишта, који се пише курзивом:

Аутор, А., Аутор, Б. и Аутор, Ц. (година). Наслов чланка. *Наслов часописа, број годишта*(број свеске), странице.

➲ **Чланак једног аутора, из стручног часописа пагинираног по свескама**
Часописи који се пагинирају по свескама почињу страном 1 у свакој свесци, тако да се број свеске наводи у заградама након броја годишта. Заграде и број свеске се не пишу курзивом:

Танасијевић, В. (2007). A PHP project test-driven end to end. *Management Information Systems, 5* (1), 26-35.

Begg, D. (2007). A PHP project test-driven end to end. *Management Information Systems, 5* (1), 26-35.

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Перић, О. (2006). Bridging the gap: Complex adaptive knowledge management. *Strategic Management, 14*, 654-668.

Begg, D. (2006). Bridging the gap: Complex adaptive knowledge management. *Strategic Management, 14*, 654-668.

➲ **Чланак два аутора, из стручног часописа пагинираног по свескама**

Стракић, Ф., и Мирковић, Д. (2006). The role of the user in the software development life cycle. *Management Information Systems, 4* (2), 60-72.

Begg, D., и Burda, M. (2006). The role of the user in the software development life cycle. *Management Information Systems, 4* (2), 60-72.

➲ **Чланак два аутора, из стручног часописа пагинираног по годиштима**

Љубојевић, К., и Димитријевић, М. (2007). Choosing your CRM strategy. *Strategic Management, 15*, 333-349.

➲ **Чланак три до шест аутора, из стручног часописа пагинираног по свескама**

Јованов, Н., Бошков, Т., и Стракић, Ф. (2007). Data warehouse architecture. *Management Information Systems, 5* (2), 41-49.

➲ **Чланак три до шест аутора, из стручног часописа пагинираног по годиштима**

Бошков, Т., Љубојевић, К., и Танасијевић, В. (2005). A new approach to CRM. *Strategic Management, 13*, 300-310.

➲ **Чланак више од шест аутора, из стручног часописа пагинираног по свескама**

Љубојевић, К., Димитријевић, М., Мирковић, Д., Танасијевић, В., Перић, О., Јованов, Н., et al. (2005). Putting the user at the center of software testing activity. *Management Information Systems, 3* (1), 99-106.

➲ **Чланак више од шест аутора, из стручног часописа пагинираног по годиштима**

Стракић, Ф., Мирковић, Д., Бошков, Т., Љубојевић, К., Танасијевић, В., Димитријевић, М., et al. (2003). Metadata in data warehouse. *Strategic Management, 11*, 122-132.

➲ **Чланак из часописа**

Стракић, Ф. (2005, October 15). Remembering users with cookies. *IT Review*, *130*, 20-21.

➲ **Ауторизовани чланак из билтена**

Димитријевић, М. (2009, September). MySql server, writing library files. *Computing News, 57,* 10-12.

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VBScript with active server pages. (2009, Septembar). *Computing News, 57,* 21-22.

Б. Књиге, брошуре, поглавља из књига, енциклопедијске одреднице, критике и рецензије

Основни формат за књиге

Аутор, А. А. (Година издања). *Наслов дела: Велико почетно слово и у поднаслову*. Место: Издавач.

Напомена: Реч „место" увек означава град, али треба навести и земљу уколико град истог имена постоји у више држава.

➲ **Књига једног аутора**

Љубојевић, К. (2005). *Prototyping the interface design*. Суботица: Економски факултет.

➲ **Књига једног аутора, ново издање**

Димитријевић, М. (2007). *Customer relationship management* (6. izd.). Суботица: Економски факултет.

➲ **Књига два аутора**

Љубојевић, К., Димитријевић, М. (2007). *The enterprise knowledge portal and its architecture*. Суботица: Економски факултет.

➲ **Књига три до шест аутора**

Љубојевић, К., Димитријевић, М., Мирковић, Д., Танасијевић, В., и Перић, О. (2006). *Importance of software testing*. Суботица: Економски факултет.

