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Kristina Peštović\*

# Poslovanje bankarskog sektora Bosne i Hercegovine u periodu od 2019. do 2020. godine

## Performance of Banking Sector in Bosnia and Herzegovina from 2019 to 2020

### Rezime

U radu je provedena analiza poslovanja banaka u Bosni i Hercegovini u periodu od 2019. do 2020. godine sa aspekta profitabilnosti. Profitabilnost kao mera performansi uspešnosti poslovanja banaka posmatrana je sa aspekata analize trenda ostvarenog neto rezultata, analize prosečnog povrata na uložena sredstva i povrata na kapital, analize trenda neto dobitka vodećih banaka i analize faktora profitabilnosti. Istraživanje se zasniva na podacima iz finansijskih izveštaja 24 banke registrovane kod Centralne banke Bosne i Hercegovine. Rezultati istraživanja ukazuju na to da bankarski sektor u 2020. godini ostvaruje značajno niži nivo profitabilnosti u odnosu na prethodnu godinu. Posmatrajući koji faktori imaju značajan uticaj na profitabilnost, ističu se tržišno učešće i poslovanje u uslovima krize u 2020. godini. Detaljni rezultati provedene analize ukazuju na stanje bankarskog sektora kad je u pitanju profitabilnost, ali pružaju i smernice za razvoj politike poslovanja koja treba da bude usmerena na suzbijanje negativnog trenda u profitabilnosti banaka.

**Ključne reči:** bankarski sektor, profitabilnost.

### Abstract

The paper analyzes the performance of banks in Bosnia and Herzegovina in the period from 2019 to 2020 in terms of profitability. Profitability as a measure of the performance of banks was observed from the aspects of trend analysis of net results, analysis of average return on investment and return on equity, analysis of the trend of net profit of leading banks and analysis of profitability factors. The research is based on data from the financial statements of 24 banks registered with the Central Bank of Bosnia and Herzegovina. The results of the research indicate that the banking sector in 2020 will achieve a significantly lower level of profitability compared to the previous year. Observing which factors have a significant impact on profitability, market share and business in the conditions of the crisis in 2020 stand out. Detailed results of the analysis indicate the state of the banking sector in terms of profitability, but also provide guidelines for the development of business policy that should be aimed at combating the negative trend in bank profitability.

**Keywords:** banking sector, profitability.

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## UVOD

Bankarski sektor u Bosni i Hercegovini karakteriše poslovanje ukupno 24 banke. Na prostoru Republike Srpske registrovano je osam banaka, dok je 16 banaka registrovano na prostoru Federacije Bosne i Hercegovine (Centralna banka Bosne i Hercegovine, 2021b). Prema podacima iz Godišnjeg izveštaja Centralne banke Bosne i Hercegovine (2021a), poslovanje bankarskog sektora Bosne i Hercegovine karakteriše pad kreditne aktivnosti, koja je i jednim delom prouzrokovana isknjižavanjem dela nekvalitetnih kredita iz bilansa početkom izveštajne godine. Pored pada kreditne aktivnosti, bankarski sektor u 2020. godini karakteriše i rast depozita banaka. Na rast ukupnog depozitnog potencijala banaka u Bosni i Hercegovini uticali su depoziti nefinansijskih privatnih preduzeća (opširnije videti: Godišnji izveštaj, Centralna banka Bosne i Hercegovine, 2021).

Analiza poslovanja bankarskog sektora od izuzetne je važnosti kako za poslovanje samih banaka, tako i za obezbeđivanje opšteg društvenog interesa. Poslovne aktivnosti banaka rezultiraju ostvarivanjem različitih performansi čiji pozitivan i/ili negativan trend utiče na potrebu za izmenom politike poslovanja banke. Jedna od najznačajnijih performansi poslovanja jeste svakako profitabilnost koja ukazuje na stepen oplodnje uložених sredstava ili kapitala. Pozitivna profitabilnost omogućuje investiranje u poslovne aktivnosti i time ostvarivanje buduće ekonomske koristi (opširnije videti: Jakšić, Mijić, 2013).

U radu će biti sprovedena analiza poslovanja banaka u Bosni i Hercegovini sa aspekta analize profitabilnosti u periodu od 2019. do 2020. godine. Analiza profitabilnosti treba da pruži odgovore na sledeća pitanja:

- Da li poslovanje u uslovima korone krize u 2020. godini negativno utiče na profitabilnost banaka?
- Koji faktori imaju značajan uticaj na profitabilnost banaka u Bosni i Hercegovini?

Analiza profitabilnosti ukazaće na trend u ostvarenju neto rezultata, stope povrata na imovinu, stope povrata na kapital, kao i na faktore koji imaju signifikantan uticaj na kretanje profitabilnosti. Za potrebu istraživanja korišćeni su podaci iz javno dostupnih finansijskih izveštaja banaka koje su registrovane na sajtu Centralne banke Bosne i Hercegovine.

## 1. METODOLOGIJA ISTRAŽIVANJA

Osnovni cilj rada jeste da se sprovede analiza poslovanja bankarskog sektora Bosne i Hercegovine u periodu od 2019. do 2020. godine, kako bi se sagledao trend uspešnosti poslovanja u periodu

i tokom krize izazvane pandemijom virusa korona. Uspešnost poslovanja bankarskog sektora Bosne i Hercegovine posmatrana je sa aspekta profitabilnosti. Profitabilnost predstavlja meru oplodnje uložених sredstava (opširnije videti: Rodić i sar., 2017). Analiza poslovanja bankarskog sektora zasniva se na sledećem:

- analiza trenda ostvarenog neto rezultata u periodu od 2019. do 2020. godine,
- analiza prosečnog povrata na uložena sredstva i povrata na kapital,
- analiza trenda neto dobitka pet vodećih banaka,
- analiza faktora profitabilnosti.

Analiza trenda ostvarenog neto rezultata zasniva se na deskriptivnoj analizi strukture banaka koje ostvaruju pozitivan i negativan neto rezultat poslovanja, kao i na analizi kretanja ukupnog neto rezultata bankarskog sektora Bosne i Hercegovine. Analiza prosečnog povrata na uložena sredstva podrazumeva deskriptivnu analizu pokazatelja ROA (povrat na uložena sredstva) i pokazatelja ROE (povrat na kapital) u periodu od 2019. do 2020. godine. Povrat na uložena sredstva predstavlja najčešće korišćen pokazatelj analize profitabilnosti, koji ukazuje na procenat ostvarenja neto rezultata u odnosu na uloženu imovinu (opširnije videti: Asiri, 2015). Povrat na kapital predstavlja stepen oplodnje u odnosu na sopstveni kapital. Kako bi se sagledalo kretanje neto rezultata u posmatranom periodu, sprovedena je i analiza trenda neto dobitka pet vodećih banaka upravo po apsolutnoj visini neto dobitka koje su ostvarile u posmatranom periodu. U cilju davanja na odgovor da li poslovanje u uslovima korona krize negativno utiče na profitabilnost banaka, sprovedena je analiza faktora profitabilnosti bankarskog sektora. Profitabilnost je posmatrana kao povrat na uložena sredstva, dok su kao nezavisne varijable definisane sledeće: tržišno učešće, veličina preduzeća, učešće kredita i potraživanja u ukupnoj imovini, zaduženost i poslovanje u uslovima korona krize. Za potrebe istraživanja formiran je sledeći regresioni model (prema: Field, 2009):

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta$$

gde je:

$Y_i$  – povrat na imovinu (zavisna varijabla),

$X_1$  – tržišno učešće (nezavisna varijabla),

$X_2$  – veličina banke (nezavisna varijabla),

$X_3$  – učešće kredita i potraživanja u imovini (nezavisna varijabla),

$X_4$  – zaduženost (nezavisna varijabla),

$X_5$  – poslovanje u uslovima korona krize (nezavisna varijabla).

U narednoj tabeli prezentovana je metodologija izračunavanja zavisne i nezavisnih varijabli.

**Tabela 1.** Metodologija kalkulacije zavisne i nezavisne varijable modela (prema: Rodić i sar., 2017; Burja, 2011)

Varijabla	Naziv	Metodologija kalkulacije
$Y_1$	Povrat na imovinu	Neto rezultat / imovina
$X_1$	Tržišno učešće	Prihod od kamata, naknada i provizija / ukupan prihod od kamata, naknada i provizija
$X_2$	Veličina banke	Log imovina
$X_3$	Učešće kredita i potraživanja u imovini	Kredit i potraživanja / imovina
$X_4$	Zaduženost	Obaveze / ukupna pasiva
$X_5$	Poslovanje u uslovima korona krize	0 – poslovanje u 2019. godini 1 – poslovanje u 2020. godini

## INTRODUCTION

The banking sector in Bosnia and Herzegovina is characterized by the operations of a total of 24 banks. There are 8 banks registered in the Republic of Srpska, while 16 banks are registered in the Federation of Bosnia and Herzegovina (Central Bank of Bosnia and Herzegovina, 2021b). According to the data from the Annual Report of the Central Bank of Bosnia and Herzegovina (2021a), the operations of the banking sector of Bosnia and Herzegovina are characterized by a decline in lending activity, which was partly caused by derecognition of non-performing loans from the balance sheet at the beginning of the reporting year. In addition to the decline in lending activity, the banking sector in 2020 is also characterized by an increase in bank deposits. The growth of the total deposit potential of banks in Bosnia and Herzegovina was influenced by deposits of non-financial private companies (for more details see: Annual Report, Central Bank of Bosnia and Herzegovina, 2021).

The analysis of the banking sector’s operations is extremely important both for the operations of the banks themselves and for ensuring the general social interest. The business activities of banks result in the realization of various performances whose positive and/or negative trend affects the need to change the bank’s business policy. One of the most important business performances is certainly profitability, which indicates the degree of return on invested funds or capital. Positive profitability enables investment in business activities and thus the realization of future economic benefits (for more details see: Jakšić, Mijić, 2013).

The paper will conduct an analysis of the performance of banks in Bosnia and Herzegovina from the aspect of profitability analysis from 2019 to 2020. Profitability analysis should provide answers to the following questions:

Does doing business in the conditions of the corona crisis in 2020 negatively affect the profitability of banks?

What factors have a significant impact on the profitability of banks in Bosnia and Herzegovina?

Profitability analysis will indicate the trend in achieving net results, rates of return on assets, rates of return on equity, as well as factors that have a significant impact on profitability. For the purpose of the research, data from publicly available financial statements of banks registered on the website of the Central Bank of Bosnia and Herzegovina were used.

## 1. RESEARCH METHODOLOGY

The main goal of this paper is to conduct an analysis of the banking sector of Bosnia and Herzegovina from 2019 to 2020, in order to

see the trend of business success in the period and during the crisis caused by the coronavirus pandemic. The performance of the banking sector of Bosnia and Herzegovina was observed from the aspect of profitability. Profitability is a measure of return on invested funds (for more details, see: Rodic et al., 2017). The analysis of the banking sector’s performance is based on the following:

- Analysis of the trend of the achieved net result in the period from 2019 to 2020
- Analysis of average return on invested funds and return on equity
- Analysis of the net profit trend in 5 leading banks
- Profitability factor analysis

The analysis of the trend of the achieved net result is based on the descriptive analysis of the structure of banks that achieve positive and negative net operating results, as well as on the analysis of the movement of the total net result of the banking sector of Bosnia and Herzegovina. The analysis of the average return on invested funds includes a descriptive analysis of the ROA (return on invested assets) and ROE (return on equity) indicators from 2019 to 2020. Return on investment is the most commonly used indicator of profitability analysis, which indicates the percentage of net results in relation to invested assets (for more details see: Asiri, 2015). Return on equity represents the degree of return on shareholders’ equity. In order to see the movement of net results in the observed period, an analysis of the trend of net profit of the five leading banks was conducted according to the absolute amount of net profit they achieved in the observed period. In order to answer the question of whether doing business in the conditions of the corona crisis negatively affects the profitability of banks, an analysis of the profitability factors of the banking sector was conducted. Profitability was viewed as a return on investment, while the following were defined as independent variables: market share, company size, share of loans and receivables in total assets, indebtedness and operations in the conditions of the corona crisis. For the purposes of the research, the following regression model was formed (according to: Field, 2009):

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta$$

Where:

- Y<sub>i</sub> – return on assets (dependent variable)
- X<sub>1</sub> – market share (independent variable)
- X<sub>2</sub> – bank size (independent variable)
- X<sub>3</sub> – share of loans and receivables in assets (independent variable)
- X<sub>4</sub> – indebtedness (independent variable)
- X<sub>5</sub> – business operations in the conditions of the corona crisis (independent variable)

The following table presents the methodology for calculating the dependent and independent variables.

**Table 1.** Methodology of calculation of dependent and independent variables of the model (according to: Rodic et al., 2017; Burja, 2011)

Variable	Name	Calculation methodology
Y1	Return on assets	Net result/Assets
X1	Market share	Interest income, fees and commissions/Total interest income, fees and commissions
X2	Bank size	Log assets
X3	Share of loans and receivables in assets	Loans and receivables/Assets
X4	Indebtedness	Liabilities / Total assets
X5	Business operations in the conditions of the corona crisis	0 - business in 2019 1 - business in 2020

Istraživanje je bazirano na celokupnoj populaciji od ukupno 24 banke koje čine bankarski sektor Bosne i Hercegovine. Za potrebu istraživanja korišćeni su javno dostupni podaci iz popisa banaka Bosne i Hercegovine sa sajta Centralne banke Bosne i Hercegovine (2021), kao i finansijski izveštaji banaka preuzeti sa zvaničnih internet stranica banaka. Za potrebu obrade podataka korišćen je program SPSS v 23 (prema: Field, 2009).

## 2. REZULTATI I DISKUSIJA

Rezultati analize trenda ostvarenog neto rezultata banaka prezentovani su u narednoj tabeli.

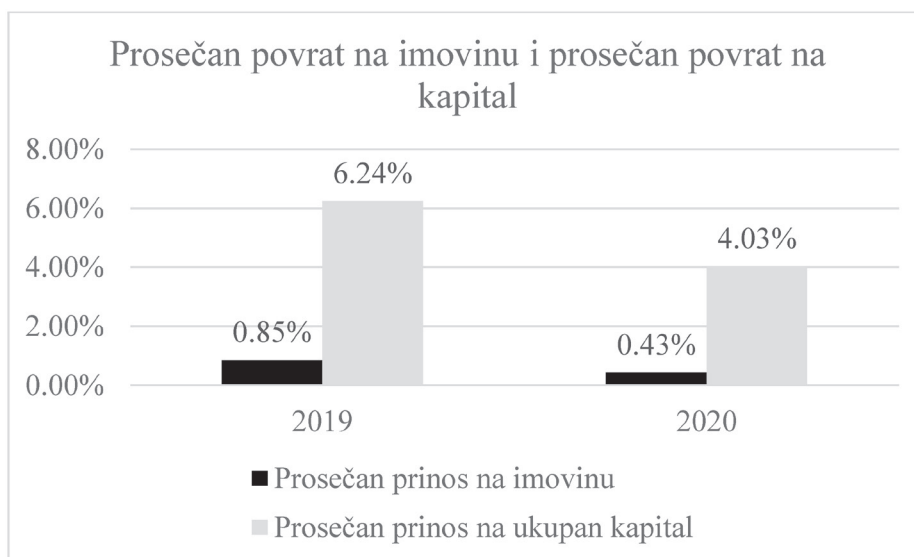
**Tabela 2.** Neto rezultat banaka u periodu od 2019. do 2020. godine

Godina	2019.	2020.	Trend 2020/2019.
Neto gubitak N	1	3	3
Neto dobitak N	23	21	0,91
Ukupno N	24	24	1
Neto gubitak	-1	-21	21
Neto dobitak	372	248	0,67
Ukupno	371	227	0,61

Analiza trenda ostvarenog neto rezultata ima negativnu tendenciju u periodu od 2019. do 2020. godine. U 2019. godini, od 24 banke, svega jedna banka ostvarila je neto gubitak. Ukupan neto rezultat bankarskog sektora u posmatranoj godini iznosio je 371 milion KM. U narednoj, 2020. godini tri banke su poslovale sa neto gubitkom, koji je ukupno iznosio 21 milion KM. Veći broj banaka sa neto gu-

bitkom, kao i manji ukupan iznos neto dobitka, uticali su na to da se ukupan rezultat poslovanja bankarskog sektora sa 371 milion KM smanji na 227 milion KM u 2020. godini. Na narednom grafiku prezentovani su rezultati analize prosečnog povrata na imovinu i prosečnog povrata na kapital.

**Grafik 1.** Prosečan prinos na imovinu i prosečan prinos na ukupan kapital



Prema rezultatima analize, prosečne stope povrata na uloženu imovinu i kapital takođe imaju negativnu tendenciju u periodu od 2019. do 2020. godine. Pad apsolutnih vrednosti neto rezultata banaka praćen je i padom prosečnih vrednosti koje se odnose na stepen oplodnje imovine i kapitala. U 2019. godini prosečna vrednost ROA iznosila je 0,85%, dok u 2020. godini prosečna vrednost

ROA iznosi 0,43%. Prema tome, u 2020. godini banke u proseku ostvaruju pozitivan neto rezultat u iznosu od 0,43% od uložene imovine. Pokazatelj profitabilnosti ROE u posmatranom periodu beleži pad sa 6,24% na 4,03%.

U narednoj tabeli prezentovani su rezultati top 5 banaka po visini neto rezultata.

**Tabela 3.** Analiza top 5 neto rezultata banaka u 2019–2020. godini (u hiljadama KM)

Banka	2019. godina	2020. godina	Trend 2020/2019.
1.	101.071	74.200	0,73
2.	56.901	44.621	0,78
3.	33.923	22.048	0,64
4.	32.775	18.245	0,56
5.	29.581	16.178	0,55
Ukupno banke 1–5	254.251	175.292	0,70
Ukupno banke 24	370.861	227.493	0,61

The research is based on the entire population of a total of 24 banks that make up the banking sector of Bosnia and Herzegovina. For the purpose of the research, publicly available data from the list of banks of Bosnia and Herzegovina from the website of the Central Bank of Bosnia and Herzegovina (2021) were used, as well as financial reports of banks downloaded from the official websites of banks. For the purpose of data processing, the program SPSS v 23 was used (according to: Field, 2009).

**Table 2.** Net result in banks from 2019 to 2020

Year	2019	2020	Trend 2020/2019
Net loss N	1	3	3
Net profit N	23	21	0,91
Total N	24	24	1
Net loss	-1	-21	21
Net profit	372	248	0,67
Total	371	227	0,61

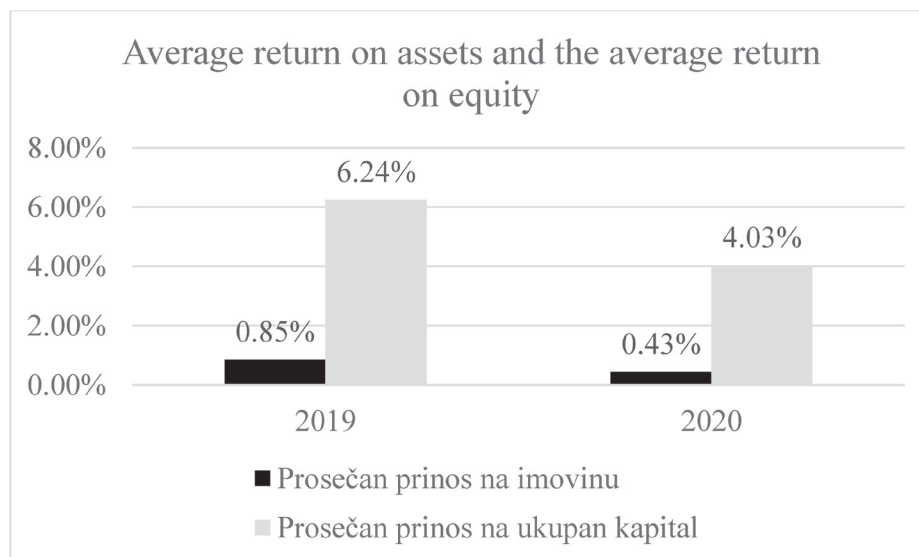
The trend analysis of the achieved net result has a negative tendency from 2019 to 2020. In 2019, out of 24 banks, only one bank made a net loss. The total net result of the banking sector in the observed year amounted to BAM 371 million. In the following 2020, three banks operated with a net loss of a total of 21 million BAM. A larger

## 2. RESULTS AND DISCUSSION

The results of the trend analysis of the achieved net results of banks are presented in the following table.

number of banks with a net loss, as well as a lower total amount of net profit, had the effect of reducing the total operating result of the banking sector from BAM 371 million to BAM 227 million in 2020. The following chart presents the results of the analysis of the average return on assets and the average return on equity.

**Chart 1.** Average return on assets and average return on equity



The results of the analysis of the average rate of return on invested assets and equity also have a negative trend from 2019 to 2020. The decline in the absolute values of banks' net results was accompanied by a decline in average values related to the rate of return on assets and equity. In 2019, the average value of ROA was 0.85%, while in 2020 the average value of ROA was 0.43%.

Therefore, in 2020, banks have an average positive net result of 0.43% of invested assets. The ROE profitability indicator in the observed period decreased from 6.24% to 4.03%.

The following table presents the results of the top 5 banks in terms of net results.

**Table 3.** Analysis of the top 5 net results of banks in 2019-2020 (in thousands of BAM)

Bank	2019.	2020.	Trend 2020/2019
1.	101.071	74.200	0,73
2.	56.901	44.621	0,78
3.	33.923	22.048	0,64
4.	32.775	18.245	0,56
5.	29.581	16.178	0,55
Total banks 1-5	254.251	175.292	0,70
Total banks 24	370.861	227.493	0,61

Top 5 banaka u Bosni i Hercegovini prema visini neto rezultata u 2019. godini ukupno su ostvarile 254.251 hiljadu KM, što je činilo 68,55% ukupnog neto rezultata bankarskog sektora. U 2020. godini primetan je pad apsolutne vrednosti ukupnog neto dobitka top 5 banaka u Bosni i Hercegovini. Međutim, dolazi i do većeg pada ukupnog neto rezultata bankarskog sektora, pa je posmatrano učešće top 5 banaka u ukupnom rezultatu 77,05%. Kod svake od vodećih banaka primetan je značajan pad neto dobitka koji su ostvarili u 2020. godini u odnosu na prethodnu godinu. U 2020.

godini vodeće banke beleže pad neto dobitka od 22% do 45% u odnosu na prethodnu poslovnu godinu.

U narednoj tabeli prezentovana je deskriptivna statistika zavisne varijable profitabilnosti (ROA) i nezavisnih varijabli tržišnog učešća, veličine banke, učešća kredita i potraživanja i zaduženosti u 2019. i 2020. godini. Najveće tržišno učešće vodeće banke u 2019. godini iznosi 17,03%, mereno na osnovu ostvarenih prihoda po osnovu kamata, naknada i provizija, dok je taj procenat u 2020. godini 16,83%.

**Tabela 4.** Deskriptivna statistika zavisnih i nezavisnih varijabli regresionog modela

Godina/varijabla		Broj banaka	Minimum	Maksimum	Srednja vrednost	St. devijacija
2019.	Y1	24	-0,0028	0,0217	0,0085	0,0064
	X1	24	0,0043	0,1703	0,0416	0,0434
	X2	24	5,0210	6,8176	5,9559	0,4129
	X3	24	0,0591	0,7201	0,5808	0,1452
	X4	24	0,4759	0,9321	0,8474	0,0908
2020.	Y1	24	-0,0129	0,0142	0,0042	0,0062
	X1	24	0,0041	0,1683	0,0416	0,0424
	X2	24	5,0391	6,7853	5,9681	0,4035
	X3	24	0,0622	0,7393	0,5602	0,1463
	X4	24	0,5294	0,9403	0,8614	0,0844

*Napomena: S obzirom na to da je varijabla  $X_5$  tzv. dummy varijabla, nije prezentovana deskriptivna statistika.*

Rezultati istraživanja faktora koji imaju značajan uticaj na profitabilnost banaka prezentovani su u narednoj tabeli. Analiza faktora koji imaju uticaj na profitabilnost banaka ukazuje da značajan uticaj imaju varijable  $X_1$  i  $X_5$ , odnosno tržišno učešće i poslovanje u uslovima korona krize. Dobijena p vrednost (značajnost) za varijablu  $X_1$  iznosi 0,071, što je manje od 0,10, dok dobijena p vrednost (značajnost) za varijablu  $X_5$  iznosi 0,017, što je manje od 0,05. U skladu sa dobijenim rezultatima, može se zaključiti da je varijabla  $X_1$  značajna uz nivo pouzdanosti od 90%, dok je varijabla

$X_5$  značajna uz nivo pouzdanosti od 95% (opširnije videti: Black, 2012). Naime, rezultati ukazuju na to da veće tržišno učešće utiče na ostvarivanje veće stope povrata na uložena sredstva. Sa druge strane, negativan uticaj poslovanja u uslovima korona krize ukazuje na to da se u 2020. godini ostvaruje znatno manji povrat na imovinu. Prema tome, može se zaključiti da je poslovanje u uslovima korona krize u 2020. godini značajno negativno uticalo na profitabilnost banaka u Bosni i Hercegovini.

**Tabela 5.** Regresiona analiza uticaja faktora na profitabilnost banaka

Model B	Nestand. koeficijenti		Stand. koeficijenti	t	Značajnost (p)
	Stand. greška	Beta			
1	Konstanta	-0,011	0,022	-0,504	0,617
	X1	0,053	0,038	0,342	<b>0,071</b>
	X2	0,001	0,004	0,047	0,184
	X3	0,009	0,006	0,202	1,549
	X4	0,009	0,011	0,117	0,837
	X5	-0,004	0,002	-0,316	-2,484
Zavisna varijabla: ROA					

## ZAKLJUČAK

Poslovanje bankarskog sektora u Bosni i Hercegovini, sa aspekta uspešnosti, merene kroz neto rezultat i poslovanje, ukazuje na značajne oscilacije u periodu od 2019. do 2020. godine. Poslovanje banaka u 2019. godini sa aspekta profitabilnosti može se oceniti kao značajno bolje nego u 2020. godini. Lošiji rezultati poslovanja

banaka u 2020. godini odraz su i otežanih uslova poslovanja koje karakteriše kriza izazvana virusom korona. U 2019. godini, od ukupno 24 banke, samo jedna banka poslovala je sa neto gubitkom. Ukupan neto rezultat na nivou svih banaka u 2019. godini iznosio je 371 milion KM. U 2020. godini, nepovoljni uslovi poslovanja doveli su do porasta broja banaka koje su ostvarile neto gubitak. Naime, od ukupno 24 banke, negativan neto rezultat ostvarile su tri



The top 5 banks in Bosnia and Herzegovina according to the amount of net results in 2019 achieved a total of 254,251 thousand BAM, which was 68.55% of the total net results of the banking sector. In 2020, there is a noticeable decline in the absolute value of the total net profit of the top 5 banks in Bosnia and Herzegovina. However, there is a greater decline in the overall net result of the banking sector, so the share of the top 5 banks in the total result of 77.05% was observed. Each of the leading banks has seen a significant decline in net profit in 2020 compared to the previous year. In 2020,

the leading banks recorded a decline in net profit from 22% to 45% compared to the previous business year.

The following table presents descriptive statistics of the dependent variable of profitability (ROA) and independent variables of market share, bank size, share of loans and receivables and indebtedness in 2019 and 2020. The largest market share of the leading bank in 2019 is 17.03% measured on the basis of revenues from interest, fees and commissions, while in 2020 this percentage is 16.83%.

**Table 4.** Descriptive statistics of dependent and independent variables of the regression model

Year / Variable		Number of banks	Minimum	Maximum	Median	St. deviation
2019	Y1	24	-0,0028	0,0217	0,0085	0,0064
	X1	24	0,0043	0,1703	0,0416	0,0434
	X2	24	5,0210	6,8176	5,9559	0,4129
	X3	24	0,0591	0,7201	0,5808	0,1452
	X4	24	0,4759	0,9321	0,8474	0,0908
2020	Y1	24	-0,0129	0,0142	0,0042	0,0062
	X1	24	0,0041	0,1683	0,0416	0,0424
	X2	24	5,0391	6,7853	5,9681	0,4035
	X3	24	0,0622	0,7393	0,5602	0,1463
	X4	24	0,5294	0,9403	0,8614	0,0844

Note: Since the variable X5 is the so-called dummy variable no descriptive statistics was presented.

The results of the research of factors that have a significant impact on the profitability of banks are presented in the following table. Analysis of factors that have an impact on the profitability of banks indicate that the variables X1 and X5 have a significant impact, ie market share and business operations in the conditions of the corona crisis. The obtained p value (significance) for variable X1 is 0.071, which is less than 0.10, while the obtained p value (significance) for variable X5 is 0.017, which is less than 0.05. In accordance with the obtained results, it can be concluded that variable X1 is significant with a confidence level of 90%, while

variable X5 is significant with a confidence level of 95% (for more details see: Black, 2012). Namely, the results indicate that higher market share affects the realization of a higher rate of return on assets. On the other hand, the negative impact of doing business in the conditions of the corona crisis, indicates that in 2020 there is a significantly lower return on assets. Therefore, it can be concluded that doing business in the conditions of the corona crisis in 2020 had a significant negative impact on the profitability of banks in Bosnia and Herzegovina.

**Table 5.** Regression analysis of the impact of factors on bank profitability

Model B		Non-standard coefficients		Standard coefficients	t	Significance (p)
		Stand. Greška	Beta			
1	Constant	-0,011	0,022		-0,504	0,617
	X1	0,053	0,038	0,342	1,392	<b>0,071</b>
	X2	0,001	0,004	0,047	0,184	0,855
	X3	0,009	0,006	0,202	1,549	0,129
	X4	0,009	0,011	0,117	0,837	0,408
	X5	-0,004	0,002	-0,316	-2,484	<b>0,017</b>

Dependant variable: ROA

## CONCLUSION

Business operations of the banking sector in Bosnia and Herzegovina, from the aspect of performance, measured through net results and business activities, indicate significant oscillations from 2019 to 2020. Banks' performance in 2019 can be assessed as significantly better in terms of profitability than in 2020. The poorer

results of banks' performance in 2020 are also a reflection of the difficult business conditions characterized by the corona virus crisis. In 2019, out of a total of 24 banks, only one bank recorded a net loss. The total net result at the level of all banks in 2019 amounted to BAM 371 million. In 2020, unfavorable business conditions led to an increase in the number of banks that made a net loss. Namely, out of a total of 24 banks, 3 banks achieved a negative net result.

banke. Takođe, primetan je i značajan pad ukupnog neto rezultata bankarskog sektora. U 2020. godini, ukupni neto rezultat koji je bankarski sektor generisao iznosio je 227 miliona KM.

Posmatrajući faktore koji utiču na povrat na imovinu kod banaka može se zaključiti da banke koje imaju veće tržišno učešće imaju i višu stopu povrata na imovinu. Ovaj zaključak donosi se uz nivo pouzdanosti od 90%. Uz nivo pouzdanosti od 95% može se zaključiti da poslovanje u uslovima korona krize dovodi do pada stope povrata na imovinu kod banaka. Ostali posmatrani faktori nemaju signifikantan uticaj na profitabilnost banaka merenu kroz povrat na imovinu. S obzirom na otežane uslove poslovanja koji su se nastavili i u 2021. godini, banke moraju da preuzmu aktivnu ulogu u pogledu analize politike u cilju obezbeđivanja zadovoljavajuće profitabilnosti.

## IZVORI

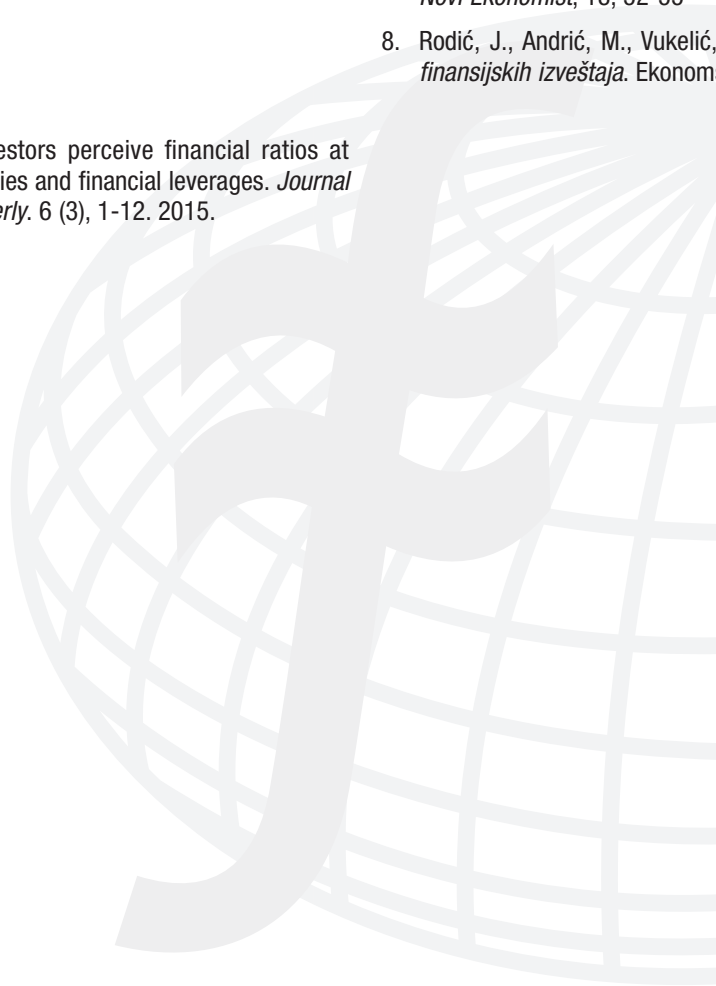
1. Asiri, B. (2015). How investors perceive financial ratios at different growth opportunities and financial leverages. *Journal of Business Studies Quarterly*, 6 (3), 1–12.
2. Black, K. (2012). *Business Statistics*. John Wiley & Sons, USA.
3. Burja, C. (2011). Factors influencing the companies' profitability. *Annals Universitatis Apulensis Series Oeconomica*, 13 (2), 215–224.
4. Centralna banka Bosne i Hercegovine (2021a). Godišnji izvještaj 2020. godina. Centralna banka Bosne i Hercegovine, Sarajevo.
5. Centralna banka Bosne i Hercegovine (2021b). Popis banaka u BiH, preuzeto sa sajta: <https://www.cbbh.ba/content/read/7>.
6. Field, A. (2009). *Discovering statistics using SPSS*. Sage Publication Ltd, London.
7. Jakšić, D., Mijić, K. (2013). Uticaj profitabilnosti na mogućnost dodatnog kreditnog zaduženja učesnika na finansijskom tržištu. *Novi Ekonomist*, 13, 52–55.
8. Rodić, J., Andrić, M., Vukelić, G., Vuković, B. (2017). *Analiza finansijskih izveštaja*. Ekonomski fakultet, Subotica.

Also, a significant decline in the overall net results of the banking sector is noticeable. In 2020, the total net result generated by the banking sector was BAM 227 million.

Looking at the factors that affect the return on assets in banks, it can be concluded that banks that have a higher market share have a higher rate of return on assets. This conclusion is derived with a confidence level of 90%. With 95% confidence, it can be concluded that doing business in the conditions of the corona crisis leads to a decline in the rate of return on assets in banks. Other observed factors do not have a significant impact on the profitability of banks measured through the return on assets. Given the difficult business conditions that have continued in 2021, banks must take an active role in terms of policy analysis in order to ensure satisfactory profitability.

## LITERATURE

1. Asiri, B. (2015). How investors perceive financial ratios at different growth opportunities and financial leverages. *Journal of Business Studies Quarterly*, 6 (3), 1-12. 2015.
2. Black, K. (2012). *Business Statistics*. John Wiley & Sons, USA
3. Burja, C. (2011). Factors influencing the companies' profitability. *Annals Universitatis Apulensis Series Oeconomica*, 13 (2), 215-224.
4. Centralna banka Bosne i Hercegovine. (2021a). Godišnji izvještaj 2020. godina. Centralna banka Bosne i Hercegovine, Sarajevo.
5. Centralna banka Bosne i Hercegovine. (2021b). Popis banaka u BiH, preuzeto sa sajta: <https://www.cbbh.ba/content/read/7>
6. Field, A. (2009). *Discovering statistics using SPSS*. Sage Publication Ltd, London.
7. Jakšić, D., Mijić, K. (2013). Uticaj profitabilnosti na mogućnost dodatnog kreditnog zaduženja učesnika na finansijskom tržištu. *Novi Ekonomist*, 13, 52-55
8. Rodić, J., Andrić, M., Vukelić, G., Vuković, B. (2017). *Analiza finansijskih izveštaja*. Ekonomski fakultet, Subotica.





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# Analiza tržišne koncentracije u bankarskom sektoru Republike Srpske

## Analysis of market concentration in the banking sector of the Republic of Srpska

### Rezime

Analiza i mjerenje nivoa koncentracije bankarskog tržišta značajna je komponenta efikasnog funkcionisanja privrede, pokazatelj razvoja finansijskog i realnog sektora, kao i pokazatelj stepena konkurentnosti u bankarskom sektoru. U ovom radu fokus je na istraživanju i analizi nivoa koncentrisanosti bankarskog tržišta Republike Srpske. Osnovni zadatak i cilj ovog istraživanja odnosi se na analizu nivoa koncentracije na bankarskom tržištu Republike Srpske. U svrhu istraživanja korišćeni su sljedeći pokazatelji: Herfindal-Hiršmanov indeks, racio koncentracije, vrijednost mjere entropije, varijansa prirodnih logaritama, Lorencova kriva i Džinijev koeficijent. Sve izračunate mjere ukazuju na postepeni trend povećanja koncentracije u bankarstvu u Republici Srpskoj u posmatranom periodu, s tim da je mala vjerovatnoća da bi u budućem periodu moglo da dođe do narušavanja konkurencije.

**Ključne riječi:** indeksi koncentracije, koncentracija kredita, koncentracija depozita, bankarstvo, bankarski sektor.

### Abstract

Analysis and measurement of the concentration level of the banking market is an important component of the efficient functioning of the economy, an indicator of the development of the financial and real sector, as well as a competitiveness degree indicator in the banking sector. This paper focuses on research and analysis of the concentration level of the banking market of the Republic of Srpska. The main task and goal of this research is to analyze the level of concentration in the banking market of the Republic of Srpska. For the purpose of the research, the following indicators were used: Herfindahl-Hirschman index, concentration ratio, value of entropy measure, variance of natural logarithms, Lorenz curve and Gini coefficient. All calculated measures indicate a gradual trend of increasing concentration in banking in the Republic of Srpska for the observed period, with a slight possibility that in the future there may be distortions in competition.

**Keywords:** concentration indices, credit concentration, deposit concentration, banking, banking sector

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## UVOD

Istraživanje načina funkcionisanja tržišta, kao i odnosa koji vladaju na pojedinim tržištima, predstavlja jednu od osnovnih oblasti koje istražuje mikroekonomija. Tržišta se često karakterišu prema nivou koncentracije prodavaca. Koncentracija tržišnih učesnika omogućava nam da sagledamo strukturu koja vlada na pojedinim tržištima. Struktura tržišta odnosi se na broj i distribuciju tržišnih učesnika (Besanko, 2016). Analiza broja tržišnih učesnika i njihove relativne snaga predstavlja polje mikroekonomije koje pruža mogućnost praktične primjene za pojedine tržišne učesnike. Razumijevanje tržišne strukture sa strane ponuđača daje nam odgovor na pitanje kakva je priroda posmatranog tržišta, odnosno posmatrane grane, te kakva konkurencija vlada na posmatranim tržištima. Informacije koje preduzeća u grani, ali i preduzeća koja pokušavaju da uđu u posmatranu granu dobijaju analiziranjem tržišne strukture ostalih učesnika na tržištu, kao i odnosa između samih učesnika, mogu da budu sredstvo njihove odluke o ulasku u posmatranu granu ili napuštanju grane. Koristi od analize koncentracije na pojedinim tržištima imaju i kreatori ekonomske politike, koji na taj način mogu da uređuju privredne grane u kojima postoji mogućnost nastanka monopola, te da djeluju antimonopolskom politikom.

Važnost analize koncentracije može da se posmatra sa aspekta njenog uticaja na cijenu koja se određuje u posmatranoj grani. Na bankarskom tržištu cijena pod kojom banka nudi svoje proizvode (kredite) jeste aktivna kamatna stopa, dok je cijena koju banka plaća klijentima na depozite pasivna kamatna stopa, koja predstavlja trošak za banku. U mnogim istraživanjima koncentracije u bankarskom sektoru analiziraju se upravo ove varijable i zavisnosti među njima. Međutim, Alihodžić (2019) istraživao je odnos između Bosne i Hercegovine (BiH) i Srbije, te uticaj na koncentrisanosti bankarskog sektora nezaposlenost u ove dvije zemlje u periodu od 2008. do 2018. primjenom dinamičkog modela. Kao nezavisne varijable u istraživanju navedene su: HHI indeks koncentracije, stopa rasta aktive, te stopa rasta likvidne aktive. Rezultati istraživanja pokazali su da rast koncentracije kredita i depozita ima negativan uticaj na kretanje stope nezaposlenosti, uz veliku značajnost koeficijenta modela, posebno za BiH (Alihodžić 2019).

Drugi autori istraživali su uticaj koncentracije u bankarskom sektoru na kretanje kamatnih stopa. Berger i Hannan (1989) istraživali su ovu vezu, te su pokazali da postoji negativan uticaj bankarske koncentracije na kamatne stope na depozite, pokazujući da stope na depozite padaju sa povećanjem koncentracije, odnosno pokazali su pozitivan uticaj na kretanje aktivnih kamatnih stopa (Cuestas et al., 2019).

## 1. PREGLED LITERATURE

### 1.1. Pokazatelji tržišne koncentracije

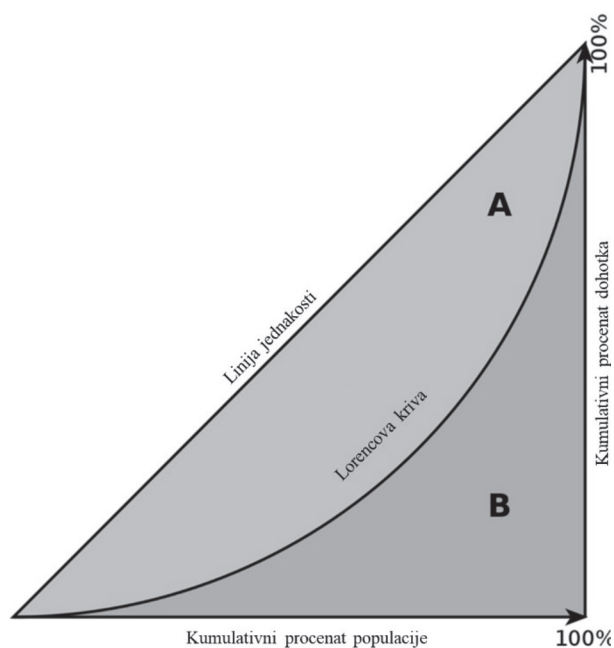
U ekonomskoj analizi, prvenstveno mikroekonomskoj analizi, postoji veliki broj alata kojima se mjeri tržišna koncentracija određene grane. Prilikom istraživanja koncentracije u bankarskom sektoru najviše se koriste Racio koncentracije (engl. Concentration Ratio – CR) i Herfindal-Hiršmanov indeks (engl. Herfindahl-Hirschman Index – HHI) koncentracije. Ove mjere koncentracije preporučuju se od strane Evropske centralne banke prilikom mjerenja koncentracije u bankarskom sektoru. Pored ovih pokazatelja korišćeni pokazatelji za datu analizu su i Tejlova mjera entropije (engl. Entropy Measure – E), Hol-Tajdmanov indeks (engl. Hall-Tideman index – HTI) koncentracije, kao i Rozenblutov indeks (engl. Rosenbluth index – RI) koncentracije, indeks obimnosti industrijske koncentracije (engl. Comprehensive

Industrial Concentration Index – CCI), Hausov multiplikativni indeks (engl. Haus multiplicative index – Hm), kao i Hausov aditivni indeks (engl. Haus additive index – Ha). Radi analiziranja tržišne koncentracije u bankarskom sektoru Republike Srpske korišćemo samo neke od njih. Analizu koncentracije vršićemo pomoću Lorencove krive i Džinijevog koeficijenta, racija koncentracije, Herfindal-Hiršmanovog indeksa, Tejllove mjere entropije i varijanse prirodnih logaritama tržišnih učešća pojedinačnih učesnika na tržištu.

#### 1.1.1. Lorencova kriva

Lorencova kriva jedna je od najčešće korišćenih mjera prilikom mjerenja koncentracije. Izvorno, ova kriva prvi put je primijenjena u istraživanju Maksa Lorenca 1905. godine prilikom analiziranja nejednakosti u raspodjeli bogatstva u SAD. Lorencova kriva je, u stvari, funkcija raspodjele  $L(X)$  ukupnog bogatstva populacije koji kumulativno zarađuju ispod određenog procenta populacije (Jantzen, Volpert, 2012). Lorencova kriva predstavlja se grafički u drugom kvadrantu koordinatnog sistema na intervalu  $[0,1]$  po  $x$  osi i istom intervalu po  $y$  osi. Na sljedećoj slici (slika 1) prikazan je primjer ove krive:

Slika 1. Lorencova kriva



Izvor: autorski prikaz

Na prethodnom grafičkom prikazu mogu se posmatrati dvije funkcije, tj. linije. Prva je linija jednakosti, odnosno potpune jednakosti svih, kumulativno posmatrano, učesnika populacije u raspodjeli prihoda. Može se vidjeti da je to funkcija  $y = x$ , odnosno to je linija od 45 stepeni. Osobine ove funkcije jesu da  $n\%$  populacije raspolaže sa tačno  $n\%$  dohotka,  $n = 0\%, \dots, 100\%$  ili  $n = 0, \dots, 1$ , gdje je  $n \in \mathbb{R}$ . Druga kriva na prethodnom prikazu jeste Lorencova kriva, koja predstavlja realniju sliku raspodjele bogatstva, prihoda, tržišnog učešća i slično, prema kumulativnom procentu ukupne populacije.

Formalnije, ako pretpostavimo postojanje niza  $x_1, x_2, \dots, x_n$  sa sljedećim svojstvima (Kovačić, Opačić, Marohnić, 2012):

- (1)  $x_i > 0$ , za svaki  $i \in [n]$ ;
- (2) postoji barem jedan  $i \in [n]$  takav da je  $x_i > 0$ ;

pretpostavljamo da je niz uzlazno uređen, budući da je svaki podskup skupa realnih brojeva moguće uzlazno odrediti, odnosno:

$$x_1 \leq x_2 \leq \dots \leq x_n.$$

## INTRODUCTION

Research on the functioning of markets, as well as the relationships that prevail in individual markets is one of the basic areas explored by microeconomics. Markets are often characterized by the concentration level of sellers. The concentration of market participants allows us to see the structure that prevails in individual markets. Market structure refers to the number and distribution of market participants (Besanko 2016). Analysis of the number of market participants and their relative strengths is a field of microeconomics that provides the possibility of practical application for individual market participants. The understanding of the market structure on part of the bidder gives us the answer to the question of the observed market's nature, ie the observed branch, and the kind of competition that reigns in the observed markets. The information that companies in the branch, but also companies trying to enter the observed branch, obtain by analyzing the market structure of other market participants, as well as the relations between the participants themselves, can be a means of their decision to enter the observed branch or leave it. The creators of economic policies also benefit from the analysis of concentration in certain markets, and they can in this way regulate economic branches in which there is a possibility of monopolies, and can also act with an antitrust policy.

The importance of concentration analysis can be observed from the aspect of its impact on the price determined in the observed branch. The importance of concentration analysis can be observed from the aspect of its impact on the price determined in the observed branch. On the banking market, the price at which a bank offers its products (loans) is the lending interest rate, while the amount the bank pays to customers on deposits is the deposit interest rate, which is paid at the bank's expense. Competition in banking sector is factor that determines stability of financial system (Ljumović et al., 2014). Market concentration represents main factor and indicator of competition between banks (Vuković, 2006). Rose (1999) suggests that degree of concentration in a market is measured by proportion of assets or deposits controlled by the largest banks serving that market. Demircug-Kunt and Levine measure concentration in banking sector via the fraction of bank loans controlled by three largest banks in system. Many studies of concentration in the banking sector analyze precisely these variables and the dependencies between them. However, from 2008 to 2018, using a dynamic model, Alihodžić (2019) investigated the relationship between the concentration of the banking sector and unemployment in Bosnia and Herzegovina (BiH) and Serbia, as well as the impact it has in these two countries in the period. The independent variables in the research are: HHI concentration index, asset growth rate, and liquid asset growth rate. The results of the research showed that a growing concentration of loans and deposits has a negative impact on the movement of the unemployment rate, while model coefficients are of great importance, especially for BiH (Alihodžić, 2019). Deidda and Fattouh (2002) examined the relationship between concentration and economic growth. Dumičić et al. (2012) conducted their research to investigate concentration in Croatian banking sector trough period from 2004 until 2011. based on several variables, such as deposits, loans, interest rates and non-interest revenue and profit after taxation. Begović (2012) investigated variables that affects market concentration of banking sector of Republic of Srpska.

Other authors have investigated the impact of concentration in the banking sector on interest rate movements (Naym, 2018., Hauge and Phan, 2010., Corvoisier and Gropp, 2001). Berger and Hannan (1989) looked into this relationship, and showed that banking concentration has a negative effect on deposit interest rates, revealing that interest rates on deposits fall with increasing concentration, or in other words they showed its positive impact on lending interest rates. Stojmenović (2021) suggests that lack of concentration on banking sector of Republic of Serbia and existing of trend (trough growth of market share of five largest banks) implicate possibility of reducing competition. Competitive pressure is heavier in the loan market than in deposit markets, so that banks compensate for their reduction in loan market income by lowering their deposit rates (Leuvesteij et al., 2008). Owen and Pereira (2018) investigated impact of degree of competition on financial inclusion. Tushaj (2016) suggests that increasing concentration in banking banking sector

of Albania weaknes bank lending channel, causing monetary policy to be less effective.

Aim of this paper is to investigate market concentration in banking sector of Republic of Srpska during COVID-19 crisis. This research is conducted for period since Q1 of 2019 until Q1 2021. Main objective of this research is to determine changes in market concentration using different indices for concentration trough these period based on quarterly data. This research examines assets, deposit and loan concentration between banks in banking sector of Republic of Srpska trough observed period.

## 1. LITERATURE REVIEW

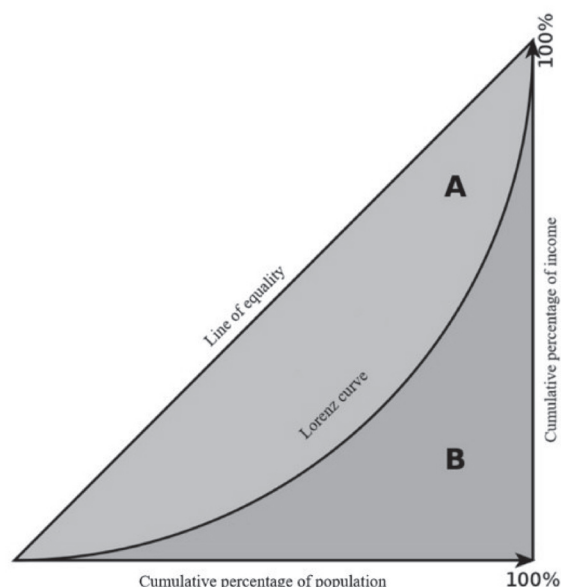
### 1.1. Market concentration indicators

In economic analysis, primarily microeconomic analysis, there are a large number of tools that measure the market concentration of a particular branch. Concentration Ratio (CR) and the Herfindahl-Hirschman Index (HHI) are the most widely used in the study of concentration in the banking sector. These concentration measures are recommended by the European Central Bank when measuring concentration in the banking sector. In addition to these, other available indicators used for this analysis are Entropy Measure (E), the Hall-Tideman index (HTI) of concentration, as well as the Rosenbluth index (RI) of concentration, the Comprehensive Industrial Concentration Index (CCI), the Haus multiplicative index (Hm) and the Haus additive index (Ha). In order to analyze the market concentration in the banking sector of the Republic of Srpska, we will use only some of them. We will perform the concentration analysis using the Lorenz curve, Gini coefficient, concentration ratio, the Herfindahl-Hirschman index, entropy measure and the variance of market shares' natural logarithms in individual market participants.

#### 1.1.1. Lorenz curve

The Lorenz curve is one of the most commonly used measures in measuring concentration. Originally, this curve was first applied in Max Lorenz's 1905 study when analyzing the inequalities in the distribution of wealth in the United States. The Lorenz curve is in fact a function of the distribution of  $L(X)$  the total wealth of a population that cumulatively earns below a certain percentage of the population (Jantzen & Volpert, 2012). The Lorenz curve is represented graphically in the second quadrant of the coordinate system on the interval  $[0,1]$  along the x axis and the same interval along the y axis. The following figure (Figure 1) shows an example of this curve:

Figure 1: Lorenz curve



Source: Author's review

Tada za svaki formiramo sljedeće tri relacije:

$$p_i := \frac{i}{n} \tag{1}$$

$$S_i := \sum_{k=1}^i x_k \tag{2}$$

$$y_i := \frac{S_i}{S_n} \tag{3}$$

Relacija (1) dijeli segment [0,1] na jednakih dijelova, relacija (2) definiše i-ti djelimični zbir članova niza, pri čemu je  $S_n$  zbir svih članova niza, dok relacija (3) definiše udio k-tog parcijalnog zbira u ukupnom zbiru svih članova niza (Kovačić, Opačić, Marohnić, 2012). Lorencovu krivu formiramo u skladu sa prethodno definisanim svojstvima, te predstavljamo relacijama. Formiranje ove krive započinjemo određivanjem tačaka  $T_i$ ,  $i \in [n]_0$ . Tačka  $T_0$  ima koordinate (0,0), odnosno ona predstavlja ishodište koordinatnog sistema i označava početnu tačku Lorencove krive. Interpretacija ove tačke je da 0% populacije raspolaže sa 0% prihoda. Zadnja tačka Lorencove krive označava se sa  $T_n$ . Ova tačka ima koordinate po x i y (1, 1), njena interpretacija govori da ukupna populacija raspolaže sa 100% prihoda, ili, u našem slučaju, učešća u bankarskim kreditima. Sve ostale tačke  $T_i$  izračunavamo prema prethodne tri relacije, te na ovaj način konstruišemo izlomljenu poligonalnu krivu L, kako je prikazano na prethodnoj slici. Ova kriva se naziva Lorencova i ona je funkcija raspodjele. Na ovaj način sve kumulativne proporcije na x osi su korespondirane sa njihovim odgovarajućim proporcijama na y osi (Damgaard, Weiner, 2000). Sve tačke krive L nalaze se na pravcu  $y=x$ , ili ispod tog pravca.<sup>1</sup>

Poenta kod tumačenja Lorencove krive jeste odstupanje krive raspodjele L od krive savršene jednakosti  $y=x$ . Ako je odstupanje ove

dvije krive veće, tada se površina A na prethodnoj slici povećava, pa se kriva L udaljava od linije od 45 stepeni. Shodno tome, površina A predstavlja mjeru odstupanja raspodjele od savršene jednakosti, ili mjeru disperzije, odnosno mjeru koncentracije. To dalje implicira povećanje površine A u ukupnoj površini pravouglog trougla koji je ograničen tačkama  $T_0$ ,  $T_n$  i  $x=1$ , čija je površina jednaka A+B. Stavljanjem u odnos površine A sa površinom pravouglog trougla dobijamo mjeru koncentracije. Što je ovaj omjer veći, to je veća površina odstupanja od savršene jednakosti, što dalje implicira veću tržišnu koncentraciju.