➲ **Књига више од шест аутора**

Мирковић, Д., Танасијевић, В., Перић, О., Јованов, Н., Бошков, Т., Стракић, Ф., et al. (2007). *Supply chain management*. Суботица: Економски факултет.

➲ **Књига без аутора и уредника**

Web user interface (10. izd.). (2003). Суботица: Економски факултет.

➲ **Група аутора, предузеће, организација или државни орган као аутор**

Статистички завод Републике Србије. (1978). *Статистички годишњак Републике Србије.* Београд: Министарство за комуналне и социјалне службе.

➲ **Збирка**

Димитријевић, М., & Танасијевић, В. (ur.). (2004). *Data warehouse architecture*. Суботица: Економски факултет.

➲ **Поглавље у збирци**

Бошков, Т., и Стракић. Ф. (2008). Bridging the gap: Complex adaptive knowledge management. U T. Boškov i V. Tanasijević (ur.), *The enterprise knowledge portal and its architecture* (str. 55-89). Суботица: Економски факултет.

В. Необјављени радови

➲ **Реферат са научног скупа**

Љубојевић, К., Танасијевић, В., Димитријевић, М. (2003). *Designing a web form without tables*. Реферат саопштен на годишњем скупу Српског компјутерског савеза, Београд.

➲ **Необјављени рад или рукопис**

Бошков, Т., Стракић, Ф., Љубојевић, К., Димитријевић, М., и Перић, О. (2007. мај). *First steps in C++*. Необјављен рад, Економски факултет, Суботица.

➲ **Докторска дисертација**

Стракић, Ф. (2000). *Managing network services: Managing DNS servers*. Необјављена докторска дисертација, Економски факултет Суботица, Суботица.

➲ **Магистарски рад**

Димитријевић, М. (2003). *Structural modeling: Class and object diagrams.* Необјављен магистарски рад, Економски факултет, Суботица.

Г. Електронски медији

За чланке објављене на интернету важе иста упуства као за радове објављене у штампи. Наводе се сви подаци наведени у интернет извору, укључујући и број часописа у заградама.

Аутор, А., & Аутор, Б. (Датум објављивања). Наслов чланка. *Наслов интернет часописа, број годишта*(број часописа ако је назначен). Преузето са сајта http://www.anyaddress.com/full/url/

➲ **Чланак у интернет часопису**

Танасијевић, В. (март 2003.). Putting the user at the center of software testing activity. *Strategic Management*, *8* (4). Преузето 7. октобра 2004. са сајта www.ef.uns.ac.rs/sm2003

➲ **Документ организације**

Економски факултет Суботица. (5. март 2008.). *A new approach to CRM*. Преузето 25. јула 2008. са сајта http://www.ef.uns.ac.rs/papers/acrm.html

➲ **Чланак из интернет часописа са додељеним DOI**

За чланке у интернет часопису без DOI (идентификатора дигиталног објекта) навести URL.

Аутор, А., и Аутор, Б. Б. (Датум објављивања). Наслов чланка. *Назив часописа, број годишта*. Преузето са сајта http://www.anyaddress.com/full/url/

Јованов, Н., и Бошков, Т. (4. фебруар 2007.) A PHP project test-driven end to end. *Management Information Systems*, 2 (2), 45-54. Преузето са сајта http://www.ef.uns.ac.rs/mis/TestDriven.html.

2. Цитати из извора у тексту рада

➲ **Цитати**

Уколико се извор цитира дословце, наводи се име аутора, година издања и страница са које је цитат преузет (са назнаком "стр."). Цитат се уводи фразом која садржи ауторово презиме, а иза њега се ставља година објављивања у заградама.

> По Мирковићу (2001), „Примена складишта података може да буде ограниченог карактера, нарочито ако иста садрже поверљиве податке" (стр. 201).
>
> Мирковић (2001) сматра да „примена складишта података може да буде ограниченог карактера" (стр. 201). Какве неочекиване последице то има по обим доступности?