### 1.1.2. Džinijev koeficijent

Mjerenje površine A+B u ukupnoj površini pravouglog trougla vrši se izračunavanjem Džinijevog koeficijenta koncentracije. Džinijev koeficijent koncentracije predstavljen je od strane Korada Džinija 1912. godine. Neke ilustracije ovog koeficijenta mogu se pronaći kod Farisa (2010), dok detaljnu razradu prikazuju Ceriani i Verme (2012). Računanje Džinijevog koeficijenta bazirano je na Lorencovoj krivi. Površina trougla A+B ograničenog tačkama  $T_0$ ,  $T_n$  i tačkom  $x=1$  predstavlja polovinu od ukupne površine kvadrata (1, 0) (0, 1), koja iznosi 1, ili drugačije zapisano:

$$A + B = \frac{1}{2} = 0,5 \tag{4}$$

Iz (4) možemo izraziti Džinijev koeficijent koncentracije kao mjeru odstupanja raspodjele od linije savršene jednakosti na osnovu:

$$G = 1 - 2B \tag{5}$$

Formalno, obrazac za računanje ovog koeficijenta dat je u sljedećem obliku:

$$G = \frac{2 \sum_{i=1}^n r_i * x_i}{n \sum_{i=1}^n x_i} - \frac{n + 1}{n} \tag{6}$$

gdje je  $r_i$  rang tržišnog učesnika. Ovaj koeficijent kreće se u intervalu od 0 do 1. Ako je vrijednost koeficijenta bliža jedinici, tada je raspodjela udaljenija od linije savršene jednakosti, dok vrijednost koeficijenta koja je bliža 0 govori o većoj jednakosti u raspodjeli. Kada bi vrijednost koeficijenta iznosila 0, tada bi svaki tržišni učesnik ostvarivao jednak tržišni udio.

### 1.1.3. Racio koncentracije

Racio koncentracije jedna je od najčešće korišćenih mjera tržišne koncentracije, prije svega u bankarskom sektoru. Razlog intenzivnog korišćenja ove mjere tržišne koncentracije jeste lakoća tumačenja iste. Računanje racija koncentracije reda u opštem slučaju računa se prema obrascu:

$$CR_r = \frac{\sum_{i=1}^r X_i}{\sum_{i=1}^n X_i} \tag{7}$$

Racio koncentracije reda r pokazuje koliko r učesnika sa najvećim tržišnim učešćem učestvuje u ukupnom tržištu od učesnika. Najčešće se analiza koncentracije vrši pomoću racija koncentracije četvrtog reda ( $CR_4$ ), koji govori koliko četiri najveća tržišna učesnika učestvuju u ukupnoj tržišnoj ponudi. U našem slučaju, gdje imamo osam tržišnih učesnika, ovaj racio koncentracije će nam otkriti

koliko polovina najvećih banaka u Republici Srpskoj uzima ukupnog tržišnog učešća. Takođe, u radu ćemo računati i racio koncentracije drugog reda ( $CR_2$ ), koji će nam otkriti koliko dvije najveće banke u Republici Srpskoj uzimaju od ukupnog tržišta.

Racio koncentracije izražava se u postocima, od 0 do 100 posto. Ukoliko je vrijednost ovog racija bliža nuli, tada su tržišni udjeli

<sup>1</sup> Vidjeti dokaz: Kovačić, B., Opačić, R., Marohnić, L. (2012). O Ginijevu koeficijentu koncentracije. *Hrvatski matematički elektronički časopis*, 22 (1), 22–36.



Two functions, i.e. lines, can be observed in the previous graphic display. The first one is the line of equality, that is complete equality of all, cumulatively observed participants in the distribution of income. It can be seen that this is a function of  $y = x$ , i.e. it is a line of 45 degrees. What's characteristic about this function is that  $n\%$  of the population has exactly  $n\%$  of income,  $n = 0\%, \dots, 100\%$  or  $n = 0, \dots, 1$ , where  $n \in \mathbb{R}$ . The second curve in the previous presentation is the Lorenz curve, which represents a more realistic picture of the distribution of wealth, income, market share and the like, according to the cumulative percentage of the total population.

More formally, if we assume the existence of the sequence  $x_1, x_2, \dots, x_n$  with the following properties (Kovačić, Opačić, & Marohnić, 2012):

- (1)  $x_i > 0$ , then for every  $i \in [n]$ ;
- (2) There exists at least  $i \in [n]$  that is  $x_i > 0$ ;
- (3) We assume that the sequence is arranged in ascending order, since each subset of the set of real numbers can be determined in ascending order, on other words:

$$x_1 \leq x_2 \leq \dots \leq x_n$$

Then for each the following three relations are formed:

$$p_i := \frac{i}{n} \tag{1}$$

$$S_i := \sum_{k=1}^i x_k \tag{2}$$

$$y_i := \frac{S_i}{S_n} \tag{3}$$

Relation (1) divides segment  $[0,1]$  into  $n$  equal parts, relation (2) defines the  $i$ -th partial sum of sequence members, where  $S_n$  is the sum of all the members, while relation (3) defines the share of  $k$ -th partial sum in the total of all members of the series (Kovačić, Opačić, & Marohnić, 2012). We form the Lorenz curve in accordance with the previously defined properties and the presented relations. We begin the formation of this curve by determining the points  $T_i$ ,  $i \in [n]$ . Point  $T_0$  has coordinates  $(0,0)$ , i.e. it represents the point of origin for the coordinate system and it marks the starting point of the Lorenz curve, the interpretation of this point is that 0% of the population has 0% of income. The last point of the Lorenz curve is denoted by  $T_n$ , this point has coordinates by  $x$  and  $y$   $(1,1)$ , its interpretation says that the total population has 100% of income, or in our case participation in bank loans. We calculate all other points  $T_i$  according to the previous three relations, and in this way we construct a broken polygonal curve  $L$ , as shown in the previous figure, this curve is called the Lorenz curve and it is a distribution function. In this way, all cumulative proportions on the  $x$ -axis match their corresponding proportions on the  $y$ -axis (Damgaard & Weiner, 2000). All points of the curve  $L$  are in the direction  $y = x$ , or below that direction.

The point in interpreting the Lorenz curve is the deviation of the distribution curve  $L$  from the perfect equality curve. If the deviation of these two curves is greater, then the area  $A$  in the previous figure increases, so the curve  $L$  moves away from the line of 45 degrees. Accordingly, surface  $A$  represents a measure of deviation of the distribution from perfect equality, or a measure of dispersion, or a measure of concentration. This further implies that the increase in area  $A$  in the total area of a right triangle bounded by the points  $T_0$  and  $T_n$ , whose area is equal to  $\frac{1}{2}$ . By comparing area  $A$  with the surface of a right triangle, we obtain a measure of concentration. The higher this ratio, the larger the area of deviation from perfect equality, which further signifies greater market concentration.

### 1.1.2. Gini coefficient

Measurements of area in the total area of a right triangle are performed by calculating the Gini coefficient of concentration. The Gini coefficient of concentration was introduced by Korad Gini in 1912. Some illustrations of this coefficient can be found in Farris (2010). The calculation of the Gini coefficient is based on the Lorenz curve. The area of triangle bounded by points  $T_0$ ,  $T_n$  and point  $T_i$  represents half of the total area of the square  $(1,0)$   $(0,1)$  which equals 1; this can otherwise be written as:

$$A + B = \frac{1}{2} = 0,5 \tag{4}$$

From (4) we can express the Gini coefficient of concentration as a measure of deviation of the distribution from the line of perfect equality, on the basis of:

$$G = 1 - 2B \tag{5}$$

Formally, the form for calculating this coefficient is given as follows:

$$G = \frac{2 \sum_{i=1}^n r_i * x_i}{n \sum_{i=1}^n x_i} - \frac{n + 1}{n} \tag{6}$$

where  $r_i$  is the rank of the market participant. This coefficient ranges from 0 to 1. If the value of the coefficient is closer to one then the distribution is further from the line of perfect equality, while the value of the coefficient closer to 0 indicates greater equality in distribution. In the event that the value of the coefficient would be 0, each market participant would achieve an equal market share.

### 1.1.3. Concentration ratio

Concentration ratio is one of the most frequently used measures of market concentration, primarily in the banking sector. The reason for it being used so intensively is its ease of interpretation. The calculation of the concentration ratio by the order of  $r$  is generally done according to the formula:

više ujednačeni. S druge strane, ukoliko je vrijednost racija koncentracije bliža 100%, tada je tržište koncentrisano oko manjeg broja ponuđača, odnosno ako je vrijednost racija 100%, onda na tržištu postoji samo jedan prodavac, monopolista. Obično se uzima vrijednost koeficijenta od 50% kao granica za visoko koncentrisana tržišta. Ukoliko je vrijednost koeficijenta preko 50%, onda se tržište tretira kao visoko koncentrisano, dok vrijednost između 25% i 50% govori o umjerenoj koncentrisanosti tržišta.

$$HHI = \sum_{i=1}^n X_i^2 \quad (8)$$

Ovaj indeks, teorijski gledano, može da ima vrijednost od 0 do 10.000, odnosno između 0 i 1 ako u obzir uzimamo relativne vrijednosti učešća. U slučaju ujednačenog tržišnog učešća ponuđača, kada postoji ogroman broj proizvođača i kada ponuda svakog od njih teži 0, i vrijednost indeksa teži 0. Kod monopola, vrijednost indeksa iznosi 10.000, jer je ponuda monopolskog preduzeća jednaka ponudi cijele grane. Obično se ističe da vrijednost HHI indeksa od preko 2.600 znači veoma visoku koncentrisanost, dok vrijednost od 1.800 do 2.600 znači visoku koncentrisanost tržišta.

$$H = \sum_{i=1}^n p_i \log_2 \frac{1}{p_i} \quad (9)$$

gdje je  $n$  broj tržišnih učesnika u industriji, a  $p_i$  tržišni udjel  $i$ -tog tržišnog učesnika. Mjera entropije poprima vrijednosti od 0 do  $\log_2 n$ . Kada su tržišni udjeli svih tržišnih učesnika jednaki, tada je koncentracija najmanja i vrijednost mjere entropije u tom slučaju iznosi  $\log_2 n$ . U slučaju čistog monopola, vrijednost mjere entropije iznosi 0.

Pokazatelj entropije daje veću težinu manjim tržišnim učesnicima u industriji. Što je više tržišnih učesnika u industriji, pokazatelj entropije je manji, pa se može reći da je, po njemu, koncentracija direktno vezana s veoma malim brojem tržišnih učesnika i značajnom asimetrijom tržišnih udjela (Tipurić, Kolaković, Dumičić, 2002).

$$VL = \frac{\sum_{i=1}^n (\log x_i - \bar{X})^2}{n'} \quad (10)$$

gdje je:

$$\bar{X} = \frac{\sum_{i=1}^n \log x_i}{n'} \quad (11)$$

a  $x_i$  tržišno učešće  $i$ -tog privrednog subjekta izraženo u relativnim brojevima.

Ako su svi privredni subjekti identične veličine, VL će biti 0. Što je veća disperzija u veličini privrednih subjekata, veća je i koncentracija, a samim tim i vrijednost VL je veća. Ovaj pokazatelj, kao i Džini koeficijent, ima krupan nedostatak koji se ogleda u činjenici da se veći naglasak stavlja na nejednakost u veličini privrednih subjekata nego na njihov broj u jednoj grani (Lipczynski, Wilson, 2001, str. 112).

## 2. REZULTATI I DISKUSIJA ISTRAŽIVANJA TRŽIŠNE KONCENTRACIJE U BANKARSKOM SEKTORU REPUBLIKE SRPSKE

### 2.1. Bankarski sektor RS

Bankarski sektor Republike Srpske, na izvještajni datum 31. 12. 2020. godine, čini osam banaka i nije bilo promjene u odnosu na

### 1.1.4. Herfindal-Hiršmanov indeks

Ovaj indeks tržišne koncentracije najpoznatija je mjera za analizu koncentracije. Herfindal-Hiršmanov indeks, za razliku od racija koncentracije, uzima u obzir učešće svih preduzeća u okviru jedne grane, kao i odnose između njih. Računanje Herfindal-Hiršmanovog indeksa vršimo na osnovu sume kvadrata pojedinačnih učešća na tržištu svih tržišnih učesnika prema sljedećem obrascu:

### 1.1.5. Tejlva mjera entropije

Tejlva mjera entropije kao pokazatelj koncentrisanosti tržišnih učešća preuzeta je iz teorije sistema. Ovaj pokazatelj govori o raspršenosti, odnosno nestabilnosti tržišnih učešća pojedinačnih tržišnih učesnika. Izračunavanje koeficijenta entropije vrši se zbirom umnožaka tržišnog učešća svakog pojedinačnog učesnika i prirodnog logaritma recipročne vrijednosti tržišnih učešća. Formula za izračunavanje koeficijenta entropije data je izrazom:

### 1.1.6. Varijansa prirodnih logaritama tržišnih učešća

Brojne industrijske grane karakteriše to da distribucija veličina privrednih subjekata blisko korespondira log normalnoj distribuciji, koja podrazumijeva postojanje velikog broja malih privrednih subjekata, manjeg broja privrednih subjekata srednje veličine i najmanjeg broja velikih privrednih subjekata. Kao posljedica toga, veliki broj istraživača koristi varijansu prirodnih logaritama tržišnih učešća, kako bi ukazali na postojanje nejednakosti u veličini pojedinačnih privrednih subjekata. Varijansa prirodnih logaritama tržišnih učešća može se prikazati na sledeći način (Lipczynski, Wilson, 2001, str. 112):

kraj 2019. godine. Organizacionu mrežu čine 284 organizacione jedinice banaka sa sjedištem u Republici Srpskoj i 52 organizacione jedinice banaka sa sjedištem u Federaciji BiH.

Vlasničku strukturu karakteriše većinsko privatno vlasništvo u svim bankama, sa većinskim učešćem domaćeg akcionarskog kapitala u tri banke i većinskim stranim akcionarskim kapitalom u pet banaka u Republici Srpskoj.

Ukupni akcionarski kapital iznosi 674,0 miliona KM, a sastoji se od 99,2% privatnog akcionarskog kapitala, 0,8% državnog kapitala i vrlo malog učešća zadružnog kapitala.

Jedan od indikatora uspjehnosti poslovanja bankarskog sektora i svake banke pojedinačno je efikasnost zaposlenih iskazana kao odnos broja zaposlenih i ukupne aktive, pri čemu je veći iznos, po pravilu, pokazatelj bolje efikasnosti poslovanja banke i ukupnog sektora. Tri banke imaju aktivu po zaposlenom iznad 3 miliona KM, četiri banke između 2 i 3 miliona KM i jedna banka ispod 2 miliona KM.

Ukupna aktiva bankarskog sektora sa stanjem na dan 31. 12. 2020. godine iznosi 9,7 milijardi KM i bilježi rast od 276,4 miliona KM ili 3% u odnosu na kraj 2019. godine.

$$CR_r = \frac{\sum_{i=1}^r X_i}{\sum_{i=1}^n X_i} \tag{7}$$

The concentration ratio of the series by the order of  $r$  shows how many participants (value of  $r$ ) with the largest market share participate in the total market out of  $n$  participants. Concentration analysis is most often performed using a fourth-order concentration ratio ( $CR_4$ ), which tells how many of the four largest market participants participate in the total market supply. In our case, where we have eight market participants, this concentration ratio will reveal to us how much of the total market share do half of the largest banks in the Republic of Srpska take. Also, in this paper, we will calculate the concentration ratio of the second order ( $CR_2$ ), which will reveal how much the two largest banks in the Republic of Srpska take from the total market.

The concentration ratio is expressed as a percentage, from 0 to 100 percent. If the value of this ratio is closer to zero, the market shares are more uniform, on the other hand, if the value of the concentration

ratio is closer to 100%, then the market is concentrated around a smaller number of bidders, i.e. if the ratio is 100% then there is only one seller, or monopolist. The coefficient's value of 50% is usually taken as the limit for highly concentrated markets, if the value of the coefficient is over 50% then the market is treated as highly concentrated, while a value between 25% and 50% indicates moderate market concentration.

#### 1.1.4. Herfindahl-Hirschman Index

This market concentration index is the best known measure for concentration analysis. The Herfindal-Hirschman index, in contrast to the concentration ratio, takes into account the participation of all companies within one branch, as well as the relations between them. We calculate the Herfindal-Hirschman index based on the sum of squares of individual market shares of all market participants based on the following formula:

$$HHI = \sum_{i=1}^n X_i^2 \tag{8}$$

This index, theoretically speaking, can have a value between 0 and 10,000, or between 0 and 1 if we take into account the relative values of participation. In the case of a uniform market share of bidders, where there is a huge number of producers and when each of their bids approaches 0, the value of the index amounts to 0 as well. In monopolies, the value of the index is 10000, because the bid of a monopoly company is equal to the bid of the whole industry. It is usually pointed out that the value of the HHI index of over 2,600 means very high concentration, while a value of 1,800 to 2,600 means high market concentration.

#### 1.1.5. Entropy measure

Entropy measure as an indicator of the concentration of market shares is taken from the systems theory. This indicator speaks of dispersion, i.e. the instability of market shares of individual market participants. The calculation of the entropy coefficient is done by summing the products of the market share of each individual participant and the natural logarithm of the reciprocal value of the market shares. The formula for calculating the data entropy coefficient is the expression:

$$H = \sum_{i=1}^n p_i \log_2 \frac{1}{p_i} \tag{9}$$

where  $n$  is the number of market participants in the industry, and the market share of the  $i$ -th market participant. The measure of entropy takes values from 0 to  $\log_2 n$ . When the market shares of all participants are equal, then the concentration is the lowest and the value of the entropy measure in that case is  $\log_2 n$ . In case of a pure monopoly, the value of the entropy measure is 0.

The entropy indicator gives more weight to smaller market participants in the industry. The more market participants in the industry, the lower the entropy indicator, so it can be said that, according to him, concentration is directly related to a very small number of market participants and significant asymmetry of market shares (Tipurić, Kolaković and Dumičić, 2002).

#### 1.1.6. Variance of natural logarithms of market shares

Numerous industries are characterized by the fact that the size distribution of economic entities closely corresponds log to the normal distribution, which implies the existence of a large number of small economic entities, a small number of medium-sized economic entities and the smallest number of large economic entities. As a consequence, many researchers use the variance of natural logarithms of market shares, in order to point out the existence of inequalities in the size of individual economic entities. The variance of market shares' natural logarithms can be represented as follows (Lipczynski and Wilson, 2001, p. 112):

$$VL = \frac{\sum_{i=1}^n (\log x_i - \bar{X})^2}{n'} \tag{10}$$

where:

$$\bar{X} = \frac{\sum_{i=1}^n \log x_i}{n'} \tag{11}$$

and  $x_i$  market share of the  $i$ -th business entity expressed in relative numbers.

If all economic entities were of identical size, the VL would be 0. The greater the dispersion in the size of economic entities, the

higher the concentration, and thus the higher the value of VL. This indicator, like the Gini coefficient, has a major shortcoming, which is reflected in the fact that more emphasis is placed on inequality in the size of economic entities than on their number in a branch (Lipczynski and Wilson, 2001, p. 112).

Banke u Republici Srpskoj možemo podijeliti u tri grupe prema veličini bruto bilansne aktive:

- grupi banaka sa bruto aktivom preko 1.400 miliona KM pripadaju tri banke koje imaju učešće od 64,6% u ukupnoj aktivni, 61,8% u ukupnim kreditima, 65,7% u ukupnim depozitima i 68,1% u ukupno zaposlenim u bankarskom sektoru;
- grupi banaka sa bruto aktivom od 700 do 1.400 miliona KM pripadaju dvije banke koje imaju učešće od 21,3% u ukupnoj

aktivni, 23,7% u ukupnim kreditima, 20,6% u ukupnim depozitima i 11,4% u ukupno zaposlenim u bankarskom sektoru;

- sa bruto aktivom ispod 700 miliona KM su tri banke koje imaju učešće u ukupnoj bruto aktivni bankarskog sektora 14,1%, ukupnim kreditima 14,5%, ukupnim depozitima 13,6%, te zapošljavaju 20,5% od ukupnog broja zaposlenih u bankarskom sektoru.

Detaljniji podaci o poslovanju pojedinih banaka prikazani su u sljedećoj tabeli:

**Tabela 1.** Podaci o poslovanju banaka

BANKA	Na dan 31. 12. 2020. godine				
	Neto aktiva	Ukupni kapital	Ukupni krediti	Depoziti	Broj zaposlenih
Nova banka a.d. Banja Luka	2.317,3	184,0	1.536,0	1.771,3	715
UniCredit Bank a.d. Banja Luka	1.662,2	254,6	980,7	1.274,7	436
NLB Banka a.d. Banja Luka	1.564,1	192,1	879,7	1.237,5	479
Sberbank a.d. Banja Luka	955,5	124,3	679,1	742,1	392
Addiko Bank a.d. Banja Luka	820,9	148,9	622,4	602,5	339
MF banka a.d. Banja Luka	519,7	69,1	383,8	384,8	247
Komercijalna banka a.d. Banja Luka	461,1	62,7	313,1	335,4	163
Naša banka a.d. Bijeljina	207,8	18,6	98,9	166,8	198
	<b>8.508,6</b>	<b>1.054,3</b>	<b>5.493,8</b>	<b>6.515,2</b>	<b>2.969</b>

Izvor: Agencija za bankarstvo Republike Srpske, Izvještaj o stanju u bankarskom sistemu Republike Srpske, april 2021, str. 87.

Istorijske vrijednosti tržišne koncentracije za period od 2009. do 2018. godine na bankarskom tržištu Republike Srpske mjerene Hiršman-Herfindalovim indeksom prikazane su u sljedećoj tabeli:

**Tabela 2.** Vrijednosti Hiršman-Herfindalovog indeksa u periodu 2008–2018.

Godina	Hiršman-Herfindalov indeks		
	Aktiva	Depoziti	Krediti
2009.	1,807	1,858	2,072
2010.	1,696	1,750	1,960
2011.	1,608	1,614	1,680
2012.	1,560	1,558	1,550
2013.	1,498	1,530	1,479
2014.	1,601	1,655	1,601
2015.	1,664	1,681	1,650
2016.	1,778	1,817	1,741
2017.	1,820	1,853	1,803
2018.	1,730	1,748	1,698

Izvor: Agencija za bankarstvo Republike Srpske, Izvještaj o stanju u bankarskom sistemu Republike Srpske, april 2021, str. 29.

Za tri osnovna segmenta poslovanja (kreditni, depoziti i aktiva), vrijednost HHI indeksa ukazuje na postojanje umjerene koncentracije kod sva tri segmenta poslovanja koji su blizu gornje granice koja dijeli umjerenu i visoku koncentraciju.

Istorijske vrijednosti koncentracijske stope (CR<sub>3</sub>) za tri najveće banke tokom perioda od 2009. do 2018. godine u bankarskom sektoru Republike Srpske prikazane su u narednoj tabeli:

**Tabela 3.** Vrijednosti racija koncentracije CR<sub>3</sub> u periodu 2008–2018.

Godina	Racio koncentracije CR <sub>3</sub>		
	Aktiva	Depoziti	Krediti
2009.	66,4	66,9	67,8
2010.	63,9	64,5	65,8
2011.	62,1	62	61,7
2012.	60,1	59,7	58,5
2013.	58,2	58,8	55,8
2014.	58,7	60,6	57,1
2015.	62,2	63	59,7

## 2. RESULTS AND DISCUSSION OF THE RESEARCH ON MARKET CONCENTRATION IN THE BANKING SECTOR OF THE REPUBLIC OF SRPSKA

### 2.1. Banking sector of the Republic of Srpska

The banking sector of the Republic of Srpska, as of the reporting date 31.12.2020, consists of 8 banks and there were no changes to this in comparison to the end of 2019. The organizational network consists of 284 organizational units of banks based in the Republic of Srpska and 52 organizational units of banks based in the Federation of BiH.

The ownership structure is characterized by majorly private ownership in all banks, with the domestic share capital being predominant in three banks in the Republic of Srpska, and foreign share capital in the other five.

The total share capital amounts to BAM 674.0 million, and consists of 99.2% of private share capital, 0.8% state capital and a very small share of cooperative capital.

An indicator of the banking sector's and each bank's individual success is the efficiency of employees expressed as the ratio of the number of employees and total assets, where a higher amount is, as a rule, an indicator of better efficiency of the bank and the

overall sector. Three banks have assets per employee above BAM 3 million, four banks between 2 and 3 million and one bank has less than BAM 2 million.

Total assets of the banking sector as of 31.12.2020. amount to BAM 9.7 billion and record an increase of BAM 276.4 million or 3% compared to the end of 2019.

Banks in the Republic of Srpska can be divided into three groups according to the size of gross balance sheet assets:

- The group of banks with gross assets over BAM 1,400 million includes three banks with a share of 64.6% in total assets, 61.8% in total loans, 65.7% in total deposits and 68.1% in the total number of employees in the banking sector.
- The group of banks with gross assets of BAM 700 million to 1,400 million includes two banks with a share of 21.3% in total assets, 23.7% in total loans, 20.6% in total deposits and 11.4% in total employees in the banking sector.
- With gross assets below BAM 700 million are three banks that have a share of 14.1% in the total gross assets of the banking sector, 14.5% in total loans, 13.6% in total deposits, and employ 20.5% of the total number of employees in the banking sector.

More detailed data on the operations of individual banks are shown in the following table:

**Table 1.** Data on the financial performances of banks

BANK	As of 31.12.2020.				
	Net assets	Total capital	Total loans	Deposits	Number of employees
Nova banka a.d. Banja Luka	2.317,3	184,0	1.536,0	1.771,3	715
UniCredit Bank a.d. Banja Luka	1.662,2	254,6	980,7	1.274,7	436
NLB Banka a.d. Banja Luka	1.564,1	192,1	879,7	1.237,5	479
Sberbank a.d. Banja Luka	955,5	124,3	679,1	742,1	392
Addiko Bank a.d. Banja Luka	820,9	148,9	622,4	602,5	339
MF banka a.d. Banja Luka	519,7	69,1	383,8	384,8	247
Komercijalna banka a.d. Banja Luka	461,1	62,7	313,1	335,4	163
Naša banka a.d. Bijeljina	207,8	18,6	98,9	166,8	198
	<b>8.508,6</b>	<b>1.054,3</b>	<b>5.493,8</b>	<b>6.515,2</b>	<b>2.969</b>

Source: Banking Agency of the Republic of Srpska, Report on the situation in the banking system of the Republic of Srpska, April 2021, p. 87.

The historical values of market concentration for the period from 2009 to 2018 on the banking market of the Republic of Srpska

measured by the Hirschmann-Herfindahl index are shown in the following table:

**Table 2.** Hirschmann-Herfindahl index values in the period 2008-2018.

Year	Hirschmann-Herfindahl index		
	Assets	Deposits	Loans
2009	1,807	1,858	2,072
2010	1,696	1,750	1,960
2011	1,608	1,614	1,680
2012	1,560	1,558	1,550
2013	1,498	1,530	1,479
2014	1,601	1,655	1,601
2015	1,664	1,681	1,650
2016	1,778	1,817	1,741
2017	1,820	1,853	1,803
2018	1,730	1,748	1,698

Source: Banking Agency of the Republic of Srpska, Report on the situation in the banking system of the Republic of Srpska, April 2021, p. 29.

For the three main business segments (loans, deposits and assets), the value of the HHI index indicates the existence of moderate concentration in all three business segments that are close to the upper limit that separates moderate and high concentration.