Уколико се у уводној фрази не именује аутор, на крај цитата се ставља ауторово презиме, година издања и број странице у заградама, нпр.

> Он сматра да „примена складишта података може да буде ограниченог карактера", али не објашњава могуће последице (Мирковић, 2001, стр. 201).

➲ **Резиме или парафраза**

> По Мирковићу (1991), ограничења у погледу употребе базе података могу бити ванског или софтверског карактера, или пак привремена или чак произвољна (стр. 201).
>
> Ограничења у погледу употребе базе података могу бити ванског или софтверског карактера, или пак привремена или чак произвољна (Мирковић, 1991, стр. 201).

➲ **Један аутор**

> Бошков (2005) упоређује обим приступа...
> Begg (2005) упоређује обим приступа...
>
> У једном раном истраживању обима приступа (Бошков, 2005), установљено је...

➲ У случају да има **два аутора**, увек се наводе оба имена:

> У једном другом истраживању (Мирковић и Бошков, 2006) закључује се да...

➲ У случају да има **три до пет аутора**, први пут се наводи свих пет аутора. Код наредних навода, наводи се име првог аутора, иза кога се ставља „и сар.".

> (Јованов, Бошков, Перић, Бошков, и Стракић, 2004).

Када се исти аутори наводе следећи пут, користи се име само првог аутора, иза кога се ставља „и сар.” у уводној фрази или заградама:

> По Јованову и сар. (2004), када се такав феномен јави поново, медији му обично посвећују далеко више пажње.
>
> Када се такав феномен јави поново, медији му обично посвећују далеко више пажње (Јованов и сар., 2004).

У енглеском тексту, иза „et” у „et al.” не ставља се тачка.

➲ **Шест или више аутора**

У уводној фрази се презиме првог аутора наводи у уводној фрази или у заградама:

> Yossarian и сар. (2004) тврде да...
>
> ...није релевантно (Yossarian i sar., 2001).

➲ **Неименован аутор**

Уколико дело није ауторизовано, извор се наводи по наслову у уводној фрази, или се прве 1-2 речи ставе у заграде. Наслови књига и извештаја се пишу курзивом, док се наслови чланака и поглавља стављају у наводнике:

> Слична анкета је спроведена у једном броју организације које имају стално запослене менаџере базе података (“Limiting database access”, 2005).

Уколико неко дело (нпр. реч уредника у новинама) нема аутора, наводи се првих неколико речи наслова, уз годину објављивања:

> (“The Objectives of Access Delegation,” 2007)

Напомена: У ретким случајевима кад је аутор потписан речју „Anonymous”, иста се сматра именом аутора (Anonymous, 2008). У том случају се у списку извора на крају рада као име аутора користи реч „Anonymoys”.

➲ **Организација или државни орган као аутор**

Уколико је аутор нека организација или државни орган, назив организације се ставља у уводну фразу или заграде први пут кад се извор наводи:

> По подацима Статистичког завода Републике Србије (1978), ...

Исто тако, код првог навођења се исписује пуни назив колективног аутора, уз скраћеницу у угластим заградама. Затим се код следећих навода користи скраћени назив:

> Преглед је ограничен на градове од 10.000 становника навише (Статистички завод Републике Србије [СОРС], 1978).
>
> Списак не садржи школе које су у претходном статистичком прегледу наведене као затворене (СОРС, 1978).

➲ Када се наводи **више од једног дела истог аутора**:

> (Безјак, 1999, 2002)

- Када је **више од једног дела истог аутора објављено исте године**, наводе се са словима а, б, ц, итд. иза године издања:

  (Griffith, 2002a, 2002b, 2004)

- **Два или више дела истог аутора објављена исте године**

Уколико су два или више извора коришћена у достављеном раду објављена од стране истог аутора исте године, ставке у списку референци се означавају малим словом (а, б, ц...) иза године. Мало слово се користи и код навођења извора унутар текста:

  Резултати анкете објављени код Theissena (2004a) показују да...