The historical values of the concentration rate ( $CR_3$ ) for the three largest banks during the period from 2009 to 2018 in the banking sector of the Republic of Srpska are shown in the following table:

2016.	65,7	67,1	62,3
2017.	66,5	68	62,6
2018.	64,9	65,8	62,1

Izvor: Agencija za bankarstvo Republike Srpske, Izvještaj o stanju u bankarskom sistemu Republike Srpske, april 2021, str. 29.

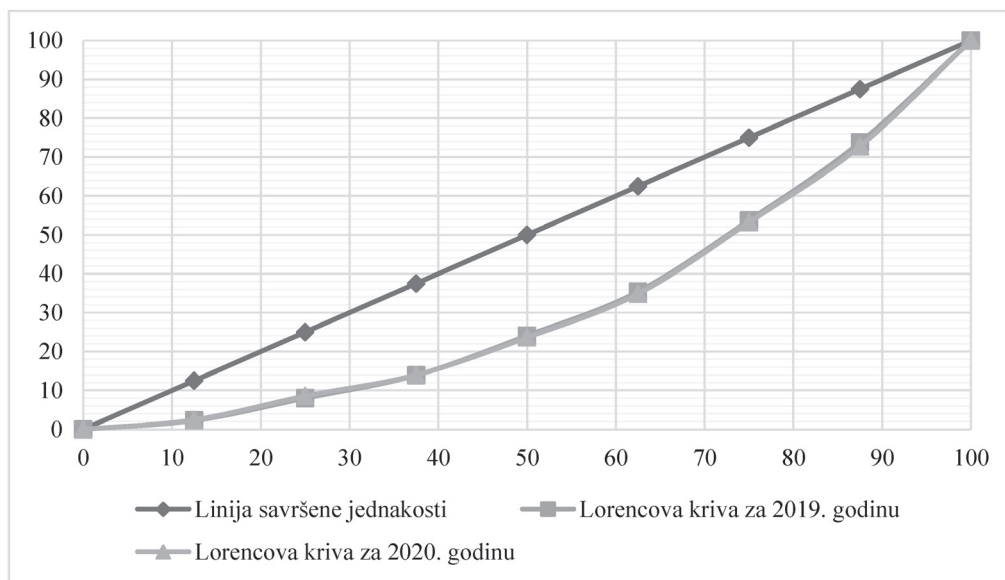
Slično kao i u slučaju mjerenja nivoa koncentracije Hiršman-Herfindal indeksom, vrijednosti koncentracijske stope (CR3) za tri najveće banke ukazuju na postojanje umjerene koncentracije.

## 2.2. Koncentracija aktive sektora u RS

Analizu koncentracije u bankarskom sektoru Republike Srpske

u ovom radu počinjemo analizom koncentracije aktive osam banaka sa sjedištem u Republici Srpskoj. Prva mjera kojom ćemo prikazati koncentraciju aktive jeste Lorencova kriva. Na sljedećem grafikonu dat je prikaz Lorencove krive za kraj 2019. i kraj 2020. godine:

**Grafikon 1.** Lorencova kriva koncentracije aktive u 2019. i 2020. godini



Izvor: kalkulacije autora na osnovu podataka Agencije za bankarstvo Republike Srpske

Kako broj učesnika na bankarskom tržištu Republike Srpske nije mijenjan u posmatranim godinama, to opravdava mogućnost upoređivanja površina između krive savršene jednakosti i Lorencove krive koncentracije. Međutim, kako vidimo sa prethodnog grafikona, površina koja mjeri odstupanje od krive savršene jednakosti tržišne koncentracije u 2019. i 2020. godini nije se mijenjala, tj. dvije posmatrane krive gotovo se poklapaju.

**Tabela 4.** Indeksi koncentracije aktive banaka u RS

Kvartal	2019Q1	2019Q2	2019Q3	2019Q4	2020Q1	2020Q2	2020Q3	2020Q4	2021Q1
HHI	0,171	0,171	0,173	0,173	0,173	0,177	0,174	0,175	0,172
CR4	0,761	0,759	0,760	0,759	0,759	0,767	0,764	0,764	0,758
CR2	0,451	0,454	0,459	0,463	0,462	0,471	0,465	0,468	0,455
H	1,884	1,886	1,880	1,880	1,880	1,868	1,877	1,875	1,884
VL	2,327	2,277	2,323	2,333	2,298	2,374	2,294	2,267	2,216
GINI	0,345	0,344	0,349	0,350	0,349	0,360	0,353	0,355	0,345

Izvor: kalkulacije autora na osnovu podataka Agencije za bankarstvo Republike Srpske

Iz prethodne tabele posmatramo različite koeficijente koncentracije aktive banaka u Republici Srpskoj. Vidimo da je vrijednost najpoznatijeg indeksa prilikom analize koncentracije u bankarskom sektoru (HHI) kroz posmatrani period u rasponu od 0,17 do 0,18. Tumačenje ovog indeksa najčešće govori da su koncentrisane industrije one koje imaju HHI veći od 0,18 i nekoncentrisane one koje imaju vrijednost HHI manju od 0,1. Na osnovu ovoga zaključujemo da je tržište aktive bankarskog sektora Srpske srednje koncentrisano, s tim da je kroz posmatrani period vidljiva težnja ovog indeksa da

U narednom dijelu analize koncentracije aktive banaka uzimaće se prethodno predstavljene pokazatelji koncentracije. Sljedeća tabela daje prikaz različitih pokazatelja koncentracije bankarskog tržišta za period od početka 2019. godine do prvog kvartala 2021. godine:

raste prema nivou od 0,18. Takođe, od trećeg kvartala 2020. godine može se uočiti opadanje HHI koncentracije aktive.

Posmatranjem indeksa koncentracije za učešće dvije najveće banke na bankarskom tržištu vidimo da su na početku perioda „Nova banka“ i „UniCredit Bank“ uzimale oko 45% od ukupne aktive na cjelokupnom tržištu. Takođe, kroz posmatrani period poredak između banaka na tržištu nije se mijenjao, tako da su dvije prethodno pomenute banke kroz čitav period zauzimale pozicije dvije najveće. Maksimalna vrijednost CR za učešće ove dvije banke bila

**Table 3.** Values of the CR<sub>3</sub> concentration ratio in the period 2008-2018.

Concentration ratio CR <sub>3</sub>			
Year	Assets	Deposits	Loans
2009	66.4	66.9	67.8
2010	63.9	64.5	65.8
2011	62.1	62	61.7
2012	60.1	59.7	58.5
2013	58.2	58.8	55.8
2014	58.7	60.6	57.1
2015	62.2	63	59.7
2016	65.7	67.1	62.3
2017	66.5	68	62.6
2018	64.9	65.8	62.1

Source: Banking Agency of the Republic of Srpska, Report on the situation in the banking system of the Republic of Srpska, April 2021, p. 29.

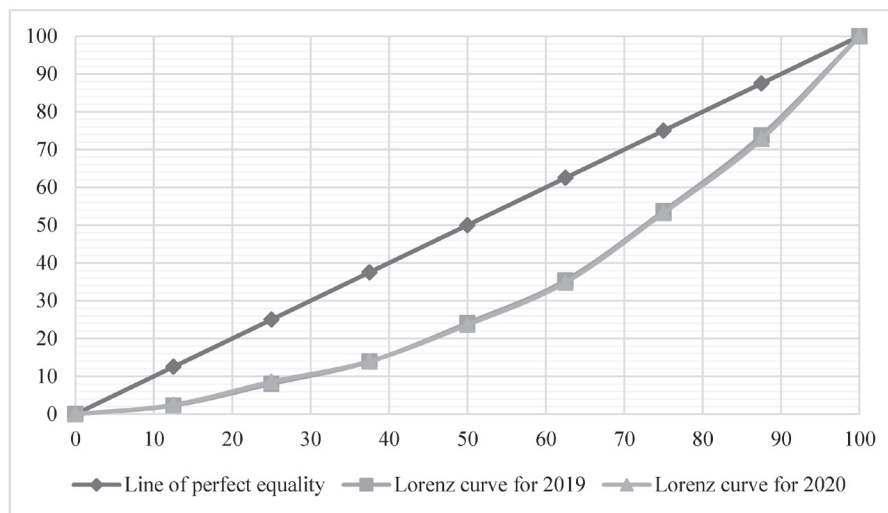
Similar to the measurement of the Hirschmann-Herfindahl concentration level, the concentration rate values (CR<sub>3</sub>) for the three largest banks show the existence of a moderate concentration.

**2.2. Concentration of sector assets in the Republic of Srpska**

In this paper, we begin the analysis of the concentration in the banking sector of the Republic of Srpska by analyzing the concentration of assets of eight banks based in the Republic of Srpska. The first measure by which we will show the concentration of assets is the Lorenz curve. The following chart shows the Lorenz curve for the end of 2019 and the end of 2020:

king sector of the Republic of Srpska by analyzing the concentration of assets of eight banks based in the Republic of Srpska. The first measure by which we will show the concentration of assets is the Lorenz curve. The following chart shows the Lorenz curve for the end of 2019 and the end of 2020:

**Chart 1.** Lorenz asset concentration curve in 2019 and 2020



Source: Author's calculations based on data from the Banking Agency of the Republic of Srpska

As the number of participants in the banking market of the Republic of Srpska has not changed in the observed years, the possibility of comparing the areas between the perfect equality curve and the Lorenz concentration curve is justified. However, as we can see from the previous chart, the area measuring the deviation from the perfect market concentration equality curve in 2019 and 2020 did not change,

ie the two observed curves almost coincide. In the next part of the analysis of the concentration of banks' assets, the previously presented concentration indicators will be used. The following table shows the various indicators of banking market concentration for the period from the beginning of 2019 to the first quarter of 2021:

**Table 1.** Indices of bank assets concentration in the Republic of Srpska

Quarter	2019Q1	2019Q2	2019Q3	2019Q4	2020Q1	2020Q2	2020Q3	2020Q4	2021Q1
HHI	0,171	0,171	0,173	0,173	0,173	0,177	0,174	0,175	0,172
CR4	0,761	0,759	0,760	0,759	0,759	0,767	0,764	0,764	0,758
CR2	0,451	0,454	0,459	0,463	0,462	0,471	0,465	0,468	0,455
H	1,884	1,886	1,880	1,880	1,880	1,868	1,877	1,875	1,884
VL	2,327	2,277	2,323	2,333	2,298	2,374	2,294	2,267	2,216
GINI	0,345	0,344	0,349	0,350	0,349	0,360	0,353	0,355	0,345

Source: Author's calculations based on data from the Banking Agency of the Republic of Srpska

je u drugom kvartalu 2020. godine, kada je njihovo zajedničko učešće u ukupnoj aktivni bankarskog sektora iznosilo oko 47%, dok se nakon ovog kvartala njihovo učešće smanjuje na nivo od 45,5% na početku 2021. godine. CR za četiri najveće banke po učešću u aktivni ostao je stabilan kroz čitav posmatrani period i iznosio je oko 76%, uz neznatne oscilacije.

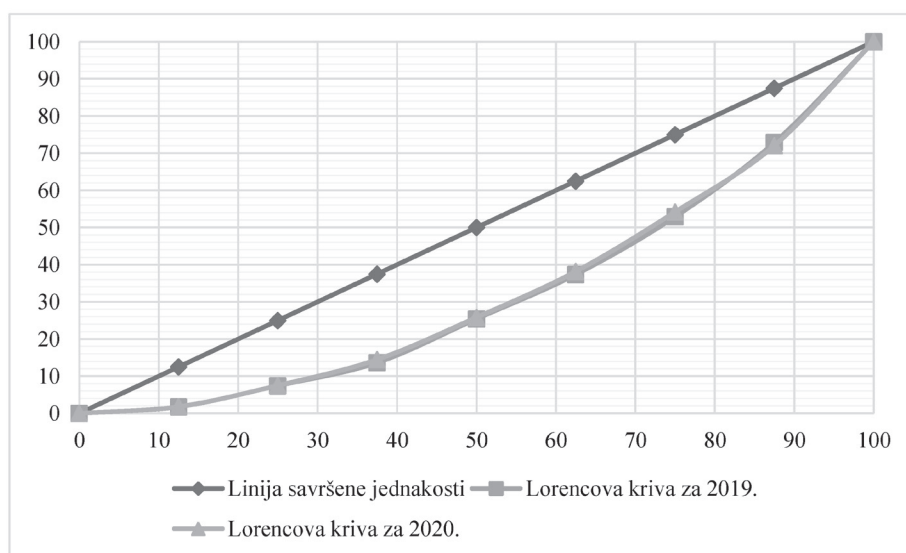
Iz posmatrane tabele imamo uvid i u ostale pokazatelje tržišne koncentracije. Vidimo da je vrijednost mjere entropije (H) kroz posmatrani period na nivou od 1,8. Budući da se vrijednost ovog koeficijenta kreće između 0 i prirodnog logaritma ukupnog broja banaka (2,079), može se reći da je, prema ovom pokazatelju koncentracije, tržište aktive banaka u Srpskoj ostalo stabilno. Takođe,

vidimo da je varijansa prirodnih logaritama kroz posmatrani period uzimala vrijednost između 2,2 i 2,3. Kao i kod mjere entropije, što je varijansa veća, to je veća i disperzija učešća, pa što je koncentracija veća, ovaj pokazatelj je manji. Iz prethodne tabele može se uočiti da je vrijednost u posljednja tri kvartala blago opala. Vrijednost Džinijevog koeficijenta, kao interpretacije Lorencove krive, kreće se u intervalu od 0,345 do 0,360. Takođe, u posljednja tri kvartala vrijednost ovog koeficijenta blago se smanjuje.

### 2.3. Koncentracija kredita

Na sljedećem grafikonu prikazana je Lorencova kriva kao mjera koncentracije na tržištu kredita u Republici Srpskoj na kraju 2019. i 2020. godine:

**Grafikon 2.** Lorencova kriva koncentracije kredita u 2019. i 2020. godini



Izvor: kalkulacije autora na osnovu podataka Agencije za bankarstvo Republike Srpske

Sa prethodnog grafikona ne može se uočiti značajno odstupanje između koncentracije u 2019. i 2020. godini, iako se vizuelno uočava blago smanjenje površine između dvije krive u 2020. godini u odnosu na prethodnu godinu.

Prikaz ostalih pokazatelja koncentracije na tržištu kredita kroz posmatrani period predstavljen je u sljedećoj tabeli:

**Tabela 5.** Indeksi koncentracije kredita banaka u RS

Kvartal	2019Q1	2019Q2	2019Q3	2019Q4	2020Q1	2020Q2	2020Q3	2020Q4	2021Q1
HHI	0,170	0,170	0,174	0,173	0,172	0,173	0,173	0,172	0,172
CR4	0,744	0,741	0,749	0,746	0,746	0,746	0,743	0,742	0,744
CR2	0,464	0,462	0,471	0,471	0,467	0,467	0,462	0,458	0,458
H	1,889	1,889	1,874	1,877	1,881	1,881	1,882	1,884	1,884
VL	2,373	2,451	2,636	2,687	2,621	2,519	2,555	2,575	2,532
GINI	0,341	0,339	0,352	0,349	0,346	0,347	0,345	0,342	0,343

Izvor: kalkulacije autora na osnovu podataka Agencije za bankarstvo Republike Srpske

HHI indeks, kako se može vidjeti u prethodnoj tabeli, uzima vrijednost nešto veću od 0,17, ali manju od 0,18, što ukazuje na to da tržište kredita na osnovu ovog pokazatelja spada u srednje koncentrisana tržišta. Vrijednost HHI pokazatelja dostiže najveću vrijednost od 0,174 u trećem kvartalu 2019. godine, dok je u prvom kvartalu 2021. godine vrijednost ovog indeksa 0,172.

CR za dvije najveće banke po učešću u kreditima („Nova banka“ i „UniCredit Bank“) govori da je njihovo učešće u ukupno plasiranim kreditima kroz posmatrani period bilo stabilno, na nivou od oko 46%, dok je u trećem i četvrtom kvartalu 2019. godine učešće ove dvije banke u ukupno plasiranim kreditima bilo preko 47%, što je ne previše značajan rast. S druge strane, CR za četiri najveće banke

na bankarskom tržištu Republike Srpske prema učešću u ukupno plasiranim kreditima iznosi oko 74% kroz posmatrani period.

Kako se može vidjeti iz prethodno prikazane tabele, koeficijent mjere entropije ostaje na stabilnom nivou od oko 1,8 kroz čitav posmatrani period koncentracije kredita, dok varijansa prirodnih logaritama tržišnih učešća pokazuje određene promjene u koncentraciji tržišnih učešća u ukupno plasiranim kreditima, tj. varijansa se kreće u rasponu od 2,3 do 2,7. Do drugog kvartala 2020. godine vidljivo je smanjenje koncentracije, dok je nakon ovog kvartala primjetno smanjenje raspršenosti, odnosno povećanje koncentracije. Vrijednost Džinijevog koeficijenta kreće se na nivou od oko 0,34, što opet ovo tržište svrstava u srednje koncentrisana tržišta.



From the previous table, we observe different coefficients of concentration of bank assets in the Republic of Srpska. We see that the value of the most well-known index when analyzing the concentration in the banking sector (HHI) over the observed period ranges from 0.17 to 0.18. Interpretation of this index most often shows that concentrated industries are those with an HHI greater than 0.18 and non-concentrated ones are those whose HHI values come up to less than 0.1. Based on this, we conclude that the assets market of the banking sector of the Republic of Srpska is moderately concentrated, with a visible tendency in the observed period for this index to grow towards the level of 0.18. Also, from the third quarter of 2020, a decline in the HHI concentration of assets can be observed.

Looking at the concentration index for the participation of the two largest banks in the banking market, we see that at the beginning of the period, “Nova banka” and “UniCredit Bank” took about 45% of total assets on the market. Also, during the observed period, the order between the banks on the market did not change, so the two previously mentioned banks occupied the positions of the two largest participants throughout the period. The maximum value of CR for the participation of these two banks was in the second quarter of 2020, when their joint share in the total assets of the banking sector was about 47%, while after this quarter their share decreased to 45.5%

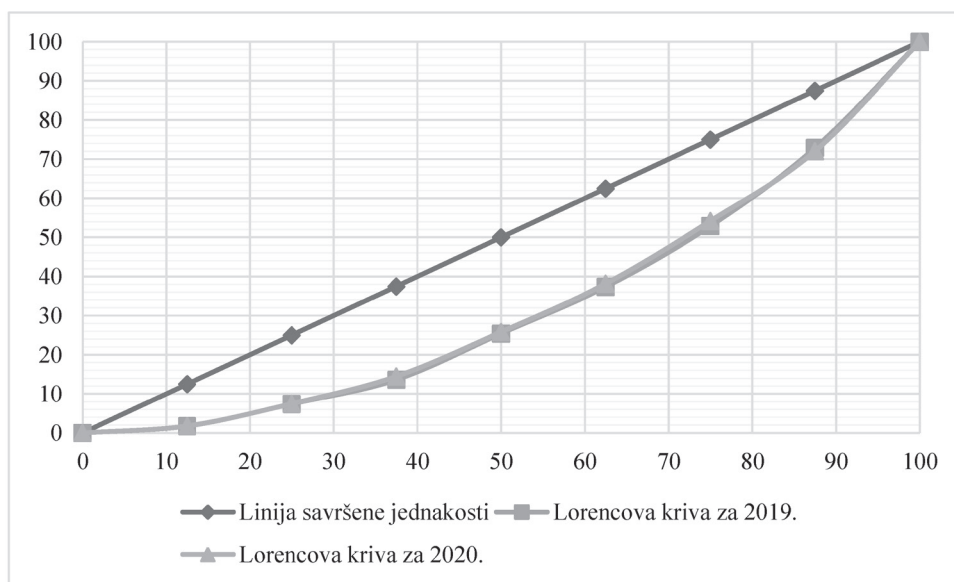
at the beginning of 2021. The CR for the four largest banks in terms of shares in assets remained stable throughout the observed period and amounted to about 76% with slight oscillations.

From the observed table, we have an insight into other indicators of market concentration. We see that the value of the measure of entropy (H) during the observed period is at the level of 1.8. Since the value of this coefficient ranges between 0 and the natural logarithm of the total number of banks (2,079), it can be said that according to this indicator of concentration, the market of bank assets in the Republic of Srpska remained stable. Also, we see that the variance of natural logarithms during the observed period took a value between 2.2 and 2.3. As with the entropy measure, the greater the variance, the greater the dispersion of participation, so the higher the concentration, the lower this indicator. From the table it can be noticed that the value has slightly decreased in the last three quarters. The value of the Gini coefficient, as an interpretation of the Lorenz curve, ranges from 0.345 to 0.360. Additionally, in the last three quarters, the value of this coefficient has slightly decreased.

### 2.3. Loan concentration

The following chart shows the Lorenz curve as a measure of concentration in the loan market in the Republic of Srpska at the end of 2019 and 2020:

Chart 2. Lorenz curve of loan concentration in 2019 and 2020



Source: Author's calculations based on data from the Banking Agency of the Republic of Srpska

The previous chart does not show a significant deviation between the concentration in 2019 and 2020, although visually there is a slight decrease in the area between the two curves in 2020 compared to the previous year.

The overview of other indicators of concentration on the credit market during the observed period is presented in the following table:

Table 2. Indices of concentration of bank loans in the Republic of Srpska

Quarter	2019Q1	2019Q2	2019Q3	2019Q4	2020Q1	2020Q2	2020Q3	2020Q4	2021Q1
HHI	0,170	0,170	0,174	0,173	0,172	0,173	0,173	0,172	0,172
CR4	0,744	0,741	0,749	0,746	0,746	0,746	0,743	0,742	0,744
CR2	0,464	0,462	0,471	0,471	0,467	0,467	0,462	0,458	0,458
H	1,889	1,889	1,874	1,877	1,881	1,881	1,882	1,884	1,884
VL	2,373	2,451	2,636	2,687	2,621	2,519	2,555	2,575	2,532
GINI	0,341	0,339	0,352	0,349	0,346	0,347	0,345	0,342	0,343

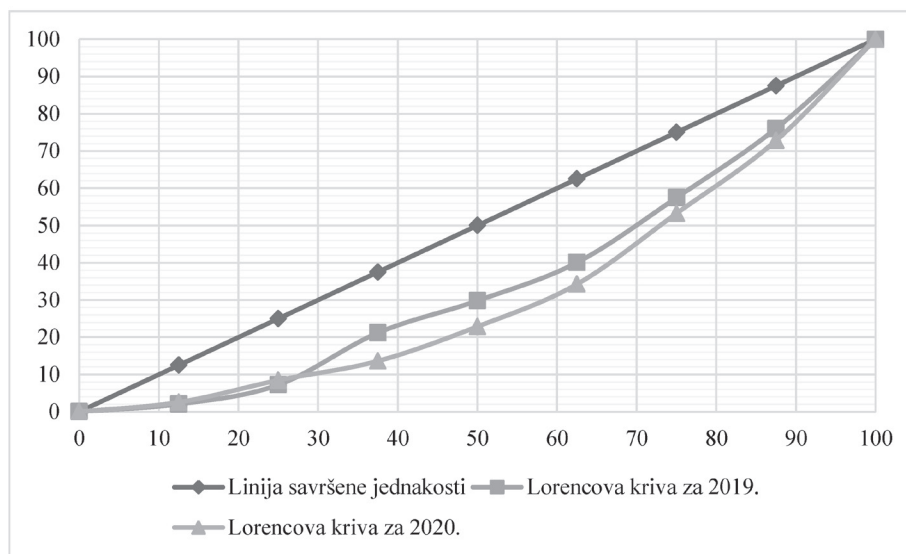
Source: Author's calculations based on data from the Banking Agency of the Republic of Srpska

## 2.4. Koncentracija depozita

Analizu koncentracije na bankarskom tržištu Republike Srpske zaključujemo analizom koncentracije depozita kroz posmatrani

period. Na naredom grafikonu dat je prikaz Lorencovih krivih za kraj 2019. i kraj 2020. godine:

**Grafikon 3.** Lorencova kriva koncentracije depozita u 2019. i 2020. godini



Izvor: kalkulacije autora na osnovu podataka Agencije za bankarstvo Republike Srpske

Prethodno prikazane Lorencove krive svjedoče o povećanoj koncentraciji depozita banaka na kraju 2020. godine u odnosu na posljednji kvartal 2019. godine. Vizuelno se može uočiti udaljšavanje krive u 2020. godini od krive savršene jednakosti, što svjedoči o povećanoj koncentraciji depozita u 2020. godini. Posmatranjem drugih koe-

ficijentata koncentracije u narednom dijelu može se i kvantitativno izraziti ovaj odnos koncentracije.

Prikaz ostalih kvantitativnih pokazatelja kojima smo mjerili koncentraciju u bankarskom sektoru u ovom radu dat je u narednoj tabeli:

**Tabela 6.** Indeksi koncentracije depozita banaka u RS

Kvartal	2019Q1	2019Q2	2019Q3	2019Q4	2020Q1	2020Q2	2020Q3	2020Q4	2021Q1
HHI	0,173	0,173	0,175	0,163	0,175	0,180	0,176	0,177	0,173
CR4	0,768	0,765	0,767	0,702	0,767	0,780	0,772	0,771	0,763
CR2	0,453	0,457	0,464	0,425	0,463	0,476	0,464	0,468	0,450
H	1,878	1,882	1,873	1,912	1,874	1,855	1,871	1,870	1,882
VL	2,334	2,258	2,377	2,319	2,296	2,444	2,297	2,275	2,204
GINI	0,349	0,348	0,355	0,293	0,354	0,370	0,357	0,359	0,346

Izvor: kalkulacije autora na osnovu podataka Agencije za bankarstvo Republike Srpske

HHI pokazuje da je kroz posmatrani period koncentracija mjerena indeksom od 0,17 do 0,18. U posljednjem kvartalu 2019. godine iznosio je 0,163, što je minimalna vrijednost ovog indeksa u posmatranom periodu, dok je u drugom kvartalu 2020. godine vrijednost HHI jednaka 0,180. Ostali kvartali, posmatrano kroz ovaj pokazatelj, relativno su stabilni kada se posmatra koncentracija depozita. Može se uočiti da bankarsko tržište Republike Srpske, i kada se posmatraju depoziti, spada u srednje koncentrisana tržišta kada se koncentracija posmatra kroz HHI, dok je vidljiva tendencija rasta koncentracije prema ovom pokazatelju.

Racio koncentracije kada se posmatraju dvije najveće banke prema učešću u depozitima kreće se u rasponu od 42,5% u prvom kvartalu 2019. godine do 47,6% u drugom kvartalu 2020. godine. Takođe, nakon drugog kvartala 2020. godine vidi se smanjenje učešća dvije najveće banke („Nova banka“ i „UniCredit Bank“) u ukupnim depozitima. Racio koncentracije za četiri najveće banke prema učešću u ukupnim depozitima kreće se u rasponu od 70,2% na kraju 2019. godine do 78% u drugom kvartalu 2020. godine.

Mjera entropije pokazuje relativno stabilan nivo od 1,8, izuzev posljednjeg kvartala 2019. godine, kada se entropija mjerila nivoom od

1,912. Kao i kod prethodnih pokazatelja, može se uočiti povećanje raspršenosti, tj. smanjenje koncentracije u posljednjem kvartalu 2019. godine. Posmatranjem varijanse prirodnih logaritama može se uočiti povećanje koncentracije nakon drugog kvartala 2020. godine, kada je prema ovom pokazatelju bilježena najveća raspršenost prema učešću u depozitima. Džinijev koeficijent kreće se u rasponu od 0,293 u posljednjem kvartalu 2019. godine, kada je bilježena najmanja koncentracija, do nivoa od 0,370 u drugom kvartalu.

## ZAKLJUČAK

Istorijske vrijednosti tržišne koncentracije za period od 2009. do 2018. godine na bankarskom tržištu Republike Srpske mjerene su Hiršman-Herfindalovim indeksom. Za tri osnovna segmenta poslovanja (kredit, depoziti i aktiva) vrijednosti HHI indeksa ukazali su na postojanje umjerene koncentracije kod sva tri segmenta poslovanja koji su blizu gornje granice koja dijeli umjerenu i visoku koncentraciju. Slično tome, istorijske vrijednosti koncentracijske stope (CR3) za tri najveće banke, tokom perioda od 2009. do 2018. godine, u

The HHI index, as can be seen in the previous table, takes a value slightly higher than 0.17 but less than 0.18, which indicates that the loan market belongs to the moderately concentrated markets. The value of the HHI indicator reaches the highest value of 0.174 in the third quarter of 2019, while in the first quarter of 2021 the value of this index is 0.172.

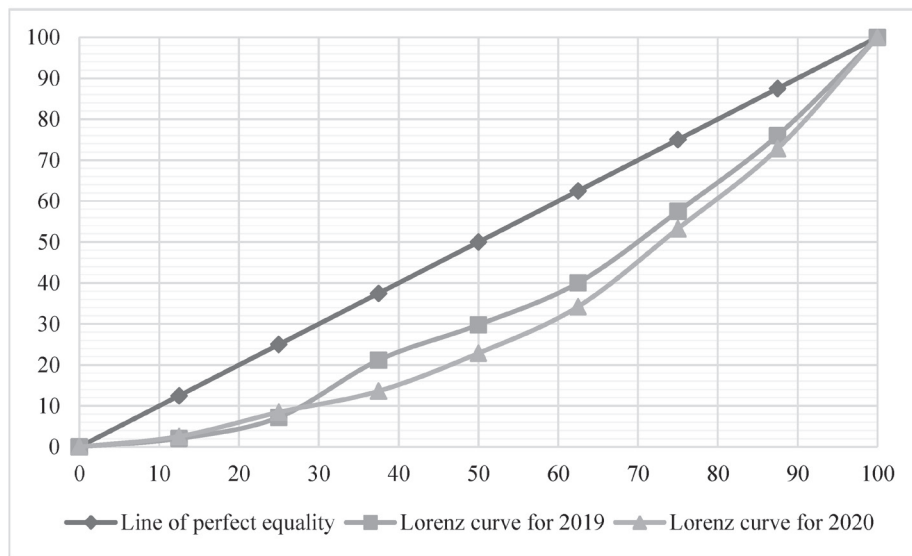
The CR for the two largest banks in terms of participation in loans (“Nova banka” and “UniCredit Bank”) says that their share in total loans was stable over the observed period, at around 46%, while in the third and fourth quarters of 2019 The share of these two banks in total loans took over 47%, which is not too significant of a growth trend. On the other hand, the CR for the four largest banks on the banking market of the Republic of Srpska, according to the share in the total placed loans, amounts to about 74% during the observed period.

As is shown in the table above, the entropy coefficient remains at a stable level of about 1.8 throughout the observed period of loan concentration. While the variance of natural logarithms of market shares shows certain changes in the concentration of market shares in total loans, or in other words the variance ranges from 2.3 to 2.7. Until the second quarter of 2020, a decrease in concentration is visible, while after this quarter there is a noticeable decrease in dispersion, an increase in concentration that is. The value of the Gini coefficient is around 0.34, which again classifies this market as a moderately concentrated market.

**2.4. Deposit concentration**

We conclude the analysis of the concentration on the banking market of the Republic of Srpska through an analysis of the concentration of deposits over the observed period. The following chart shows the Lorenz curves for the end of 2019 and the end of 2020:

*Chart 3. Lorenz deposit concentration curve in 2019 and 2020*



*Source: Author's calculations based on data from the Banking Agency of the Republic of Srpska*

The previously presented Lorenz curves testify to the increased concentration of bank deposits at the end of 2020 compared to the last quarter of 2019. The deviation of the curve in 2020 from the perfect equality curve can be seen visually, which testifies to the increased concentration of deposits in 2020. By observing other

concentration coefficients in the following section, this concentration ratio can be presented quantitatively.

An overview of other quantitative indicators by which we measured the concentration in the banking sector in this paper is given in the following table:

**Table 3. Concentration indices of bank deposits in the Republic of Srpska**

Quarter	2019Q1	2019Q2	2019Q3	2019Q4	2020Q1	2020Q2	2020Q3	2020Q4	2021Q1
HHI	0,173	0,173	0,175	0,163	0,175	0,180	0,176	0,177	0,173
CR4	0,768	0,765	0,767	0,702	0,767	0,780	0,772	0,771	0,763
CR2	0,453	0,457	0,464	0,425	0,463	0,476	0,464	0,468	0,450
H	1,878	1,882	1,873	1,912	1,874	1,855	1,871	1,870	1,882
VL	2,334	2,258	2,377	2,319	2,296	2,444	2,297	2,275	2,204
GINI	0,349	0,348	0,355	0,293	0,354	0,370	0,357	0,359	0,346

*Source: Author's calculations based on data from the Banking Agency of the Republic of Srpska*

HHI shows that during the observed period the concentration ranged from 0.17 to 0.18. The last quarter of 2019 was 0.163, which is the minimum value of this index in the observed period, while the second quarter of 2020, the value of HHI is equal to 0.180. Other quarters observed through this indicator are relatively stable when the concentration of deposits is observed. It can be noticed that the banking market of the Republic of Srpska, even when deposits are observed, belongs to the markets with medium concentration while

a tendency of a concentration increase according to this indicator is visible when it is observed through HHI.

Looking at the two largest banks according to their share in deposits, the concentration ratio ranges from 42.5% in the first quarter of 2019 to 47.6% in the second quarter of 2020. Also, after the second quarter of 2020, there is a decrease in the share of the two largest banks (“Nova banka” and “UniCredit Bank”) in total deposits. The concentration ratio for the four largest banks according to the share

bankarskom sektoru Republike Srpske, ukazale su na postojanje umjerene koncentracije.

Kako broj učesnika na bankarskom tržištu Republike Srpske nije mijenjan u posmatranim godinama, to je opravdalo mogućnost upoređivanja površina između krive savršene jednakosti i Lorenbove krive koncentracije. Površina koja mjeri odstupanje od krive savršene jednakosti tržišne koncentracije u 2019. i 2020. godini nije se mijenjala, tj. dvije posmatrane krive gotovo su se poklapale. Na osnovu ovoga zaključujemo da je tržište aktive bankarskog sektora Republike Srpske srednje koncentrisano, s tim da je kroz posmatrani period vidljiva težnja ovog indeksa da raste prema nivou od 0,18, odnosno prema više koncentrisanom tržištu.

Posmatranjem indeksa koncentracije za učešće dvije najveće banke na bankarskom tržištu vidimo da su na početku perioda „Nova banka“ i „UniCredit Bank“ uzimale oko 45% od ukupne aktive na cjelokupnom tržištu. Takođe, kroz posmatrani period poredak između banaka na tržištu nije se mijenjao, tako da su dvije prethodno pomenute banke kroz čitav period zauzimale pozicije dvije najveće.

Ukoliko posmatramo tržište kredita bankarskog sektora Republike Srpske, ne može se uočiti značajno odstupanje između koncentracije u 2019. i 2020. godini. Kada uzmemo u obzir i druge pokazatelje koncentracije, tržište kredita možemo svrstati u srednje koncentrisana tržišta.

U slučaju koncentracije depozita, vrijednosti Lorenbove krive svjedoče o povećanoj koncentraciji depozita banaka na kraju 2020. godine u odnosu na posljednji kvartal 2019. godine. Može se zaključiti da bankarsko tržište Republike Srpske, i kada se posmatraju depoziti, spada u srednje koncentrisana tržišta kada se koncentracija posmatra kroz HHI, s tim da je primjetna tendencija rasta koncentracije.

## IZVORI

1. Agencija za bankarstvo Republike Srpske (2021). Izvještaj o stanju u bankarskom sistemu Republike Srpske.
2. Alihodžić, A. (2019). *Tržišna koncentracija banaka i nezaposlenost: Evidencija na tržištu banaka Bosne i Hercegovine i Srbije*. Ekonomski fakultet, Univerzitet u Zenici.
3. Begović, A. (2012). Konkurentnost bankarskog sektora Republike Srpske. *Financing*, naučni časopis za ekonomiju, 04/12. Banja Luka.
4. Demirguc-Kunt, A., Levine, R. (2000). *Bank Concentration: Cross-Country Evidence*. World Bank Global Policy Forum.
5. Drašković, B., Domazet, I. (2008). *Koncentracija tržišne moći kao izraz nesavršenosti tržišta*. Institut ekonomskih nauka, Beograd.
6. Dumičić, K., Pavković, A., Akalović, A. J. (2012). Mjerenje koncentracije u bankarstvu u Republici Hrvatskoj. *Zbornik Ekonomskog fakulteta u Zagrebu*, Vol. 10, No. 2.
7. Hauge, R. L., Phan, J. (2010). *The Effect of Market Structure on Banks' Interest Rate Spreads, An Empirical Analysis of the Norwegian Bank Market*. Norges Handelshoyskole.
8. Jović, D. (2006). *Koncentracija i konkurencija u bankarskom sektoru Bosne i Hercegovine*. Centralna banka Bosne i Hercegovine.
9. Kostić, M. (2008). *Mjerenje koncentracije ponude grane*. Ekonomski fakultet, Kragujevac.
10. Leuvensteijn, M., Sørensen, K. C., Bikker, J. A., Rixtel, A. (2008). *Impact of bank competition on the interest rate pass-through in the euro area*. Unidad de Publicaciones, Banco de España.
11. Lipczynski, J., Wilson, J. (2001). *Industrial Organisation – An Analysis of Competitive Markets*. Prentice Hall, Harlow, UK.
12. Naym, J. (2018). *Competition and Concentration in Banking Sector: Evidence from Bangladesh*. Eastern Illinois University.
13. Owen, A. L., Pereira, J. M. (2018). *Bank concentration, competition, and financial inclusion*. Hamilton College, United States.
14. Stojmenović, M. (2021). Analiza tržišne koncentracije u bankarskom sektoru Republike Srbije. *Bankarstvo*, 2021, vol. 50.
15. Šonje, V. (1994). *Tržišne koncentracije u hrvatskoj privredi: Stanje 1992. godine i promjene 1989–1992. godine. Privredna kretanja i ekonomska politika*. Ekonomski institut, Zagreb.
16. Tipurić, D., Kolaković, M., Dumičić, K. (2002). Istraživanje promjena u koncentraciji hrvatske bankarske industrije 1993–2000. *Ekonomski pregled*, Vol. 53, No. 5–6.
17. Tushaj, A. (2010). *Market concentration in the banking sector: Evidence from Albania*. EconStor. BERG Working Paper Series on Government and Growth No. 73.

in total deposits ranges from 70.2% at the end of 2019 to 78% in the second quarter of 2020.

The measure of entropy shows a relatively stable level of 1.8 except for the last quarter of 2019 when entropy was measured at the level of 1,912. As with the previous indicators, an increase in dispersion can be observed, and as such a decrease in concentration in the last quarter of 2019 as well. Observing the variance of natural logarithms, we can see an increase in concentration after the second quarter of 2020, when, according to this indicator, the greatest dispersion was recorded in terms of participation in deposits. The Gini coefficient ranges from 0.293 in the last quarter of 2019, when the lowest concentration was recorded, up to the level of 0.370 in the second quarter.

## CONCLUSION

Historical values of market concentration for the period from 2009 to 2018 on the banking market of the Republic of Srpska were measured by the Hirschmann-Herfindahl index. For the three main business segments (loans, deposits and assets), the values of the HHI index indicated the existence of moderate concentration; in all three business segments that are close to the upper limit between moderate and high concentration. Similarly, the historical values of the concentration rate ( $CR_3$ ) for the three largest banks, during the period from 2009 to 2018 in the banking sector of the Republic of Srpska, showed moderate concentration too.

As the number of participants in the banking market of the Republic of Srpska has not changed in the observed years, this has justified the possibility of comparing the areas between the perfect equality curve and the Lorenz concentration curve. The area measuring the deviation from the perfect market concentration equality curve in 2019 and 2020 did not change, so the two observed curves almost coincided. Based on this, we conclude that the assets market of the banking sector of the Republic of Srpska is moderately concentrated, with the tendency of this index to grow towards the level of 0.18, that is to say towards a more concentrated market, visible during the observed period.

Looking at the concentration index for the participation of the two largest banks in the banking market, we see that at the beginning of the observed period, "Nova banka" and "UniCredit Bank" took about 45% of total assets in the overall market. Also, during this period, the order between the banks on the market did not change, so that the two previously mentioned banks occupied the positions of the two major participants throughout the period.

If we look at the loan market of the banking sector of the Republic of Srpska, we cannot see a significant deviation between the concentration in 2019 and 2020. When we take into account other indicators of concentration, the loan market can be classified as a medium-concentrated market.

In the case of the concentration of deposits, the values of the Lorenz curve testify to the increased concentration of bank deposits at the end of 2020 compared to the last quarter of 2019. It can be concluded that the banking market of the Republic of Srpska, even when deposits are observed, belongs to markets that have

medium concentration, with the observations from the HHI, revealing a noticeable tendency of a concentration increase.

## LITERATURE

1. Agencija za bankarstvo Republike Srpske. (2021). Izvještaj o stanju u bankarskom sistemu Republike Srpske.
2. Alihodžić, A. (2019). Tržišna koncentracija banaka i nezaposlenost: Evidencija na tržištu banaka Bosne i Hercegovine i Srbije. Ekonomski fakultet, Univerzitet u Zenici.
3. Begović, A. (2012). Konkurentnost bankarskog sektora Republike Srpske. *Financing, naučni časopis za ekonomiju*, 04/12. Banja Luka.
4. Demircuc-Kunt, A., Levine, R. (2000). Bank Concentration: Cross-Country Evidence. *World Bank Global Policy Forum*.
5. Drašković, B., Domazet, I. (2008). Koncentracija tržišne moći kao izraz nesavršenosti tržišta. *Institut ekonomskih nauka, Beograd*.
6. Dumičić, K., Pavković, A., Akalović, A. J. (2012). Mjerenje koncentracije u bankarstvu u Republici Hrvatskoj. *Zbornik Ekonomskog fakulteta u Zagrebu*, Vol. 10, No. 2.
7. Hauge, R. L., Phan, J. (2010) The Effect of Market Structure on Banks' Interest Rate Spreads, *An Empirical Analysis of the Norwegian Bank Market. Norges Handelshoyskole*.
8. Jović, D. (2006). Koncentracija i konkurencija u bankarskom sektoru Bosne i Hercegovine. *Centralna banka Bosne i Hercegovine*.
9. Kostić, M. (2008). Mjerenje koncentracije ponude grane. *Ekonomski fakultet, Kragujevac*
10. Leuvensteijn, M., Sørensen, K. C., Bikker, J. A., Rixtel, A. (2008). Impact of bank competition on the interest rate pass-through in the euro area. *Unidad de Publicaciones, Banco de España*.
11. Lipczynski, J., Wilson, J. (2001). *Industrial Organisation – An Analysis of Competitive Markets*. Prentice Hall, Harlow, UK.
12. Naym, J. (2018). *Competition and Concentration in Banking Sector: Evidence from Bangladesh*. Eastern Illinois University.
13. Owen, A. L., Pereira, J. M. (2018). Bank concentration, competition, and financial inclusion. *Hamilton College, United States*.
14. Stojmenović, M. (2021). Analiza tržišne koncentracije u bankarskom sektoru Republike Srbije. *Bankarstvo, 2021*, vol. 50.
15. Šonje, V. (1994). Tržišne koncentracije u hrvatskoj privredi: Stanje 1992. godine i promjene 1989.-1992. godine. *Privredna kretanja i ekonomska politika*. Ekonomski institut, Zagreb.
16. Tipurić, D., Kolaković, M., Dumičić, K. (2002). Istraživanje promjena u koncentraciji hrvatske bankarske industrije 1993.-2000. *Ekonomski pregled*, Vol. 53, No. 5-6.
17. Tushaj, A. (2010). Market concentration in the banking sector: Evidence from Albania. *EconStor. BERG Working Paper Series on Government and Growth*, No. 73.



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# Višestruka imputacija kao metod eliminacije nedostajućih podataka u SPSS-u

## Multiple imputations as a method of elimination of missing data in SPSS

### Rezime

Nedostajući podaci javljaju se u svim oblastima istraživanja, a naročito u oblasti društvenih nauka. Kao takvi, mogu smanjiti statističku moć istraživanja i proizvesti pristrasne procjene, što može rezultirati neadekvatnim zaključcima. U ovom radu dat je pregled obrazaca i mehanizama po kojima nedostajući podaci mogu da nedostaju u istraživanju. Pored navedenog, u radu su predstavljene tradicionalne i savremene metode koje se mogu koristiti za eliminaciju nedostajućih podataka i ukazuje se na prednosti i nedostatke jedne i druge grupe metoda. Zbog visoke pristrasnosti pri procjeni parametara koju izazivaju tradicionalne metode tretmana nedostajućih podataka, kao što su metode brisanja nedostajućih podataka u cijelini ili u paru, metode jednostruke imputacije, preporučuje se primjena savremenih metoda, kao što je metoda višestruke imputacije. S obzirom na to, u radu je dat primjer sprovođenja višestruke imputacije u SPSS programu.

**Cljučne riječi:** nedostajući podaci, MCAR, MAR, NMAR, višestruka imputacija, SPSS.

### Abstract

Missing data appear in all areas of research, and the client is in the field of social sciences. As such, they can reduce the statistical power of research and produce biased estimates, which can result in inadequate conclusions. This paper provides an overview of the patterns and mechanisms by which missing data may be missing in research. In addition to the above, the paper presents traditional and modern methods that can be used to eliminate missing data and points out the advantages and disadvantages of both groups of methods. It is recommended to use modern methods - such as multiple imputation methods, due to the high bias in the assessment of parameters caused by traditional methods of missing data treatment, such as methods of deleting missing data in whole or in pairs or single imputation methods. With that in mind, this paper gives an example of conducting multiple imputation in the SPSS program.

**Keywords:** missing data, MCAR, MAR, NMAR, multiple imputation, SPSS

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## UVOD

U različitim oblastima istraživanja prikupljaju se različiti podaci u cilju donošenja određenih zaključaka na osnovu analize prikupljenih podataka u uzorku. Zajednički sadržalac svih istraživanja, bez obzira na to o kojoj naučnoj oblasti se radi, jesu nedostajući podaci. Nedostajući podaci najčešće se definišu kao vrijednosti koje nisu evidentirane ili zabilježene za određenu posmatranu varijablu. Kao takvi, u velikoj mjeri otežavaju obradu i analizu prikupljenih podataka, a time posljedično utiču i na zaključke koji se donose na osnovu uzorka. Uzimajući u obzir navedeno, predmet ovog rada jeste problem nedostajućih podataka u istraživanju. Cilj rada je predstaviti praktičnu primjenu metode višestruke imputacije, kao jedne od savremenih metoda za rješavanje problema nedostajućih podataka, u SPSS programu.

## 1. PREGLED LITERATURE

### 1.1. Pojam, obrasci i mehanizmi nedostajućih podataka

Nedostajući podaci (engl. Missing data) definišu se kao vrijednosti podataka koji nisu pohranjeni za datu posmatranu varijablu. Kao takvi, uobičajna su pojava u gotovo svim oblastima istraživanja, a naročito u oblasti društvenih nauka (Kang, 2013). Nedostajući podaci se, prema Graham i saradnicima (Graham, Cumsile, Elek-Fisk, 2003), javljaju iz dva razloga. Jedan razlog je da ispitanici koji učestvuju u određenom istraživanju ne odgovaraju iz neodređenog

razloga na neka pitanja. Drugi razlog je taj što zbog osipanja uzorka u longitudinalnim istraživanjima dolazi do pojave nedostajućih čitavih kompleta podataka.

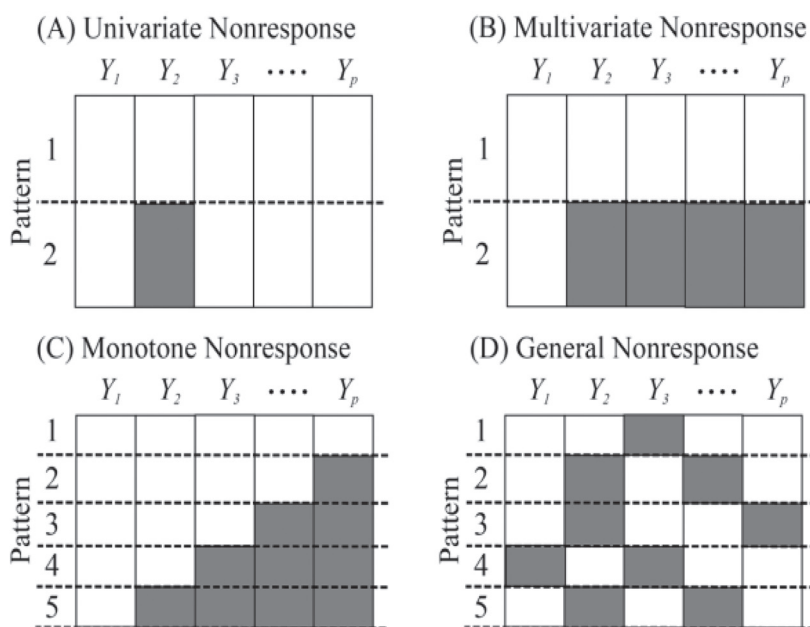
Problematika nedostajućih podataka zavisi od samog tipa podataka. Ukoliko su podaci nominalne kategorije, tim je teže predvidjeti, zamijeniti ili nadomjestiti nedostajuće podatke. Pored samog oblika distribucije i tipa nedostajućih podataka, važan faktor je i veličina uzorka u istraživanju, a time i količina nedostajućih podataka, broj i tip ostalih prikupljenih podataka itd. (Oblaković, Sokolovska, Dinić, 2015).

Kada je riječ o količini nedostajućih podataka, u literaturi ne postoji utvrđena granica u pogledu prihvatljivog postotka podatka koji nedostaju u uzorku, a koji ne bi uticao na statističke zaključke izvedene iz tog uzorka. Shodno tome, Shcafer (1999) je utvrdio da procenat nedostajućih podataka u uzorku od 5% ili manje ne utiče na zaključke koji se donesu na osnovu takvog uzorka. Sa druge strane, Bennett (2001) ističe da je statistička analiza najvjerovatnije pristrasna ukoliko u uzorku nedostaje više od 10% podataka. Tabachnick i Fidell (2012) utvrdili su da mehanizmi i obrasci nedostajućih podataka imaju veći uticaj na rezultate istraživanja nego udio podataka koji nedostaje u uzorku.

Obrasci podataka koji nedostaju mogu se podijeliti na:

- jednovarijantne i multivarijantne obrasce,
- monotone i nemonotone obrasce,
- opšti obrazac.

Slika 1. Obrasci nedostajućih podataka



Izvor: Howard, 2013.

Jednovarijantni obrasci nedostajućih podataka označavaju situaciju u kojoj se podaci koji nedostaju pojavljuju samo na jednoj varijabli, što je predstavljeno panelom A na slici broj 1. Ukoliko se nedostajući podaci pojavljuju na više varijabli, tada govorimo o multivarijantnom obrascu nedostajućih podataka, što se vidi sa panela B. Ako podatak za određenu varijablu nedostaje ne samo u određenoj vremenskoj tački nego i u svim kasnijim vremenskim prilikama, za obrazac podataka koji nedostaju za datu varijablu kaže se da je monotoni, što se vidi na panelu C. Sa druge strane, ukoliko se nedostajući podatak uoči na određenoj varijabli u datom vremenskom trenutku,

a zatim se u nekom kasnijem vremenskom trenutku pojavi, odnosno ne bude više nedostajući podatak, tada za takav obrazac kažemo da je nemonotoni (Xian, 2016).

Kada je riječ o mehanizmima nedostajućih podataka, prvi koji je ukazao na mehanizme nedostajućih podataka bio je Rubin, koji je definisao tri osnovna mehanizma nedostajanja podataka (Rubin, Little, 2002):

1. potpuno slučajno nedostajući podaci (engl. missing completely at random – MCAR),



## INTRODUCTION

Different data are collected in different areas of research in order to draw certain conclusions based on the analysis of the data collected in the sample. The common denominator of all research, regardless of the scientific field, is the missing data. Missing data are most often defined as values that are not recorded for a particular observed variable. As such, they greatly complicate the processing and analysis of the collected data, and thus consequently influence the conclusions made on the basis of the sample. Taking into account the above, the subject of this paper is the problem of lack of data in the research. The aim of this paper is to present the practical application of the multiple imputation method, as one of the modern methods for solving the problem of missing data, in the SPSS program.

## 1. LITERATURE REVIEW

### 1.1. The concept, patterns and mechanisms of missing data

Missing data is defined as the value of data that is not stored for a given observed variable. As such, they are common in almost all areas of research, especially in the social sciences (Kang, 2013). According to Graham et al. (Graham, Cumsile, & Elek-Fisk, 2003), missing data appear for two reasons.

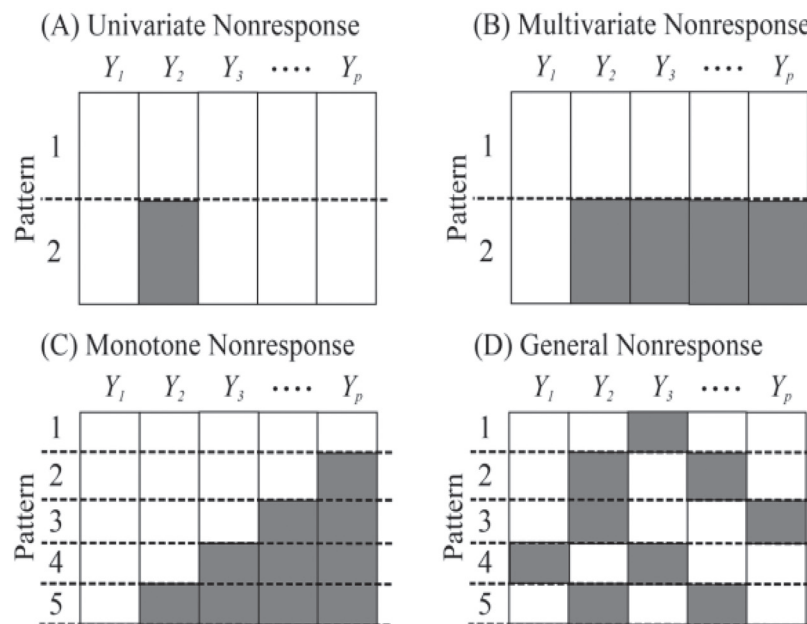
One reason is that the respondents who participate in a certain research do not answer some of the questions for an indefinite reason. Another reason is the lack of missing complete data sets due to sample scattering in longitudinal studies.

The problem of missing data depends on the type of data itself. If the data is of a nominal category, it is more difficult to predict, replace or substitute the missing data. In addition to the form of distribution and the type of missing data, an important factor is the size of the sample in the research, and thus the amount of missing data, the number and type of other collected data, etc. (Oblaković, Sokolovska, & Dinić, 2015). When it comes to the amount of missing data, there is no established limit in the literature regarding the acceptable percentage of missing data in a sample that would not affect the statistical conclusions derived from that sample. Accordingly, Shcafer (1999) found that the percentage of missing data in a sample of 5% or less does not affect the conclusions drawn from such a sample. On the other hand, Bennett (2001) points out that statistical analysis is most likely biased if more than 10% of data are missing from a sample. Tabachnick and Fidell (2012) found that the mechanisms and patterns of missing data have a greater impact on research results than the share of missing data in a sample.

Missing data forms can be divided into:

- single and multivariate forms,
- monotonous and non-monotonous patterns,
- general pattern.

Picture 1 Patterns of missing data



Source: Howard, 2013.