- Уколико нисте прочитали оригинално дело, наводи се аутор који Вас је упутио на исто:

  Бергсоново истраживање (поменуто код Мирковића и Бошкова, 2006)...

  Овде се у списку извора наводе Мирковић и Бошков (2006), а Бергсон не.

- Кад се наводи **више од једног аутора**, аутори се наводе абецедним редом:

  (Britten, 2001; Styrlasson, 2002; Wasserwandt, 1997)

- Кад нема **датума или године објављивања**:

  (Hessenberg, n.d.)

- **Код цитата се увек наводе странице:**

  (Мирковић и Бошков, 2006, стр. 12)
  (Begg i Burda, 2006, стр. 12)

  Мирковић и Бошков (2006, стр. 12) предлажу приступ по коме "почетно гледиште…

- **Навођење појединих делова дела:**

  (Theissen, 2004a, pogl. 3)

  (Keaton, 1997, str. 85-94)

- **Лична комуникација, и то интервјуи, писма, интерне поруке, е-маилови и телефонски разговори**, наводе се на следећи начин. (*Не* уносе се у списак извора.)

  (К. Љубојевић, лична комуникација, 5. мај 2008.).

3. Фусноте

Понекад се неко питање покренуто у тексту мора додатно обрадити у фуснотама, у којима се додаје нешто што је индиректној вези са темом, или дају додатне техничке информације. Фусноте се нумеришу експонентом, арапским бројевима на крају реченице, овако.[1] Фусноте на крају текста (*endnote*) се започињу на посебној страни, иза текста. Међутим, Уређивачки одбор часописа **не препоручује коришћење фуснота и завршних напомена**.

Technical instructions for paper formatting

Citations and Bibliography

The paper should consist of:

Title of the paper (no more than 10 words) in English.

Subtitle (optional) in English.

Personal data of authors/coauthors: name, surname, title and Institution in English.

Abstract of 200 words or less, giving the factual essence of the article, should be written in English.

Key words (no more than 10) in English.

Text of the paper, in English, cannot exceed 12 pages.

Bibliography.

Guidelines for the paper format

Type your work in a common Word Processor (e.g. MS Word).

Page format: B5.

Margin: 2 cm every

Font: Times New Roman, size 11 (use it for title, subtitle, figures, tables, abstract, key words, and so on).

Titles, subtitles, names of the tables, illustrations, figures, etc should be written in Arabic numerals.

Figures, illustrations and schemes should be enclosed in the .jpg format (resolution 300*300 dpi) or in the vector form (.wmf or cdr) with enclosed fonts or fonts transformed in curves. Figures, illustrations and schemes should be black-and-white (grayscale). For the texts included in figures, illustrations and schemes font Arial, size 9 pt is preferred.

1. Referencing Guide

The references should specify the source (such as book, journal article or a web page) in sufficient detail to enable the readers to identify and consult it. The references are placed at the end of the work, with sources listed alphabetically (a) by authors' surnames or (b) by the titles of the sources (if the author is unknown). Multiple entries by the same author(s) must be sequenced chronologically, starting from the earliest, e.g.:

Ljubojević, T.K. (1998).
Ljubojević, T.K. (2000a).
Ljubojević, T.K. (2000b).
Ljubojević, T.K., & Dimitrijević, N.N. (1994).

Here is a list of the most common reference types:

A. Periodicals

Authors must be listed by their last names, followed by initials. Publication year must be written in parentheses, followed by a full stop. Title of the article must be in sentences case: only the first word and proper nouns in the title are capitalized. The periodical title must be in title case, followed by the volume number, which is also italicized:

Author, A. A., Author, B. B., & Author, C. C. (Year). Title of article. *Title of Periodical, volume number*(issue number), pages.

➲ Journal article, one author, paginated by issue

Journals paginated by issue begin with page 1 in every issue, so that the issue number is indicated in parentheses after the volume. The parentheses and issue numbers are not italicized, e.g.

Tanasijević, V. (2007). A PHP project test-driven end to end. *Management Information Systems, 5* (1), 26-35.