One-variant missing data patterns indicate a situation in which missing data appear on only one variable, as presented with panel A in Figure 1. If the missing data appear on more than one variable, then we are talking about a multivariate pattern of missing data, which can be seen in panel B. If the data for a certain variable is missing not only at a certain time point, but also in all subsequent time conditions, the missing data pattern for a given variable is said to be monotonous, as seen in panel C. On the other hand, if the missing data is observed on a certain variable at a given time and then at a later time it appears, or is no longer missing data, then we say that such a pattern is non-monotonic (Xian, 2016).

When it comes to missing data mechanisms, the first to point out missing data mechanisms was Rubin, who defined three basic mechanisms of missing data (Rubin & Little, 2002):

1. missing completely at random (MCAR),
2. missing at random (MAR) and
3. not missing at random data (NMAR).

The Accidentally Missing Data Mechanism (MCAR) implies that the probability of missing data on an observed variable is not related to other variables or to the values of a given variable Y

2. slučajno nedostajući podaci (engl. missing at random – MAR) i
3. podaci koji ne nedostaju slučajno (engl. not missing at random – NMAR).

Mehanizam potpuno slučajno nedostajućih podataka (MCAR) podrazumijeva da vjerovatnoća nedostatka podataka na posmatranoj varijabli nije povezana s drugim varijablama niti sa vrijednostima date varijable Y (Enders, 2010).

Podaci koji nedostaju po MCAR mehanizmu ne prate nikakav obrazac na osnovu koga bi se mogla predvidjeti vrijednost koja nedostaje, odnosno, kako navodi Kang (2013), podaci koji nedostaju po MCAR mehanizmu nisu povezani ni sa specifičnom vrijednošću koja bi trebalo da se dobije ni sa podacima iz skupa posmatranih varijabli. U nastavku je dat primjer mehanizma potpuno slučajno nedostajućih podataka (MCAR).

**Tabela 1. MCAR mehanizam**

A	B	C	D
-	1	0	1
1	0	-	1
0	-	1	0
1	0	-	1
0	0	1	-

Izvor: prilagođeno prema Warnes, 2021.

Kažemo da podaci nedostaju po NMAR mehanizmu, odnosno da podaci ne nedostaju slučajno, ukoliko distribucija nedostajućih podataka zavisi od samih nedostajućih podataka (Schafer, Graham, 2002). Za razliku od MAR mehanizma, kod NMAR mehanizma postojeći

podaci u skupu podataka ne pružaju dovoljno informacija da se na osnovu njih izvrši adekvatna aproksimacija podataka koji nedostaju (Lang, Little, 2018). U nastavku je dat primjer NMAR mehanizma.

**Tabela 2. NMAR mehanizam**

A	B	C	D
1	1	0	1
1	0	0	1
0	1	-	0
1	0	0	1
0	0	-	1

Izvor: prilagođeno prema Warnes, 2021.

Za razliku od MCAR mehanizma, nedostajanje podataka po MAR mehanizmu podrazumijeva da nedostajući podaci nisu pod uticajem neke varijable u kojoj ima nedostajućih podataka, ali jesu pod uticajem neke druge varijable u skupu podataka (Oblaković, Sokolovska, Dinić, 2015). Dakle, MAR mehanizam ne pretpostavlja da se na osnovu drugih varijabli u posmatranom skupu podataka ne mogu predvidjeti podaci koji nedostaju.

Naime, kako navodi Oblaković i dr. (2015), nedostajući podaci u slučaju MAR mehanizma mogu se objasniti na osnovu raspoloživih podataka, jer su varijable koje su povezane sa uzorkom izmjerene i mogu se uključiti u model u cilju dobijanja nepristrasnih procjena parametara. U nastavku je dat primjer MAR mehanizma.

**Tabela 3. MAR mehanizam**

A	B	C	D
1	1	0	-
1	0	0	-
0	1	1	-
1	0	0	1
0	0	1	1

Izvor: prilagođeno prema Warnes, 2021.

Na osnovu distribucije postojećih podataka na varijablama A, B i C može se predvidjeti vrijednost nedostajućih podataka na varijabli D. Uzimajući u obzir navedeno, vrijednosti nedostajućih podataka na varijabli D mogle bi biti 0, 1, 0.

**1.2. Tretmani nedostajućih podataka**

Postoje različiti tretmani nedostajućih podataka, koji se u osnovi mogu svrstati u dvije grupe:

- tradicionalni tretmani i
- moderni tretmani.

Tradicionalni tretmani obuhvataju metode kao što su isključivanje nedostajućih podataka i jednostruke imputacije, a moderni tretmani obuhvataju metode kao što su metode zasnovane na maksimalnoj vjerodostojnosti, metode višestruke imputacije i dr. (Oblaković, Sokolovska, Dinić, 2015).

**1.2.1. Tretmani temeljeni na brisanju nedostajućih podataka**

Tretmani temeljeni na brisanju nedostajućih podataka javljaju se u dvije varijante (Kang, 2013):

- brisanje, odnosno isključivanje nedostajućih podataka u cjelini (engl. listwise deletion), tzv. pametno brisanje sa liste, i

(Enders, 2010). Missing data according to the MCAR mechanism do not follow any pattern on the basis of which the missing value could be predicted, i.e. according to Kang (2013), the missing data according to the MCAR mechanism are not related to the specific

value to be obtained, nor to the data from set of observed variables. The following is an example of a missing completely at random data (MCAR).

**Table 1 MCAR Mechanism**

A	B	C	D
-	1	0	1
1	0	-	1
0	-	1	0
1	0	-	1
0	0	1	-

Source: adjusted according to Warnes, 2021.

We say that data is missing by the NMAR mechanism if the distribution of missing data depends on the missing data themselves (Schafer & Graham, 2002). Unlike the MAR mechanism, the NMAR

mechanism does not provide enough data in the data set to adequately approximate the missing data (Lang & Little, 2018). An example of the NMAR mechanism is given below.

**Table 2 NMAR mechanism**

A	B	C	D
1	1	0	1
1	0	0	1
0	1	-	0
1	0	0	1
0	0	-	1

Source: adjusted according to Warnes, 2021.

Unlike the MCAR mechanism, the lack of data according to the MAR mechanism implies that missing data are not influenced by a variable in which there is missing data, but are influenced by some other variable in the data set (Oblaković, Sokolovska, & Dinić, 2015). Thus, the MAR mechanism does not assume that the missing data cannot be predicted on the basis of other variables in the observed data set.

Namely, as stated by Oblaković et al. (2015) missing data in the case of the MAR mechanism can be explained on the basis of available data, as the variables associated with the sample have been modified and can be included in the model in order to obtain unbiased parameter estimates. An example of the MAR mechanism is given below.

**Table 3 MAR mechanism**

A	B	C	D
1	1	0	-
1	0	0	-
0	1	1	-
1	0	0	1
0	0	1	1

Source: adjusted according to Warnes, 2021.

Based on the distribution of existing data on variables A, B and C, the value of missing subactans on variable D can be predicted. Taking this into account, the value of the missing data on variable D could be 0,1,0.

**1.2. Missing data treatments**

There are different treatments for missing data, which can basically be divided into two groups:

- traditional treatments and
- modern treatments.

Traditional treatments include methods such as exclusion of missing data and single imputation, and modern treatments include methods

such as methods based on maximum credibility, multiple imputation methods, etc. (Oblaković, Sokolovska, & Dinić, 2015).

**1.2.1. Treatments based on deleting missing data**

Treatments based on deleting missing data occur in two variants (Kang, 2013):

- deletion, i.e. exclusion of missing data in its entirety (listwise deletion), the so-called smart delete from list and
- deletion, i.e. exclusion of missing data by pairs (pairwise deletion).

Listwise deletion means deleting observations on which at least one variable has missing data. This means that further analysis

- brisanje, odnosno isključivanje nedostajućih podataka po parovima (engl. pairwise deletion).

Isključivanje nedostajućih podataka u cjelini (engl. listwise deletion) podrazumijeva brisanje opažanja na kojima barem jedna varijabla ima nedostajući podatak. To znači da se dalja analiza vrši na osnovu

onih opažanja koja nemaju nijedan nedostajući podatak. Sa druge strane, isključivanje nedostajućih podataka po parovima podrazumijeva isključivanje iz analize samo onih vrijednosti varijabli koje nedostaju za pojedina opažanja, uz zadržavanje ostalih vrijednosti na datoj varijabli za dato opažanje (Ilić, 2012).

**Tabela 4.** Isključivanje u cjelini i u parovima

Pol	Br. zaposlenih	Prodaja	Pol	Br. zaposlenih	Prodaja
M	25	343	M	25	343
<del>Ž</del>		<del>280</del>	Ž	---	280
M	33	332	M	33	332
<del>M</del>		<del>272</del>	M	---	272
Ž	25		Ž	25	---
M	29	326	M	29	326
	<del>26</del>	<del>259</del>	---	26	259
M	32	297	M	32	297

Izvor: prilagođeno prema Sunil, 2016.

Primjena metode brisanja nedostajućih podataka u cjelini (engl. listwise deletion) opravdana je u slučaju da se utvrdi da nedostajući podaci nedostaju po MCAR mehanizmu (Kang, 2013). Međutim, ukoliko nedostajući podaci ne nedostaju po MCAR mehanizmu, tada primjena metode brisanja u cjelini može uzrokovati pristrasnost u procjeni parametara (Donner, 1982). Kang (2013) navodi da brisanje u paru izaziva manji nivo pristrasnosti ukoliko podaci nedostaju po MCAR ili MAR mehanizmu, međutim, ako nedostaje veliki procenat podataka, analiza će biti manjkava. Graham i saradnici (Graham i dr., 2003) navode da su oba načina eliminacije nedostajućih podataka bazirana na brisanju generalno neprihvatljiva. U prilog tome idu rezultati koji pokazuju da se isključivanjem gubi na snazi testa. Ovo iz razloga što se smanjuje veličina uzorka čak i pod pretpostavkom da podaci nedostaju po MCAR mehanizmu, s obzirom na to da su t-testovi funkcije veličine uzorka (Ilić, 2012). Iako tretmani temeljeni na brisanju nedostajućih podataka imaju očigledne manjkavosti, u okviru statističkih paketa često su automatski odabrana opcija (Oblaković, Sokolovska, Dinić, 2015).

### 1.2.2. Tretmani temeljeni na imputaciji

Imputacija je proces zamjene podataka koji nedostaju procijenjenim vrijednostima. Umjesto brisanja nedostajućih podataka, ovaj pristup čuva sve slučajeve zamjenom podataka koji nedostaju vjerovatnom vrijednošću procijenjenom drugim dostupnim informacijama. Nakon što su ovim pristupom zamijenjene sve vrijednosti koje nedostaju, skup podataka analizira se korištenjem standardnih tehnika za potpune podatke (Kang, 2013).

Tretmani nedostajućih podataka temeljeni na imputaciji mogu se podijeliti u dvije grupe:

- tretmani nedostajućih podataka bazirani na jednostrukoj imputaciji i
- tretmani nedostajućih podataka bazirani na višestrukoj imputaciji.

Jedna od metoda jednostruke imputacije jeste metoda zamjene nedostajućih podataka srednjom vrijednošću. Zamjena srednjom vrijednošću jeste postupak pri kojem se vrši zamjena svih nedostajućih podataka date varijable srednjom vrijednošću te varijable (Ilić, 2012). Zamjena se vrši srednjom vrijednošću ukoliko su varijable numeričke, međutim, ukoliko su varijable kategorijalne, tada se zamjena vrši modalnom vrijednošću, dok se u slučaju ordinalnih varijabli nedostajući podaci zamjenjuju medijanom (Oblaković, Sokolovska, Dinić, 2015). Primjenom tretmana zamjene nedostajućih podataka

dolazi do suženja varijanse varijabli s nedostajućim podacima, što može rezultirati uticajem na visinu korelacija s ostalim varijablama. Kako bi se izbjegao problem suženja varijanse, nedostajući podatak može se zamijeniti srednjom vrijednošću koja je izračunata za poduzorak, a ne na cijelom uzorku za datu varijablu (Tabachnick, Fidell, 2001). Poduzorak mogu biti dva ili tri podatka koji prethode nedostajućem podatku i koji slijede nakon nedostajućeg podatka. Na ovaj način varijansa varijable koja sadrži nedostajuće podatke i dalje je sužena, ali je to suženje ograničeno na poduzorak.

U okviru jednostruke imputacije svrstava se i metoda imputacije pomoću regresije. Imputacija pomoću regresije podrazumijeva da se nedostajući podaci zamjenjuju predviđenim vrijednostima koje su utvrđene na osnovu regresione jednačine u kojoj se kao nezavisne varijable koriste varijable na kojima su zabilježeni podaci. Ovaj tretman ima niz prednosti, jer se zadržava veličina uzorka u odnosu na brisanje u cjelini ili parovima i izbjegava se značajna promjena standardne devijacije ili oblika distribucije (Kang, 2013).

Pored navedenih prednosti, ovaj tretman nedostajućih podataka ima i svoje nedostatke. Oni se ogledaju u činjenici da su nedostajući podaci zamijenjeni na osnovu postojećih podataka zabilježenih na drugim varijablama, što može rezultirati visokim stepenom korelacije. Pored toga, treba pretpostaviti da postoji linearni odnos između varijabli korištenih u regresionoj jednačini, kada ga možda i nema (Swalin, 2018).

Tretman jednostruke imputacije obuhvata i metod slučajne imputacije. Metoda slučajne imputacije podrazumijeva zamjenu nedostajuće vrijednosti vrijednošću koju je prijavio drugi ispitanik (donator), koji je ili odabran slučajno iz uzorka ili odabran na osnovu sličnosti „primatelja“ u smislu vrijednosti prijavljenih za druge varijable (Newman, 2003). Dakle, slučajna imputacija podrazumijeva imputaciju nedostajućih podataka izmjenom vrijednošću nekog drugog slučaja sa sličnim obrascem odgovora na ostalim izmjerenim varijablama ili vrijednošću date varijable nasumično odabranog slučaja iz uzorka (Oblaković, Sokolovska, Dinić, 2015).

### 1.2.3. Metode zasnovane na modelu

Metod višestruke imputacije, kao i metode maksimalne vjerodostojnosti spadaju u grupu metoda zasnovanih na modelu, čija je osnovna prednost u tome što daju nepristrasne procjene u slučaju MCAR i MAR mehanizama (Oblaković, Sokolovska, Dinić, 2015).

Metoda višestruke imputacije proizvodi višestruke vrijednosti za imputaciju jedne vrijednosti koja nedostaje korišćenjem različitih

is performed on the basis of those observations that do not have any of the missing data. On the other hand, excluding missing data by pairs means excluding from the analysis only those values of

variables that are missing for individual observations, while retaining other values on a given variable for a given observation (Ilić, 2012).

**Table 4** Exclusion as a whole and in pairs

Gender	No. employees	Sales	Gender	No.employees	Sales
M	25	343	M	25	343
<del>Ž</del>	<del>---</del>	<del>280</del>	<del>Ž</del>	<del>---</del>	<del>280</del>
M	33	332	M	33	332
<del>M</del>	<del>---</del>	<del>272</del>	<del>M</del>	<del>---</del>	<del>272</del>
Ž	25	---	Ž	25	---
M	29	326	M	29	326
<del>---</del>	<del>26</del>	<del>259</del>	<del>---</del>	<del>26</del>	<del>259</del>
M	32	297	M	32	297

Source: adjusted according to Sunil, 2016

The application of the listwise deletion method is justified in case it is determined that the missing data are missing according to the MCAR mechanism (Kang, 2013). However, if the missing data are not missing by the MCAR mechanism, then the application of the deletion method as a whole can cause bias in parameter estimation (Donner, 1982). Kang (2013) states that deleting in pairs causes a lower level of bias if data is missing under the MCAR or MAR mechanism; however, if a large percentage of data is missing, the analysis will be deficient. Graham et al (Graham i dr., 2003) state that both ways of eliminating missing data based on deletion are generally unacceptable. This is supported by the results which show that the exclusion loses the effect of the strength test. This is due to the fact that the sample size decreases even on the assumption that data are missing by the MCAR mechanism, since t-tests are a function of sample size (Ilić, 2012). Although treatments based on deleting missing data have obvious shortcomings, within statistical packages, the option is often automatically selected (Oblaković, Sokolovska, & Dinić, 2015).

1.2.2. Treatments based on imputation

Imputation is the process of replacing the missing data with estimated values. Instead of deleting any case that has any missing value, this approach preserves all cases by replacing the missing data with a probable value estimated by other available information. After all missing values have been replaced by this approach, the data set is analyzed using the standard techniques for a complete data (Kang, 2013).

Imputation-based treatments for missing data can be divided into two groups:

- treatments of missing data based on single imputation and
- treatments of missing data based on multiple imputations.

One of the methods of single imputation is the method of replacing missing data with a medium value. Replacement with a medium value is a procedure in which all missing data of a given variable are replaced with the medium value of that variable (Ilić, 2012). Replacement is performed with a medium value if the variables are numerical, however, if the variables are categorical then the replacement is performed with a modal value, while in the case of ordinal variables the missing data are replaced with a median (Oblaković, Sokolovska, & Dinić, 2015). The application of the missing data replacement treatment narrows the variance of variables with missing data, which may result in an impact on the amount of correlations with other variables. To avoid the problem of narrowing the variance, the missing data can be replaced by the medium value

calculated for the subsample rather than on the whole sample for a given variable (Tabachnick & Fidell, 2001). A subsample can be two or three data that precede the missing data and that follow the missing data. In this way, the variance of the variable containing the missing data is still narrowed, but this narrowing is limited to the subsample.

The method of imputation by regression is also included in the framework of single imputation. Imputation by regression implies that the missing data are replaced by predicted values determined on the basis of the regression equation in which the variables on which the data are recorded are used as independent variables. This treatment has a number of advantages because it retains the sample size relative to the deletion as a whole or in pairs and avoids a significant change in the standard deviation or form of distribution (Kang, 2013).

In addition to the above advantages, this treatment of missing data also has its drawbacks. They are reflected in the fact that missing data have been replaced on the basis of existing data recorded on other variables, which may result in a high degree of correlation. In addition, it should be assumed that there is a linear relationship between the variables used in the regression equation, even when that relationship may not exist (Swalin, 2018).

The treatment of single imputation includes the method of random imputation. The random imputation method involves replacing the missing value with the value reported by another respondent (donor), who is either randomly selected from the sample or selected based on the similarity of the "recipient" in terms of values reported for other variables (Newman, 2003). Thus, random imputation implies imputation of missing data by the measured value of another case with a similar response pattern on other measured variables or the value of a given variable of a randomly selected case from a sample (Oblaković, Sokolovska, & Dinić, 2015).

1.2.3. Metode zasnovane na modelu

The multiple imputation method as well as the maximum reliability method belong to the group of model-based methods, whose main advantage is that they give impartial estimates in the case of MCAR and MAR mechanisms (Oblaković, Sokolovska, & Dinić, 2015).

The multiple imputation method produces multiple values to impute a single missing value using different simulation models. This method introduces the variability of imputed data to find a number of convincing answers for missing data. In multiple imputations, each missing data is replaced with m values obtained from m iterations, where m > 1 and m are usually in the range of 3 to 10 (Khan & Hoque, 2020).

simulacijskih modela. Ova metoda uvodi varijabilnost imputiranih podataka kako bi se pronašao niz uvjerljivih odgovora za nedostajuće podatke. U višestrukoj imputaciji, svaki podatak koji nedostaje zamjenjuje se s m vrijednostima dobijenim iz m iteracija, pri čemu je  $m > 1$  i m se obično nalazi u intervalu od 3 do 10 (Khan, Hoque, 2020).

Metoda višestruke imputacije sprovodi se kroz tri koraka. Prvi korak je sama imputacija. Preferirana metoda imputacije je ona koja odgovara obrascu nedostajućih podataka. Naime, u zavisnosti od toga da li se radi o jednovarijantnom ili monotonom obrascu, nedostajući podaci mogu se imputirati pomoću metode regresije ili metode prediktivnog srednjeg podudaranja ako je varijabla na kojoj podaci nedostaju kontinuirana. Ukoliko podaci nedostaju proizvoljno koristi se MCMC (engl. Markov chain Monte Carlo) metoda (Dong, Peng, 2013).

Primjena logističke regresije u okviru metode višestruke imputacije podrazumijeva da se najprije odredi dihotomna varijabla koja sadrži podatke o tome da li na njoj ima ili nema nedostajućih podataka. U ovom prvom koraku stvara se nekoliko slučajno odabranih poduzoraka koji sadrže kompletirane podatke, odnosno koji ne sadrže nedostajuće vrijednosti niti na jednoj varijabli, kako bi se identifikovala distribucija varijable koja sadrži nedostajuće podatke. Rezultat prvog koraka jesu predviđene vrijednosti nedostajućih podataka. U sljedećem koraku ponovo se kreira nekoliko slučajnih poduzoraka, s tom razlikom što sada poduzorak uključuje i varijable sa nedostajućim podacima.

Zatim se sve nedostajuće vrijednosti zamjenjuju procjenama na osnovu rezultata regresije iz prvog koraka. Na osnovu dobijenih setova podataka računaju se pojedinačne procjene, a do konačnih procjena modela dolazi se uprosječavanjem parametara procjene iz kreiranih multiplih setova (Tabachnick, Fidell, 2001).

MCMC metod je za numeričke varijable, dok se za kategorijalne varijable primjenjuju druge metode, kao što je, na primjer, MIC (engl. multiple imputation for categorical data) ili FCS metod (engl. fully conditional specification).

Prednosti ovog tretmana su brojne. Jedna od njih ogleda se u činjenici da se može primijeniti na longitudinalnim podacima. Pored toga, dobijaju se manje greške parametara u odnosu na, na primjer, brisanje, bilo u paru ili u cjelini (Oblaković, Sokolovska, Dinić, 2015).

Kao što je već navedeno, metode maksimalne vjerodostojnosti spadaju u metode zasnovane na modelima i podrazumijevaju iterativni postupak. To znači da se u cilju eliminacije nedostajućih podataka koriste svi raspoloživi podaci u uzorku, i kompletirani i nedostajući, kako bi se utvrdile vrijednosti koje imaju najveću vjerovatnoću pojavljivanja u posmatranim podacima (Alison, 2002). Jedna od metoda maksimalne vjerodostojnosti je EM algoritam.

EM algoritam (engl. expectation maximization algorithm) predstavlja dvostepeni iterativni postupak, koji se sastoji od dva koraka:

- E koraka i
- M koraka.

Prvi korak, korak E, dobio je ime od prvog slova engleske riječi expectation, što u prevodu znači očekivanje, dok je drugi korak, korak M, dobio ime od prvog slova engleske riječi maximization, što u prevodu znači maksimizacija (Vasić, 2018).

Prvim korakom, E korakom, procjenjuju se parametri distribucije na osnovu raspoloživih podataka, dok se u drugom koraku, M koraku, računaju parametri za nedostajuće podatke maksimiziranjem vjerovatnoće dobijanja očekivanih vrijednosti iz E koraka. Ova dva koraka

ponavljaju se u nizu iteracija sve dok se ne postigne konvergencija, odnosno dok se procjene parametara ne počnu razlikovati iz iteracije u iteraciju (Oblaković, Sokolovska, Dinić, 2015).

Kod primjene EM algoritma, u koraku E se za svaki jedinstveni obrazac nedostajućih podataka kreira model višestruke linearne regresije za svaku promjenljivu koja ima nedostajuće podatke. U datom modelu, zavisna ili objašnjena promjenljiva predstavlja promjenljivu sa nedostajućim podacima, a nezavisne ili objašnjavajuće promjenljive su one koje su u datom jedinstvenom obrascu kompletno raspoložive. Na taj način se nedostajući podaci ocjenjuju pomoću linearne povezanosti sa kompletno raspoloživim promjenljivim. Kod datih modela višestruke linearne regresije, nepoznati parametri se ocjenjuju pomoću elemenata vektora sredina promjenljivih, kao i kovarijacione matrice promjenljivih (Vasić, 2018).

Tabachnick i Fidell (2001) ističu da je prednost EM algoritma, kao metode maksimalne vjerodostojnosti, u tome što je jednostavan i što postoji manja opasnost od previsoke saglasnosti između podataka i modela, odnosno situacije u kojoj testirani model izgleda bolje nego što zaista jeste. Dong i Peng (2013) ističu kao nedostake EM algoritma to što je primjena ograničena na linearne modele i podatke koji su normlano distribuirani. Drugi nedostatak koji navedeni autori navode vezan je za softvere za analizu nedostajućih podataka. Naime, softveri uglavnom ne obezbjeđuju procjenu standardnih grešaka parametara, zbog čega se EM ne preporučuje kada je primarni cilj statističko testiranje intervala povjerenja procijenjenih parametara.

FIML metod (engl. full information maximum likelihood) jeste metod koji se obično predstavlja kao kovarijansna matrica promjenljive i vektora očekivanja. Prednost u odnosu na EM algoritam je u tome što omogućava direktno izračunavanje odgovarajućih standardnih grešaka i testiranje statistike. Postupak zahtijeva da podaci budu bar tipa MAR ili MCAR (Ilić, 2012).

## 2. METODOLOGIJA I REZULTATI

U ovom poglavlju biće dat primjer kako primijeniti metodu višestruke imputacije u SPSS (Statistical Package for Social Sciences) programu, kao jednom od, danas, najčešće korišćenih programa za obradu podataka.

U primjeru se analiziraju 23 finansijska pokazatelja za 226 preduzeća iz oblasti trgovine na veliko i malo, koja su registrovana na teritoriji Republike Srpske, a koja su, prema podacima APIF-a, u periodu od 2017. do 2020. godine imala blokiran račun. Svrha analize je kreiranje modela za predviđanje platežne nesposobnosti preduzeća iz navedene oblasti.

S obzirom na to da se radi o finansijskim pokazateljima, kao varijablama koje se analiziraju, isti su identifikovani kao varijable numeričkog tipa (Scale). Pravilno označavanje tipa varijabli, prije same analize podataka, vrlo je značajno kako se ne bi desilo da se dobiju neočekivane vrijednosti, na primjer, pol u decimalnom zapisu i slično.

Prvi korak u provođenju višestruke imputacije u SPSS programu jeste analiza mehanizma po kojem podaci nedostaju. Identifikovanje mehanizma nedostajućih podataka vrši se tako što se sa padajućeg menija izabere opcija Analyze, a zatim se iz navedene opcije bira Multiple Imputation / Analyze Patterns..., nakon čega se otvara prozor za dijalog u okviru kojeg je potrebno u polje Analyze Across Variables iz polja Variables prebaciti varijable na kojima želimo izvršiti eliminaciju nedostajućih podataka. U okviru prozora Output potrebno je čekirati sve tri ponuđene opcije.

The multiple imputation method is implemented in three steps. The first step is imputation itself. The preferred method of imputation is that which corresponds to the pattern of missing data. Namely, depending on whether it is a single-variant or monotonic pattern, missing data can be imputed using the regression method or the predictive medium matching method if the variable on which the data are missing is continuous. If data are missing, the MCMC (Markov chain Monte Carlo) method is used arbitrarily (Dong & Peng, 2013).

The application of logistic regression within the multiple imputation method implies that the dichotomous variable is first determined, which contains data on whether or not there is missing data on it. In this first step, several randomly selected subsamples are created that contain complete data, ie that do not contain missing values on any of the variables, in order to identify the distribution of the variable that contains the missing data. The result of the first step is the predicted values of the missing data. In the next step, several random subsamples are re-created, with the difference that the subsample now includes variables with missing data.

Then, all missing values are replaced by estimates based on the regression results from the first step. Based on the obtained data sets, individual estimates are calculated, and the final estimates of the model are obtained by averaging the estimation parameters from the created multiple sets (Tabachnick & Fidell, 2001).

The MCMC method is for numerical variables, while other methods are used for categorical variables, such as MIC (multiple imputation for categorical data) or FCS method (fully conditional specification).