➲ Journal article, one author, paginated by volume

Journals paginated by volume begin with page 1 in issue 1, and continue page numbering in issue 2 where issue 1 ended, e.g.

Perić, O. (2006). Bridging the gap: Complex adaptive knowledge management. *Strategic Management, 14*, 654-668.

➲ Journal article, two authors, paginated by issue

Strakić, F., & Mirković, D. (2006). The role of the user in the software development life cycle. *Management Information Systems, 4* (2), 60-72.

➲ Journal article, two authors, paginated by volume

Ljubojević, K., & Dimitrijević, M. (2007). Choosing your CRM strategy. *Strategic Management, 15*, 333-349.

➲ **Journal article, three to six authors, paginated by issue**

Jovanov, N., Boškov, T., & Strakić, F. (2007). Data warehouse architecture. *Management Information Systems, 5* (2), 41-49.

➲ **Journal article, three to six authors, paginated by volume**

Boškov, T., Ljubojević, K., & Tanasijević, V. (2005). A new approach to CRM. *Strategic Management, 13*, 300-310.

➲ **Journal article, more than six authors, paginated by issue**

Ljubojević, K., Dimitrijević, M., Mirković, D., Tanasijević, V., Perić, O., Jovanov, N., et al. (2005). Putting the user at the center of software testing activity. *Management Information Systems, 3* (1), 99-106.

➲ **Journal article, more than six authors, paginated by volume**

Strakić, F., Mirković, D., Boškov, T., Ljubojević, K., Tanasijević, V., Dimitrijević, M., et al. (2003). Metadata in data warehouse. *Strategic Management, 11*, 122-132.

➲ **Magazine article**

Strakić, F. (2005, October 15). Remembering users with cookies. *IT Review*, *130*, 20-21.

➲ **Newsletter article with author**

Dimitrijević, M. (2009, September). MySql server, writing library files. *Computing News, 57,* 10-12.

➲ **Newsletter article without author**

VBScript with active server pages. (2009, September). *Computing News,57,* 21-22.

B. Books, Brochures, Book Chapters, Encyclopedia Entries, And Book Reviews

Basic format for books

Author, A. A. (Year of publication). *Title of work: Capital letter also for subtitle*. Location: Publisher.

Note: "Location" always refers to the town/city, but you should also include the state/country if the town/city could be mistaken for one in another country.

➲ **Book, one author**

Ljubojević, K. (2005). *Prototyping the interface design*. Subotica: Faculty of Economics.

➲ **Book, one author, new edition**

Dimitrijević, M. (2007). *Customer relationship management* (6th ed.). Subotica: Faculty of Economics.

➲ **Book, two authors**

Ljubojević, K., Dimitrijević, M. (2007). *The enterprise knowledge portal and its architecture*. Subotica: Faculty of Economics.

➲ **Book, three to six authors**

Ljubojević, K., Dimitrijević, M., Mirković, D., Tanasijević, V., & Perić, O. (2006). *Importance of software testing*. Subotica: Faculty of Economics.

➲ **Book, more than six authors**

Mirković, D., Tanasijević, V., Perić, O., Jovanov, N., Boškov, T., Strakić, F., et al. (2007). *Supply chain management*. Subotica: Faculty of Economics.

➲ **Book, no author or editor**

Web user interface (10th ed.). (2003). Subotica: Faculty of Economics.

➲ **Group, corporate, or government author**

Statistical office of the Republic of Serbia. (1978). *Statistical abstract of the Republic of Serbia.* Belgrade: Ministry of community and social services.

➲ **Edited book**

Dimitrijević, M., & Tanasijević, V. (Eds.). (2004). *Data warehouse architecture*. Subotica: Faculty of Economics.

➲ **Chapter in an edited book**

Boškov, T., & Strakić. F. (2008). Bridging the gap: Complex adaptive knowledge management. In T. Boškov & V. Tanasijević (Eds.), *The enterprise knowledge portal and its architecture* (pp. 55-89). Subotica: Faculty of Economics.