The benefits of this treatment are numerous. One of them is reflected in the fact that it can be applied to longitudinal data. In addition, there are fewer parameter errors compared to, for example, deletion either in pairs or as a whole (Oblaković, Sokolovska, & Dinić, 2015).

As already mentioned, maximum plausibility methods belong to model-based methods and imply an iterative procedure. This means that in order to eliminate the missing data, all available data in the sample are used, both completed and missing, in order to determine the values that have the highest probability of appearing in the observed data (Alison, 2002). One of the methods of maximum credibility is the EM algorithm.

EM expectation maximization algorithm is a two-step iterative procedure, which consists of two steps:

- E step and
- M step.

The first step, step E, got its name from the first letter of the English word expectation, which means expectation, while the second step, step M, got its name from the first letter of the English word maximization, which means maximization (Vasić, 2018).

The first step, E step, estimates the distribution parameters based on the available data, while the second step, M step, calculates the missing data parameters by maximizing the probability of obtaining the expected values from E step. These two steps are repeated in a series of iterations until convergence is achieved, i.e. until the parameter estimates begin to differ from iteration to iteration (Oblaković, Sokolovska, & Dinić, 2015).

When applying the EM algorithm, in step E, a multiple linear regression model is created for each unique missing data pattern for each variable that has missing data.

In a given model, a dependent or explained variable is a variable with missing data, and independent or explanatory variables are

those that are completely available in a given unique pattern. In this way, missing data is evaluated using a linear relationship with completely available variables. In the given models of multiple linear regression, unknown parameters are estimated using the elements of the vector of the medium variables, as well as the covariance matrix of the variables (Vasić, 2018).

Tabachnick i Fidell (2001) point out that the advantage of the EM algorithm, as a method of maximum reliability, is that it is simple and there is less danger of too much agreement between data and models, i.e. a situation where the tested model looks better than it really is. Dong i Peng (2013) point out as shortcomings of the EM algorithm that the application is limited to linear models and data that are normally distributed. Another shortcoming cited by these authors is related to software for analyzing missing data.

Namely, software generally does not provide an estimate of standard parameter errors, which is why EM is not recommended when the primary goal is statistical testing of the confidence interval of the estimated parameters. The FIML (full information maximum likelihood) method is a method that is usually presented as a covariance matrix of a variable and an expectation vector. The advantage over the EM algorithm is that it allows direct calculation of appropriate standard errors and testing of statistics. The procedure requires that the data be at least of the MAR or MCAR type (Ilić, 2012).

## 2. METHODOLOGY AND RESULTS

This chapter will give an example of how to apply the method of multiple imputation in the SPSS (Statistical Package for Social Sciences) program, as one of the most commonly used data processing programs today.

The example analyzes 23 financial indicators for 226 companies in the field of wholesale and retail trade, which are registered in the territory of Republika Srpska, and which, according to APIF data, had a blocked account in the period from 2017-2020. The purpose of the analysis is to create a model for predicting the insolvency of companies in this area. Since these are financial indicators, as variables that are analyzed, they are identified as variables of numerical type (Scale). Proper labeling of the type of variables, before the analysis of the data itself, is very important so that it does not happen that unexpected values are obtained, for example, gender in decimal notation and the like.

The first step in conducting multiple imputations in the SPSS program is to analyze the mechanism by which data is lacking. Identifying the mechanism of missing data is done by selecting the Analyze option from the drop-down menu, then selecting Multiple Imputation / Analyze Patterns ... from the specified option, after which a dialog window opens in which you need to transfer variables from the Variables field (on which we want to eliminate the missing data) in the Analyze Across Variables field. Within the Output window, you need to check all three offered options.

The minimum percentage of missing data for the variables we want to display is determined in the field Minimum percentage missing for variable to be displayed, within which 10 is automatically offered.

In this example, this percentage was reduced to 0.1 to include a larger number of variables with missing data.

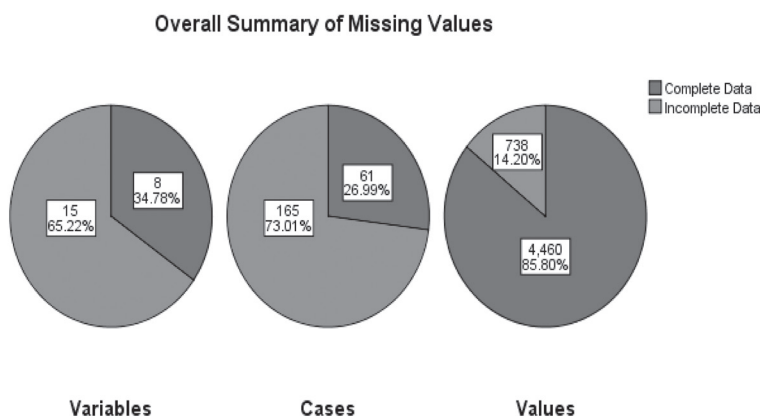
Pressing OK gives the results of the analysis, which consists of 4 parts. The first part of the analysis, Overall Summary of Missing Values - refers to the frequency and percentage of variables, cases and cells in the matrix that contain missing data. Based on Figure

Minimalni procenat nedostajućih podataka za varijable koje želimo prikazati određuje se u polju Minimum percentage missing for variable to be displayed, u okviru kojeg je automatski ponuđeno 10.

U ovom primjeru je ovaj procenat smanjen na 0,1 kako bi se obuhvatio veći broj varijabli sa nedostajućim podacima. Pritiskom na OK dobijaju se rezultati analize koji se sastoje od četiri dijela.

Prvi dio analize, Overall Summary of Missing Values, odnosi se na frekvencu i procenat varijabli, slučajeva i ćelija u matrici koji sadrže nedostajuće podatke. Na osnovu slike 2. vidi se da 15 od 23 varijable, odnosno 65,22% unesenih varijabli sadrži nedostajuće podatke. Nedostajući podaci javljaju se kod 165 od 226 posmatranih preduzeća u uzorku, što čini 73,01%. Treći grafički prikaz sa slike broj 3. govori da 738 ćelija u matrici sadrži nedostajuće podatke, a da 4.460 ćelija ima kompletirane podatke.

Slika 2. Nedostajući podaci – varijable, slučajevi, ćelije



Izvor: izrada autora u SPSS programu

U tabeli 5. dat je drugi dio analize, koji se odnosi na pregled frekvenci i procenata nedostajućih podataka po varijablama, po opadajućem redoslijedu. Na osnovu tabele može se vidjeti da najveći procenat nedostajućih podataka imaju varijable ROE, RZ i KP, odnosno prinos

na kapital, racio zaduženosti (46%) i kvalitet prihoda (39,8%). Kako su prediktorske varijable korišćene u ovom radu numeričke, u tabeli je dat i pregled aritmetičke sredine i standardne devijacije.

Tabela 5. Pregled nedostajućih podataka po varijablama

	Missing		Valid N	Mean	Std. Deviation
	N	Percent			
ROE	104	46.0%	122	-.04374	4.387070
RZ	104	46.0%	122	15.83432	57.961009
KP	90	39.8%	136	1.94204	3.636423
RPK	72	31.9%	154	-88.75668	898.142236
KOZ	53	23.5%	173	9.28087	29.162227
BPM	52	23.0%	174	-10.05555	67.014697
NPM	52	23.0%	174	-10.09716	67.045458
NP_II	45	19.9%	181	4.35534	11.477801
NP_I	45	19.9%	181	2.74051	10.006440
NOKUS	45	19.9%	181	-7.98816	79.315459
ROP	29	12.8%	197	17.43561	70.495075
logGGE	19	8.4%	207	7.43478	3.004106
KFS	16	7.1%	210	-7324.09819	54922.277027
ROOD	9	4.0%	217	2.75444	5.693066
KOOI	3	1.3%	223	1.13151	1.995308

a. Maximum number of variables shown: 25  
 b. Minimum percentage of missing values for variable to be included: 0.1%

Izvor: izrada autora u SPSS programu

Treći dio analize odnosi se na obrazac nedostajućih podataka, koji je predstavljen slikom 3. Na osnovu grafikona, koji je dat slikom 3, može se zaključiti da preovladava monotoni obrazac nedostajućih podataka i da podaci ne nedostaju po slučajnom rasporedu. Drugim riječima, nije priustan MCAR (engl. Missing completely at random) mehanizam nedostajućih podataka.

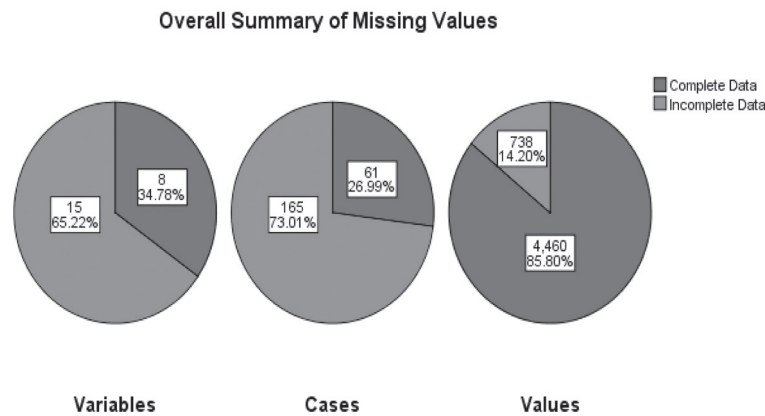
Prikaz koji je dat slikom 3. služi vizuelnoj inspekciji mehanizma po kojem podaci nedostaju. Prvi red predstavlja, u našem primjeru, grupu slučajeva na kojima nema nedostajućih podataka. Drugi obrazac, koji se nalazi u drugom redu, obuhvata slučajeve, odnosno preduzeća kojima nedostaje samo racio obrata obaveza prema dobavljačima i tako svaki sljedeći red predstavlja novi obrazac u



2, it can be seen that 15 of the 23 variables, i.e. 65.22% of the entered variables contain missing data. Missing data appear in 165 of the 226 observed companies in the sample, which is 73.01%.

The third graph from Figure 3 shows that 738 cells in the matrix contain missing data, and that 4460 cells have completed data.

**Figure 2** Missing data - variables, cases, cells



Source: author's work in the SPSS program

Table 5 gives the second part of the analysis, which refers to the review of frequencies and estimates of missing data by variables, in descending order. Based on the table, it can be seen that the largest percentage of missing data have the variables ROE, RZ

and KP, i.e. return on capital, debt ratio (46%) and income quality (39.8%). As the predictor variables used in this paper are numerical, the table also provides an overview of the arithmetic medium and standard deviation

**Table 5** Overview of missing data by variables

	Missing		Valid N	Mean	Std. Deviation
	N	Percent			
ROE	104	46.0%	122	-.04374	4.387070
RZ	104	46.0%	122	15.83432	57.961009
KP	90	39.8%	136	1.94204	3.636423
RPK	72	31.9%	154	-88.75668	898.142236
KOZ	53	23.5%	173	9.28087	29.162227
BPM	52	23.0%	174	-10.05555	67.014697
NPM	52	23.0%	174	-10.09716	67.045458
NP_II	45	19.9%	181	4.35534	11.477801
NP_I	45	19.9%	181	2.74051	10.006440
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ROP	29	12.8%	197	17.43561	70.495075
logGGE	19	8.4%	207	7.43478	3.004106
KFS	16	7.1%	210	-7324.09819	54922.277027
ROOD	9	4.0%	217	2.75444	5.693066
KOOI	3	1.3%	223	1.13151	1.995308

a. Maximum number of variables shown: 25  
 b. Minimum percentage of missing values for variable to be included: 0.1%

Source: author's work in the SPSS program

The third part of the analysis refers to the missing data pattern, which is presented in Figure 3. Based on the graph given in Figure 3, it can be concluded that a monotonous pattern of missing data prevails and that data is not missing at random. In other words, the Missing Completely At Random (MCAR) mechanism is missing.

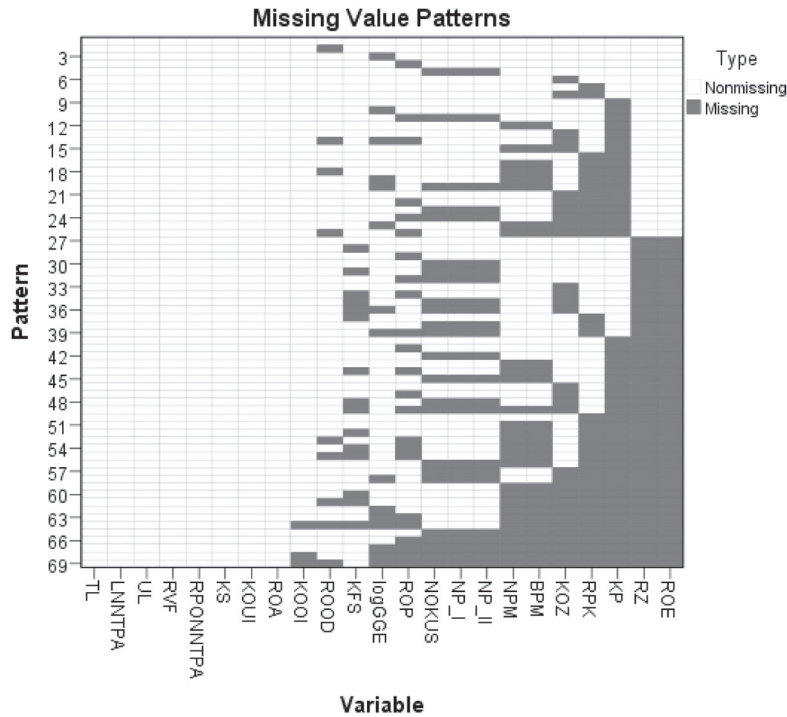
The representation given in Figure 3 serves to visually inspect the mechanism by which the data is missing. The first row represents, in our example, a group of cases where there is no missing data. The second pattern, which is in the second row, includes cases,

i.e. companies that lack only the ratio of turnover of liabilities to suppliers, and so each subsequent line represents a new pattern in which an increasing number of cases and variables are missing. The last, 69th line, i.e. the pattern is the pattern that includes companies that, as can be seen, lack the largest amount of data or financial ratio indicators. So, the rows of this graph have numbered patterns of missing data, and the columns have variables. The variables are sorted by the percentage of missing data, so the variable TL (current liquidity) has no missing data, while the largest percentage of missing data has the variable ROE (return on equity).

kojem nedostaje sve veći broj slučajeva i varijabli. Posljednji, 69. red, odnosno obrazac, jeste obrazac koji obuhvata preduzeća kojima, kao što se vidi, nedostaje najveći broj podataka odnosno finansijskih racio pokazatelja. Dakle, u redovima ovog grafikona su numerisani obrasci nedostajućih podataka, a u kolonama varijable.

Varijable su poredane prema procentu nedostajućih podataka, pa tako varijabla TL (tekuća likvidnost) nema nedostajućih podataka, dok najveći procenat nedostajućih podataka ima varijabla ROE (prinos na kapital).

Slika 3. Obrazac nedostajućih podataka



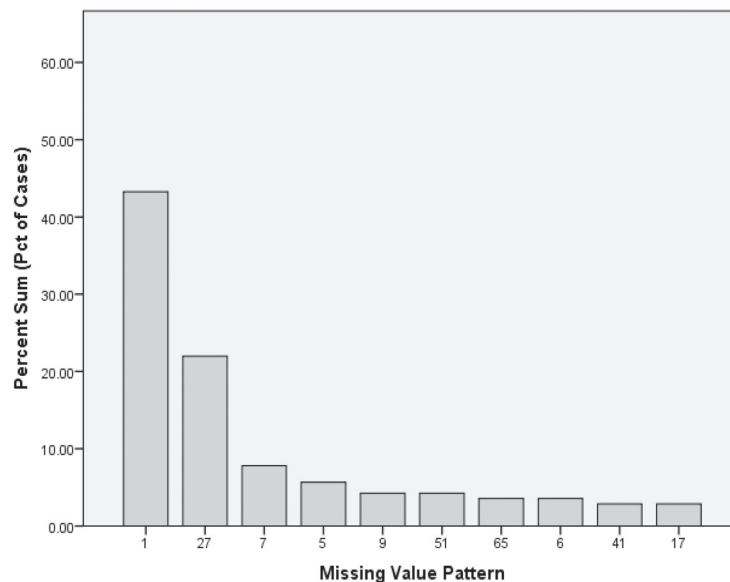
Izvor: izrada autora u SPSS programu

Kada je riječ o mehanizmu nedostajućih podataka, ukoliko se uoči neka pravilnost ili koncentracija u osjenčenim poljima, tada se može konstatovati da postoji određeni obrazac po kojem podaci nedostaju. U takvoj situaciji podaci ne nedostaju slučajno, tj. nije riječ o MCAR mehanizmu. Ukoliko se na grafikonu uoči porast ili smanjenje osjenčenih površina, to ukazuje da nedostajući podaci nedostaju po monotnom obrascu. Monotonicitet je samo jedan od NMAR mehanizama nedostajućih podataka (Oblaković, Sokolovska, Dinić, 2015).

U našem primjeru se na osnovu grafikona, koji je dat slikom broj 3, može vidjeti da postoji koncentracija osjenčenih polja u donjem desnom uglu, što nas navodi na zaključak da je u podacima najvjerovatnije prisutan monotonicitet.

Na osnovu četvrtog dijela analize može se vidjeti koji se obrazac nedostajućih podataka najčešće ponavlja.

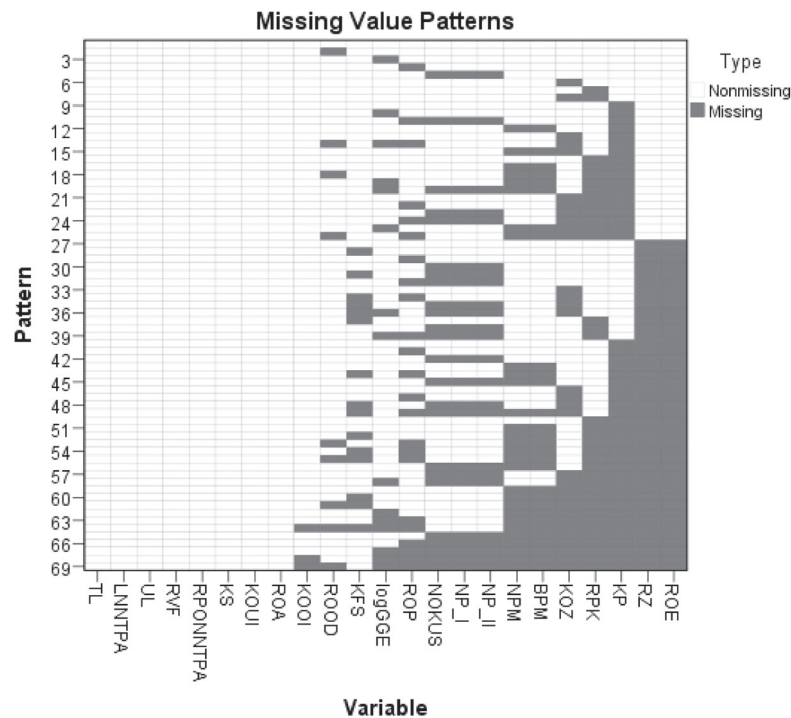
Slika 4. Procenat slučajeva s određenim obrascem nedostajanja podataka



The 10 most frequently occurring patterns are shown in the chart.

Izvor: izrada autora u SPSS programu

Figure 3 Missing data pattern



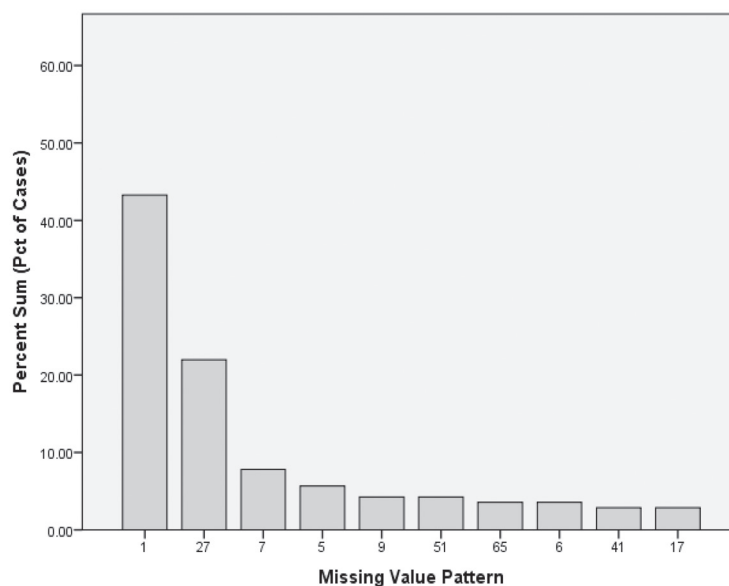
Source: author's work in the SPSS program

When it comes to the mechanism of missing data, if some regularity or concentration is observed in the shaded fields, then it can be stated that there is a certain pattern according to which the data is missing. In such a situation, the data are not missing by accident, i.e. it is not an MCAR mechanism. If the chart shows an increase or decrease in shaded areas, it indicates that the missing data are missing according to the monotonic pattern. Monotonicity is only one of the NMAR mechanisms of missing data (Oblaković, Sokolovska, & Dinić, 2015).

In our example, based on the graph given in Figure 3, it can be seen that there is a concentration of shaded fields in the lower right corner, which leads us to the conclusion that monotonicity is most likely present in the data.

Based on the fourth part of the analysis, it can be seen which pattern of missing data is most often repeated.

Figure 4 Percentage of cases with a certain pattern of lack of data



The 10 most frequently occurring patterns are shown in the chart.

Source: author's work in the SPSS program

The graph, given in Figure 4, shows that the most common is the first pattern, the pattern according to which data is missing. However, if we go back to the chart from Figure 3, we see that there is actually no missing data according to this pattern. The next pattern according to which data are most often missing is form 27.

After analyzing the missing data, we can approach their replacement by applying multiple imputations. The application of multiple imputation in the SPSS program means that the Multiple Imputation / Impute Missing Data Values option is selected from the Analyze drop-down menu ... After that, a dialog window opens in which it

Grafikon koji je dat slikom 4. prikazuje da je načešći prvi obrazac, obrazac po kojem nedostaju podaci. Međutim, ukoliko se vratimo na grafikon sa slike 3, vidimo da zapravo po tom obrascu nema nedostajućih podataka. Sljedeći obrazac po kojem podaci najčešće nedostaju jeste obrazac 27.

Nakon analize nedostajućih podataka, možemo pristupiti njihovoj zamjeni primjenom višestruke imputacije. Primjena višestruke imputacije u SPSS programu podrazumijeva da se iz padajućeg menija Analyze odabere opcija Multiple Imputation / Impute Missing Data Values... Nakon toga otvara se prozor za dijalog u okviru kojeg je potrebno da se iz polja Variables prebace varijable nad kojima želimo da izvršimo višestruku imputaciju u polje Variables in Model. Broj imputacija može se mijenjati u polju Imputations, ali smo u primjeru zadržali pet imputacija, koliko se inače u literaturi preporučuje. Matrica sa zamijenjenim nedostajućim podacima može se sačuvati kao nova matrica ili u okviru postojeće matrice. U ovom primjeru matrica sa zamijenjenim nedostajućim podacima sačuvana je kao nova sa imenom impute.matrica.

Na kartici Method može se izvršiti odabir metode imputacije, o kojima je više riječi bilo na prethodnim stranicama. SPSS nudi dvije

metode: prvu – MCMC, koja se primjenjuje kada podaci nedostaju po slučajnom mehanizmu, i drugu, koja se primjenjuje kada postoji monotonicitet. U ovom primjeru zadržana je automatska procjena metode, jer se u tom slučaju podaci skeniraju u odnosu na monotonicitet i ukoliko se on detektuje primjenjuje se drugi metod. Na kartici Constraints možemo podesiti da u okviru rezultata analize dobijemo i procenat nedostajućih podataka po varijabli i deskriptivne pokazatelje varijabli klikom na dugme Scan Data. Output kartica je posljednja u ovom prozoru i na njoj možemo čekirati sve tri ponuđene kućice. Ukoliko čekiramo opciju za kreiranje istorije iteracija u novoj matrici, toj novoj matrici moramo dati ime, na primjer iteracija.istorija.

U okviru ispisa rezultata, u tabeli Imputation Models može se vidjeti koji tip modela je primijenjen za koje varijable, a u skladu sa definisanim nivoom mjerenja, da li je primijenjena logistička ili linearna regresija. Pored navedenog, u tabli Imputation Models može se vidjeti i koji su se prediktori koristili za predikciju nedostajućih podataka u okviru svake varijable. Dio table Imputation Models iz našeg primjera dat je slikom broj 5.

Slika 5. Imputation Models

	Model		Missing Values	Imputed Values
	Type	Effects		
KOOI	Linear Regression	TL,LNNTPA, UL,RVF, RPONNTPA, KS,KOUI, ROA,ROOD, KFS,logGGE, ROP,NOKUS, NP_I,NP_II, NPM,BPM, KOZ,RPK,KP, RZ,ROE	3	15
ROOD		TL,LNNTPA, UL,RVF, RPONNTPA, KS,KOUI, ROA,KOOI, KFS,logGGE, ROP,NOKUS		

Izvor: izrada autora u SPSS-u

Nova matrica sa zamijenjenim vrijednostima, u gornjem desnom uglu, sadrži polje Original data sa padajućom listom koja daje pregled zamijenjenih podataka u svakoj imputaciji od 5 sprovedenih. Čelije sa zamijenjenim podacima su osjenčene. Dalja analiza i obrada podataka radi se nad zamijenjenim podacima dobijenim u petoj imputaciji.

U novijim istraživanjima preferiraju se metode koje se svrstavaju u grupu savremenih metoda, kao što su metode višestruke imputacije i maksimalne vjerodostojnosti. Ovo iz razloga što savremene metode daju manje pristrasne procjene u odnosu na tradicionalne, čak i kada podaci ne nedostaju po NMAR mehanizmu.

## ZAKLJUČAK

Na osnovu metoda koje su predstavljene u ovom radu, a koje se primjenjuju za eliminaciju nedostajućih podataka, može se zaključiti da je u savremenim uslovima istraživanja primjena metoda baziranih na brisanju nedostajućih podataka neadekvatna i da se kao takva ne preporučuje. Metode jednostruke imputacije, koje se takođe svrstavaju u grupu tradicionalnih metoda, zbog svojih nedostataka, u novijim istraživanjima o nedostajućim podacima rijetko se preporučuju. Međutim, treba istaći da nedostaci ovih metoda mogu da budu zanemarljivi u situacijama kada su ispunjeni određeni uslovi, kao što je, na primjer, situacija kada se utvrdi da nedostajući podaci nedostaju po MCAR mehanizmu i kada je broj nedostajućih podataka mali.

## IZVORI

1. Alison, P. (2002). *Missing data*. Sage University papers series on quantitative applications in the social sciences. Preuzeto sa: <https://assets.thalia.media/doc/f3/a7/f3a7a631-469a-4907-8740-6b16b2763f1d.pdf>
2. Bennett, A. (2001). How can I deal with missing data in my study? *Australian and New Zeland journal of public health*, 463–469. doi:<https://doi.org/10.1111/j.1467-842X.2001.tb00294.x>
3. Dong, Y., Peng, C. (2013). Principled missing data methods for researchers. *SpringerOpen Journal*, 2–17. Preuzeto sa: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3701793/>

is necessary to transfer the variables over which we want to perform multiple imputations from the Variables field to the Variables in Model field. The number of imputations can be changed in the Imputations field, but we have kept 5 imputations, as recommended in the literature. A matrix with replaced missing data can be saved as a new matrix or within an existing matrix. In this example, the matrix with the missing data replaced is saved as new with the name impute.matica

On the Method tab, you can select the imputation method, which was discussed more on the previous pages. SPSS offers two methods: 1. MCMC applicable when data are missing by random mechanism and 2. which is applied when there is monotony.