➲ **Encyclopedia entry**

Mirković, D. (2006). History and the world of mathematicians. In *The new mathematics encyclopedia* (Vol. 56, pp. 23-45). Subotica: Faculty of Economics.

C. Unpublished Works

➲ **Paper presented at a meeting or a conference**

Ljubojević, K., Tanasijević, V., Dimitrijević, M. (2003). *Designing a web form without tables*. Paper presented at the annual meeting of the Serbian computer alliance, Beograd.

➲ **Paper or manuscript**

Boškov, T., Strakić, F., Ljubojević, K., Dimitrijević, M., & Perić, O. (2007. May). *First steps in visual basic for applications*. Unpublished paper, Faculty of Economics Subotica, Subotica.

➲ **Doctoral dissertation**

Strakić, F. (2000). *Managing network services: Managing DNS servers*. Unpublished doctoral dissertation, Faculty of Economics Subotica, Subotica.

➲ **Master's thesis**

Dimitrijević, M. (2003). *Structural modeling: Class and object diagrams.* Unpublished master's thesis, Faculty of Economics Subotica, Subotica.

D. Electronic Media

The same guidelines apply for online articles as for printed articles. All the information that the online host makes available must be listed, including an issue number in parentheses:

Author, A. A., & Author, B. B. (Publication date). Title of article. *Title of Online Periodical, volume number*(issue number if available). Retrieved from http://www.anyaddress.com/full/url/

➲ **Article in an internet-only journal**

Tanasijević, V. (2003, March). Putting the user at the center of software testing activity. *Strategic Management*, *8* (4). Retrieved October 7, 2004, from www.ef.uns.ac.rs/sm2003

➲ **Document from an organization**

Faculty of Economics. (2008, March 5). *A new approach to CRM*. Retrieved July 25, 2008, from http://www.ef.uns.ac.rs/papers/acrm.html

➲ **Article from an online periodical with DOI assigned**

Jovanov, N., & Boškov, T. A PHP project test-driven end to end. *Management Information Systems*, 2 (2), 45-54. doi: 10.1108/06070565717821898.

➲ **Article from an online periodical without DOI assigned**

Online journal articles without a DOI require a URL.

Author, A. A., & Author, B. B. (Publication date). Title of article. *Title of Journal, volume number*. Retrieved from http://www.anyaddress.com/full/url/

Jovanov, N., & Boškov, T. A PHP project test-driven end to end. *Management Information Systems*, 2 (2), 45-54. Retrieved from http://www.ef.uns.ac.rs/mis/TestDriven.html.

2. Reference Quotations in the Text

➲ **Quotations**

If a work is directly quoted from, then the author, year of publication and the page reference (preceded by "p.") must be included. The quotation is introduced with an introductory phrase including the author's last name followed by publication date in parentheses.

> According to Mirković (2001), "The use of data warehouses may be limited, especially if they contain confidential data" (p. 201).
>
> Mirković (2001), found that "the use of data warehouses may be limited" (p. 201). What unexpected impact does this have on the range of availability?

If the author is not named in the introductory phrase, the author's last name, publication year, and the page number in parentheses must be placed at the end of the quotation, e.g.

> He stated, "The use of data warehouses may be limited," but he did not fully explain the possible impact (Mirković, 2001, p. 201).

➲ **Summary or paraphrase**

> According to Mirković (1991), limitations on the use of databases can be external and software-based, or temporary and even discretion-based. (p.201)
>
> Limitations on the use of databases can be external and software-based, or temporary and even discretion-based (Mirković, 1991, p. 201).

➲ **One author**

> Boškov (2005) compared the access range…
>
> In an early study of access range (Boškov, 2005), it was found...

➲ When there are **two authors**, both names are always cited:

> Another study (Mirković & Boškov, 2006) concluded that…

➲ If there are **three to five authors**, all authors must be cited the first time. For subsequent references, the first author's name will cited, followed by "et al.".

> (Jovanov, Boškov, Perić, Boškov, & Strakić, 2004).

In subsequent citations, only the first author's name is used, followed by "et al." in the introductory phrase or in parentheses:

> According to Jovanov et al. (2004), further occurences of the phenomenon tend to receive a much wider media coverage.
>
> Further occurences of the phenomenon tend to receive a much wider media coverage (Jovanov et al., 2004).

In "et al.", "et" is not followed by a full stop.

➲ Six or more authors

The first author's last name followed by "et al." is used in the introductory phrase or in parentheses:

> Yossarian et al. (2004) argued that…
>
> … not relevant (Yossarian et al., 2001).

➲ Unknown author

If the work does not have an author, the source is cited by its title in the introductory phrase, or the first 1-2 words are placed in the parentheses. Book and report titles must be italicized or underlined, while titles of articles and chapters are placed in quotation marks:

> A similar survey was conducted on a number of organizations employing database managers ("Limiting database access", 2005).

If work (such as a newspaper editorial) has no author, the first few words of the title are cited, followed by the year:

> ("The Objectives of Access Delegation," 2007)

Note: In the rare cases when the word "Anonymous" is used for the author, it is treated as the author's name (Anonymous, 2008). The name Anonymous must then be used as the author in the reference list.

➲ Organization as an Author

If the author is an organization or a government agency, the organization must be mentioned in the introductory phrase or in the parenthetical citation the first time the source is cited:

> According to the Statistical Office of the Republic of Serbia (1978), …

Also, the full name of corporate authors must be listed in the first reference, with an abbreviation in brackets. The abbreviated name will then be used for subsequent references:

> The overview is limited to towns with 10,000 inhabitants and up (Statistical Office of the Republic of Serbia [SORS], 1978).
>
> The list does not include schools that were listed as closed down in the previous statistical overview (SORS, 1978).

➲ When citing **more than one reference from the same author**:

> (Bezjak, 1999, 2002)

➲ When several **used works by the same author were published in the same year**, they must be cited adding a, b, c, and so on, to the publication date:

> (Griffith, 2002a, 2002b, 2004)

➲ **Two or more works in the same parentheses**

When two or more works are cited parenthetically, they must be cited in the same order as they appear in the reference list, separated by a semicolon.

> (Bezjak, 1999; Griffith, 2004)

➲ **Two or more works by the same author in the same year**

If two or more sources used in the submission were published by the same author in the same year, the entries in the reference list must be ordered using lower-case letters (a, b, c…) with the year. Lower-case letters will also be used with the year in the in-text citation as well:

> Survey results published in Theissen (2004a) show that…

➲ To **credit an author for discovering a work**, when you have not read the original:

> Bergson's research (as cited in Mirković & Boškov, 2006)…

Here, Mirković & Boškov (2006) will appear in the reference list, while Bergson will not.

➲ When **citing more than one author**, the authors must be listed alphabetically:

> (Britten, 2001; Sturlasson, 2002; Wasserwandt, 1997)

➲ When there is **no publication date**:

> (Hessenberg, n.d.)

➲ **Page numbers must always be given for quotations**:

> (Mirković & Boškov, 2006, p.12)
>
> Mirković & Boškov (2006, p. 12) propose the approach by which "the initial viewpoint…

➲ **Referring to a specific part of a work**:

> (Theissen, 2004a, chap. 3)
>
> (Keaton, 1997, pp. 85-94)

➲ **Personal communications, including interviews, letters, memos, e-mails, and telephone conversations**, are cited as below. (These are *not* included in the reference list.)

> (K. Ljubojević, personal communication, May 5, 2008).

3. Footnotes and Endnotes

A few footnotes may be necessary when elaborating on an issue raised in the text, adding something that is in indirect connection, or providing supplementary technical information. Footnotes and endnotes are numbered with superscript Arabic numerals at the end of the sentence, like this.[1] Endnotes begin on a separate page, after the end of the text. However, journal **does not recommend the use of footnotes or endnotes.**

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