In this example, the automatic estimation of the method is retained, because in that case the data are scanned in relation to the

monotonicity, and if it is detected, another method is applied. On the Constraints tab, we can set the percentage of missing data by variables and descriptive indicators of variables by clicking on the Scan Data button. The output card is the last in this window and we can check all three offered boxes on it. If we check the option to create an iteration history in a new matrix, we must give that new matrix a name, for example iteration.history.

Within the printout of the results, in the table Imputation Models you can see which type of model was applied for which variables, and in accordance with the defined level of measurement - whether logistic or linear regression was applied. In addition to the above, in the Imputation Models panel you can see which predictors were used to predict the missing data within each variable. Part of the Imputation Models panel from our example is given in Figure 5.

**Figure 5 Imputation Models**

	Model		Missing Values	Imputed Values
	Type	Effects		
KOOI	Linear Regression	TL, LNNTPA, UL, RVF, RPONNTPA, KS, KOU, ROA, ROOD, KFS, logGGE, ROP, NOKUS, NP_I, NP_II, NPM, BPM, KOZ, RPK, KP, RZ, ROE	3	15
ROOD		TL, LNNTPA, UL, RVF, RPONNTPA, KS, KOU, ROA, KOOI, KFS, logGGE, ROP, NOKUS		

Source: author's work in the SPSS program

The new matrix with the replaced values, in the upper right corner, contains the Original data field with a drop-down list that gives an overview of the replaced data in each imputation of the 5 implemented. Cells with replaced data are shaded. Further analysis and data processing is performed on the replaced data obtained in the 5th imputation.

**CONCLUSION**

Based on the methods presented in this paper, which are used to eliminate missing data, it can be concluded that in modern research conditions the application of methods based on deleting missing data is inadequate and is not recommended as such.

Single imputation methods, which are also classified as traditional methods, are rarely recommended in recent research on missing data due to their shortcomings. However, it should be noted that the shortcomings of these methods can be negligible in situations where certain conditions are met, such as when the missing data are found to be missing under the MCAR mechanism and when the number of missing data is small.

Recent research has preferred methods that fall into the group of modern methods, such as methods of multiple imputation and maximum reliability. This is because modern methods give less biased estimates compared to traditional ones, even when data are not missing under the NMAR mechanism.

**LITERATURE**

1. Alison, P. (2002). *Missing data*. Sage University papers series on quantitative applications in the social sciences. Retrieved <https://assets.thalia.media/doc/f3/a7/f3a7a631-469a-4907-8740-6b16b2763f1d.pdf>
2. Bennett, A. (2001). How can I deal with missing data in my study? *Australian and New zeland journal of public health*, 463-469. doi:<https://doi.org/10.1111/j.1467-842X.2001.tb00294.x>
3. Dong, Y., & Peng, C. (2013). Principled missing data methods for researchers. *SpringerOpen Journal*, 2-17. Retrieved <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3701793/>
4. Donner, A. (1982). The Relative Effectiveness of Procedures Commonly Used in Multiple Regression Analysis for Dealing with Missing Values. *The American Statistician*, 378-381. Retrieved <https://www.tandfonline.com/doi/abs/10.1080/00031305.1982.10483055>
5. Enders, C. K. (2010). *Applied Missing Data Analysis*. New York: The Guilford Press. Retrieved [https://books.google.ba/books?hl=hr&lr=&id=MN8ruJd2tvgC&oi=fnd&pg=PA1&dq=missing+data+&ots=dKiBrV\\_js3&sig=J9Xjqsma1MAlyCENUkg9tOF6JM&redir\\_esc=y#v=onepage&q=missing%20data&f=false](https://books.google.ba/books?hl=hr&lr=&id=MN8ruJd2tvgC&oi=fnd&pg=PA1&dq=missing+data+&ots=dKiBrV_js3&sig=J9Xjqsma1MAlyCENUkg9tOF6JM&redir_esc=y#v=onepage&q=missing%20data&f=false)
6. Graham, J., Cumsile, P., & Elek-Fisk, E. (2003). Methods for hadnling missing data. *Handbook of Psychology*, 87-144. doi:10.1002/0471264385.wei0204

4. Donner, A. (1982). The Relative Effectiveness of Procedures Commonly Used in Multiple Regression Analysis for Dealing with Missing Values. *The American Statistician*, 378–381. Preuzeto sa: <https://www.tandfonline.com/doi/abs/10.1080/00031305.1982.10483055>
5. Enders, C. K. (2010). *Applied Missing Data Analysis*. New York: The Guilford Press. Preuzeto sa: [https://books.google.ba/books?hl=hr&lr=&id=MN8ruJd2tvG&oi=fnd&pg=PA1&dq=missing+data+&ots=dKiBrV\\_js3&sig=J9Xjqsmca1MAlyCENUkg9t0F6JM&redir\\_esc=y#v=onepage&q=missing%20data&f=false](https://books.google.ba/books?hl=hr&lr=&id=MN8ruJd2tvG&oi=fnd&pg=PA1&dq=missing+data+&ots=dKiBrV_js3&sig=J9Xjqsmca1MAlyCENUkg9t0F6JM&redir_esc=y#v=onepage&q=missing%20data&f=false)
6. Graham, J., Cumsile, P., Elek-Fisk, E. (2003). Methods for handling missing data. *Handbook of Psychology*, 87–144. doi:10.1002/0471264385.wei0204
7. Howard, J. (2013). *Using principal component analysis (PCA) to obtain auxiliary variables for missing data estimation in large data sets*. Lawrence: ProQuest LLC. Preuzeto sa: [https://www.researchgate.net/publication/263547743\\_Using\\_principal\\_component\\_analysis\\_PCA\\_to\\_obtain\\_auxiliary\\_variables\\_for\\_missing\\_data\\_estimation\\_in\\_large\\_data\\_sets](https://www.researchgate.net/publication/263547743_Using_principal_component_analysis_PCA_to_obtain_auxiliary_variables_for_missing_data_estimation_in_large_data_sets)
8. Ilić, D. (2012). *Ocenjivanje indeksa repa raspodele korišćenjem nekompletnih uzoraka*. Beograd: Matematički fakultet, Univerzitet u Beogradu. Preuzeto sa: <https://nardus.mpn.gov.rs/handle/123456789/2849?show=full>
9. Kang, H. (2013). The prevention and handling of the missing data. *Korean Journal of Anesthesiology*, 402–406. doi: 10.4097/kjae.2013.64.5.402
10. Khan, S., Hoque, L. (2020). SICE: an improved missing data imputation technique. *Journal of Big Data*, 7–37. Preuzeto sa: <https://journalofbigdata.springeropen.com/articles/10.1186/s40537-020-00313-w>
11. Lang, M., Little, D. (2018). Principled Missing Data Treatments. *Prevention Science*, 284–294. doi:<https://doi.org/10.1007/s11121-016-0644-5>
12. Newman, D. (2003). Longitudinal Modeling with Randomly and Systematically Missing Data: A Simulation of Ad Hoc, Maximum Likelihood, and Multiple Imputation Techniques. *Organizational Research Methods*, 328–362. Preuzeto sa <https://journals.sagepub.com/doi/10.1177/1094428103254673>
13. Oblaković, M., Sokolovska, V., Dinić, B. (2015). Tretmani nedostajućih podataka. *Primenjena psihologija*, 289–309. doi:10.19090/str.2015.3.289-309
14. Rubin, D., Little, R. (2002). *Statistical Analysis with Missing Data*, Second Edition. New Jersey: John Wiley & Sons, Inc. Preuzeto sa: <https://onlinelibrary.wiley.com/doi/book/10.1002/9781119013563>
15. Schafer, J., Graham, J. (2002). Missing data: Our view of the state of the art. *Psychological Methods*. doi:10.1037/1082-989X.7.2.147
16. Schafer, L. (1999). Multiple imputation: a primer. *Statistical Methods in Medical Research*, 3–15. doi:<https://doi.org/10.1177/096228029900800102>
17. Sunil, R. (2016). *A Comprehensive Guide to Data Exploration*.
18. Swalin, A. (2018). *How to Handle Missing Data*. Preuzeto sa: <https://towardsdatascience.com/how-to-handle-missing-data-8646b18db0d4>
19. Tabachnick, B., Fidell, L. (2001). *Using multivariate statistic* (4th edition). Allyn and Bacon, Boston.
20. Tabachnick, G., Fidell, L. (2013). *Using Multivariate Statistics*. Pearson Education.
21. Vasić, V. (2018). Rešavanja problema multivariacionih nedostajućih anketnih podataka primenom EM algoritma. *Ekonomске ideje i praksa*, 35–50. Preuzeto sa: <http://www.ekof.bg.ac.rs/wp-content/uploads/2014/10/003.pdf>
22. Warnes, Z. (2021, July 6). *Missing Value Handling – Missing Data Types*. Preuzeto sa: Towards Data Science: <https://towardsdatascience.com/missing-value-handling-missing-data-types-a89c0d81a5bb>
23. Xian, L. (2016). *Methods and Applications of Longitudinal Data Analysis*. Academic Press. doi:<https://doi.org/10.1016/C2013-0-13082-6>

7. Howard, J. (2013). *Using principal component analysis (PCA) to obtain auxiliary variables for missing data estimation in large data sets*. Lawrence: ProQuest LLC. Retrieved [https://www.researchgate.net/publication/263547743\\_Using\\_principal\\_component\\_analysis\\_PCA\\_to\\_obtain\\_auxiliary\\_variables\\_for\\_missing\\_data\\_estimation\\_in\\_large\\_data\\_sets](https://www.researchgate.net/publication/263547743_Using_principal_component_analysis_PCA_to_obtain_auxiliary_variables_for_missing_data_estimation_in_large_data_sets)
8. Ilić, D. (2012). *Ocenjivanje indeksa repa raspodele korišćenjem nekompletnih uzoraka*. Beograd: Matematički fakultete, Univerzitet u Beogradu. Preuzeto sa <https://hardus.mpn.gov.rs/handle/123456789/2849?show=full>
9. Kang, H. (2013). The prevention and handling of the missing data. *Korean Journal of Anesthesiology*, 402-406. doi: 10.4097/kjae.2013.64.5.402
10. Khan, S., & Hoque, L. (2020). SICE: an improved missing data imputation technique. *Journal of Big Data*, 7-37. Retrieved <https://journalofbigdata.springeropen.com/articles/10.1186/s40537-020-00313-w>
11. Lang, M., & Little, D. (2018). Principled Missing Data Treatments. *Prevention Science*, 284-294. doi:<https://doi.org/10.1007/s11121-016-0644-5>
12. Newman, D. (2003). Longitudinal Modeling with Randomly and Systematically Missing Data: A Simulation of Ad Hoc, Maximum Likelihood, and Multiple Imputation Techniques. *Organizational Research Methods*, 328-362. Retrieved <https://journals.sagepub.com/doi/10.1177/1094428103254673>
13. Oblaković, M., Sokolovska, V., & Dinić, B. (2015). Tretmani nedostajućih podataka. *Primenjena psihologija*, 289-309. doi:10.19090/str.2015.3.289-309
14. Rubin, D., & Little, R. (2002). *Statistical Analysis with Missing Data*, Second Edition. New Jersey: John Wiley & Sons, Inc. Retrieved <https://onlinelibrary.wiley.com/doi/book/10.1002/9781119013563>
15. Schafer, J., & Graham, J. (2002). Missing data: Our view of the state of the art. *Psychological Methods*. doi:10.1037/1082-989X.7.2.147
16. Schafer, L. (1999). Multiple imputation: a primer. *Statistical Methods in Medical Research*, 3-15. doi:<https://doi.org/10.1177/096228029900800102>
17. Sunil, R. (2016). *A Comprehensive Guide to Data Exploration*.
18. Swalin, A. (2018). *How to Handle Missing Data*. Retrieved <https://towardsdatascience.com/how-to-handle-missing-data-8646b18db0d4>
19. Tabachnick, B., & Fidell, L. (2001). *Using multivariate statistic* (4th edition). Allyn and Bacon, Boston.
20. Tabachnick, G., & Fidell, L. (2013). *Using Multivariate Statistics*. Pearson Education.
21. Vasić, V. (2018). Rešavanje problema multivarijacionih nedostajućih anketnih podataka primenom EM algoritma. *Ekonomске ideje i praksa*, 35-50. Retrieved <http://www.ekof.bg.ac.rs/wp-content/uploads/2014/10/003.pdf>
22. Warnes, Z. (2021, July 6). *Missing Value Handling — Missing Data Types*. Retrieved Towards Data Science: <https://towardsdatascience.com/missing-value-handling-missing-data-types-a89c0d81a5bb>
23. Xian, L. (2016). *Methods and Applications of Longitudinal Data Analysis*. Academic Press. doi:<https://doi.org/10.1016/C2013-0-13082-6>





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PREGLEDNI RAD

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# Kontroverznost instituta probijanja pravne ličnosti društava kapitala u kompanijskom pravu

## Controversy of the ‘Piercing the Corporate Veil’ Institute in Limited Companies in the Company Law

### Rezime

U teorijskom, zakonodavnom i praktičnopravnom smislu, probijanje pravne ličnosti predstavlja vrlo kontroverzan institut kompanijskog prava. Sa pravne tačke gledišta, njegova kontroverznost se ispoljava već u samoj srži ovog instituta, koja dovodi do svojevrstne ekspanzije u pogledu odgovornosti članova društva kapitala, odnosno, preciznije, do povećanja u obimu njihove odgovornosti sa ograničene na neograničenu. Uporedna kompanijskoppravna regulativa ovog instituta pokazuje različite pristupe, od onih koji njegov značaj i postojanje u potpunosti priznaju do onih koji ga u cijelosti negiraju. Primjetno je da pravna pažnja koja se ovom institutu poklanja umnogome zavisi od stepena razvijenosti zemalja čije zakonodavstvo reguliše predmetnu materiju. Tako države sa visokim nivoom pravne sigurnosti i kulture ne poznaju institut probijanja pravne ličnosti u zakonodavnom smislu, već njegovu „regulaciju“ najčešće uobličavaju kroz sudske odluke bazirane na odgovarajućim sudskim precedentima i praksi, ili traže oslonac u provjerenim relevantnim pravnim teorijama, ili ga pak posredno ispoljavaju kroz primjenu odgovarajućih građanskopravnih instituta, poput delikta. Međutim, nasuprot tome, države čija kompanijskoppravna regulativa nije na tako zavidnom nivou, kao što je slučaj sa Republikom Srpskom, pokazuju izvjesnu opredijeljenost ka ozakonjenju ovog instituta kroz opštu definiciju, odnosno kombinaciju generalne formule i karakterističnih praktičnih slučajeva. Ipak, srpsko pravosuđe pokazuje određenu skeptičnost i konzervativnost u primjeni ovog instituta, koju iskazuje kroz postavljanje neopravdano visokih dokaznih tereta za tužioca (povjerioca društva kapitala), što za posljedicu ima otežano dokazivanje ispunjenosti uslova njegove primjene. Vodeći se gorenavedenim delikatnim i kompleksnim pitanjima, odlučili smo da se pozabavimo dubljom analizom instituta probijanja pravne ličnosti, u nadi da će određena autorova zapažanja, sugestije i stavovi u ovom naučnom radu poslužiti kao instrument za rasvjetljavanje složenih problema čije izvorište pronalazimo u predmetnom institutu.

**Ključne riječi:** probijanje pravne ličnosti, kontroverznost instituta, povećanje u obimu odgovornosti sa ograničene na neograničenu, otežano dokazivanje.

### Abstract

In theoretical, legislative and practical legal terms, „lifting the veil“ or „piercing the corporate veil“ is a very controversial institute of company law. From the legal point of view, its controversy is already manifested in the very core of this institute, which leads to a kind of expansion in terms of liability of members of limited companies, or more precisely, to increase the scope of their liability from limited to unlimited. The comparative company law regulations of this institute show different approaches, from those that fully recognize its importance and existence to those that completely deny it. It is noticeable that the legal attention paid to this institute largely depends on the level of development of the countries whose legislation regulates the subject matter. Thus, states with a high level of legal security and culture do not know the institute of „piercing the corporate veil“ in the legislative sense, but most often shape its “regulation” through court decisions based on appropriate court precedents and practice, or seek support in proven relevant legal theories or they manifest it indirectly through the application of appropriate civil law institutes such as torts. However, in contrast, countries whose company regulations are not at such an enviable level, as is the case with the Republika Srpska, show a certain commitment to legalizing this institute through a general definition, i.e. a combination of general formula and characteristic practical cases. However, the Republic of Srpska judiciary shows a certain skepticism and conservatism in the application of this institute, which it expresses by placing unjustifiably high evidence burdens on the prosecutor (creditor of the limited company), which results in difficult proof of fulfilling the conditions of its application. Guided by the above delicate and complex issues, we decided to engage in a deeper analysis of the institute of „piercing the corporate veil“, in the hope that certain author’s observations, suggestions and views in this scientific work will serve as an instrument for clarifying complex issues whose source we find in the subject institute.

**Keywords:** piercing the corporate veil, controversy of the institute, increase in the scope of liability from limited to unlimited, difficult to prove

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## UVOD

Da bismo pravilno objasnili suštinu kontroverznosti instituta probijanja pravne ličnosti, moramo krenuti od njegove terminologije. Zakonom o privrednim društvima Republike Srpske nije izričito naslovljen institut kojim se krši osnova principa ograničene odgovornosti članova društva kapitala, nego je iskorišćen generičan termin „zloupotreba pravnog lica“, u kome je predviđeno da komanditori komanditnog društva, kao i članovi društva sa ograničenom odgovornošću i akcionari akcionarskog društva mogu prema trećim licima lično odgovarati za obaveze društva ako zloupotrijebe privredno društvo za nezakonite ili prevarne ciljeve ili ako imovinom privrednog društva raspoložu kao sopstvenom imovinom na način kao da privredno društvo kao pravno lice ne postoji, što za posljedicu ima da se opšti princip ograničene odgovornosti ne primjenjuje na pomenuta lica.<sup>1</sup> Primjetno je da zakonodavac, između ostalog, navodi i komanditore komanditnog društva kao lica koja mogu ugroziti princip ograničene odgovornosti. Uvažavajući činjenicu da se komanditna društva u našem zakonu svrstavaju u kategoriju društava lica, a u cilju pojednostavljenja materije, autor će u nastavku teksta koristiti izraz „društva kapitala“, s tim da pomenuti termin u kontekstu ovog rada obuhvata, pored društava sa ograničenom odgovornošću i akcionarskih društava, i komanditna društva, ali samo u onom dijelu koji se odnosi na komanditore, budući da komplementari svakako odgovaraju svojom cjelokupnom imovinom za obaveze društva. U skladu s tim, u dotičnom naučnom radu, izrazom „članovi društva kapitala“ označavaće se članovi društva sa ograničenom odgovornošću, akcionari akcionarskog društva, ali i komanditori komanditnog društva<sup>2</sup>.

Nasuprot opštoj definiciji ovog instituta koja je prisutna u našem pravu, zakonodavac iz Republike Srbije precizno je i koncizno naslovio institut kojim se princip ograničene odgovornosti narušava, dajući mu naziv „probijanje pravne ličnosti“, čime je doprinio njegovom značaju i prepoznatljivosti, i time bolje objasnio magnitudu uticaja predmetnog instituta na odgovornost članova društva kapitala. Tako se Zakonom o privrednim društvima Republike Srbije propisuje da komanditor, član društva s ograničenom odgovornošću i akcionar, kao i zakonski zastupnik tog lica ako je ono poslovno nesposobno fizičko lice, koji zloupotrijebi pravilo o ograničenoj odgovornosti, odgovara za obaveze društva, a naročito se smatra da postoji zloupotreba ako to lice upotrijebi društvo za postizanje cilja koji mu je inače zabranjen, zatim ako koristi imovinu društva ili njome raspoložuje kao da je njegova lična imovina, ukoliko koristi društvo ili njegovu imovinu u cilju oštećenja povjerenika društva, te ako radi sticanja koristi za sebe ili treća lica umanjim imovinu društva, iako je znalo ili moralo znati da društvo neće moći da izvršava svoje obaveze.<sup>3</sup> Kao izuzetak od inače apsolutnog pravila ograničene odgovornosti članova društva kapitala, jedno vrijeme je bio aktuelan i izraz „zloupotreba pravnog subjektiviteta“. Međutim, pravnologički posmatrano, „zloupotreba pravnog subjektiviteta“ više ukazuje na osnov instituta, dok termin „probijanje pravne ličnosti“ na posljedicu takve zloupotrebe, tako da bi praktično za ukus kontinentalnog pravnika romanske tradicije najbolji bio njihov spoj, uz modifikaciju izraza „zloupotreba pravnog subjektiviteta“ u „zloupotreba ograničene odgovornosti“, što bi najpreciznije odražava-

valo i osnov i posljedicu (Vasiljević, 2020). Ipak, u cilju sprečavanja dodatnog usložnjavanja tematike predmetnog instituta, a zbog već spomenutih prednosti u terminologiji koja se koristi u zakonodavstvu Srbije, autor će se u nastavku svog naučnog rada koristiti izrazom „probijanje pravne ličnosti“ za označavanje izuzetka od principa ograničene odgovornosti članova društva kapitala.

Po pravilu, pravni subjektivitet društava kapitala odlikuje princip ograničene odgovornosti članova za rizik poslovanja. Međutim, institut probijanja pravne ličnosti predstavlja odstupanje od tog pravila, čime stvara posebnu sferu kompanijskog prava koju obilježavaju neka vrlo kontroverzna pitanja. U ovoj sferi kompanijskog prava izuzetno je bogata sudska praksa koja pokušava da dokuči i otkrije sve tajne ovog instituta, a pravna doktrina se u najvećoj mjeri bavi kritičkom analizom sudskih odluka, a u manjoj mjeri predstavlja i doktrinarnu elaboraciju ekonomske baze ograničene odgovornosti i pravne sigurnosti osnivača i kasnijih članova, koji jedino svojim nepoštovanjem principa ograničene odgovornosti članova društva kapitala mogu ugroziti sam princip i otvoriti put za primjenu njegovog korektora, odnosno do instituta probijanja pravne ličnosti (Vasiljević, 2020). Ovo i predstavlja logičan slijed okolnosti, uzimajući u obzir da društva kapitala imaju sopstveni pravni subjektivitet, posluju namjenskom imovinom, te samostalno preuzimaju obaveze institutom zastupanja u pravnom saobraćaju. Prema tome, vlasnike (osnivače, akcionare, članove) ovih formi privrednih društava, nezavisno od toga da li je riječ o pravnim ili fizičkim licima, štiti tzv. „ograda – veo“ njihove pravne ličnosti, čime im se stvara svojevrsna pravna garancija da povjerioci društva kapitala neće moći da naplate svoja potraživanja prema društvu iz njihove lične imovine.

Ipak, činjenica da pravni subjektivitet i pravilo ograničene odgovornosti članova društva kapitala prati „anomalija“ iskristalisana kroz institut probijanja pravne ličnosti, otvara pitanje vrste imperativnosti norme o ograničenoj odgovornosti. Naime, diskutabilno je da li je riječ o apsolutnom imperativnom pravilu koje ne dozvoljava nikakva odstupanja, ili se pak radi o relativnom imperativnom pravilu koje dopušta određene izuzetke koji nastaju kao posljedica faktičkih okolnosti datog ugovornog ili deliktne slučaja. Činjenica da je institut probijanja pravne ličnosti upravo izuzetak od pravila o ograničenoj odgovornosti članova društva kapitala, kvalifikuje ovo pravilo u drugu kategoriju, s tim da do njega ne dolazi tzv. „zakonskom voljom“, već voljom učesnika pravnog posla. Prema tome, zavisno od toga da li je pravilo ograničene odgovornosti članova društva kapitala upotrijebljeno u legitime ili nelegitimne svrhe, zavisice i primjena instituta probijanja pravne ličnosti kao izuzetka od tog pravila. Dakle, pravilo ograničene odgovornosti članova društva kapitala predstavlja apsolutnu kategoriju kada se koristi u zakonskim okvirima, odnosno kada se pravna ličnost društva kapitala ne koristi za nezakonite ciljeve (oštećenje povjerenika, miješanje imovine sa imovinom vlasnika, prevarne radnje i sl.). Međutim, istupanjem iz tih zakonodavnih granica ovo pravilo postaje „ranjivo“ i opravdano ustupa mjesto njegovom izuzetku – institutu probijanja pravne ličnosti, koje proširuje teren odgovornosti članova društva za obaveze društva kapitala i izvan ovog zakonskog ograničenja, ali time ujedno osiromašuje prednosti društava kapitala nad formama društava lica.

<sup>1</sup> Član 15. stavovi 1. i 3. Zakona o privrednim društvima Republike Srpske („Službeni glasnik Republike Srpske“ br. 127/2008, 58/2009, 100/2011, 67/2013, 100/2017. i 82/2019).

<sup>2</sup> Komanditno društvo, u smislu Zakona o privrednim društvima Republike Srpske, jeste privredno društvo koje osnuju dva ili više fizičkih i/ili pravnih lica u svojstvu ortak, radi obavljanja određene djelatnosti, pod zajedničkim poslovnim imenom, od kojih najmanje jedno lice odgovara neograničeno za njegove obaveze (komplementar), a najmanje jedno lice snosi rizik do visine svog ugovorenog uloga (komanditor). Budući da u redovnim okolnostima komanditori ne odgovaraju svojom cjelokupnom imovinom za obaveze društva, a uzimajući u obzir poentu postojanja instituta probijanja pravne ličnosti, postaje evidentno zbog čega je naš zakonodavac obuhvatio i ova lica kao potencijalnu kategoriju na koju se može primijeniti izuzetak od principa ograničene odgovornosti.

<sup>3</sup> Član 18. stavovi 1. i 2. Zakona o privrednim društvima Republike Srbije („Službeni glasnik Republike Srbije“ br. 36/2011, 99/2011, 83/2014 – dr. zakon, 5/2015, 44/2018, 95/2018, 91/2019. i 109/2021).

## INTRODUCTION

In order to correctly explain the essence of the controversy of the „piercing the corporate veil“ institute, we must start from its terminology. The Company Law of Republic of Srpska does not explicitly address the institute which violates the principle of limited liability of members of limited companies, but uses the generic term “abuse of legal entity” which provides for limited partners, as well as members of limited liability companies and the shareholders of a joint stock company may be personally liable to third parties for the obligations of the company if they misuse the company for illegal or fraudulent purposes or if they dispose of the company’s property as their own property as if the company did not exist as a legal entity and as a consequence, the general principle of limited liability does not apply to the mentioned persons.<sup>1</sup> It is noticeable that the legislator, among other things, mentions the limited partners of limited partnerships as persons who may endanger the principle of limited liability. Considering the fact that limited partnerships in our law are classified as partnerships, and in order to simplify the matter, the author will use the term limited companies in the following text, provided that the term in the context of this paper includes, in addition to limited liability companies and joint stock companies also limited partnerships, but only in the part that refers to limited partners, since general partners are certainly liable with their entire assets for the company’s obligations. Accordingly, in the respective scientific paper, the term members of a limited company shall mean members of a limited liability company, shareholders of a joint stock company, but also limited partners of a limited partnership<sup>2</sup>.

Contrary to the general definition of this institute that is present in our law, the legislator from the Republic of Serbia precisely and concisely titled the institute which violates the principle of limited liability, giving it the name “piercing the corporate veil”, thus contributing to its importance and recognizability and thus better explained the magnitude of the influence of the institute in question on the liability of the members of the limited company. Thus, the Company Law of the Republic of Serbia stipulates that a limited partner, member of a limited liability company and shareholder, as well as the legal representative of that person if he is a natural person without legal capacity who abuses the limited liability rule is liable for the company’s obligations and in particular it is considered that there is abuse if that person uses the company to achieve a goal that is otherwise prohibited, then if he uses the company’s assets or disposes of it as if it were his personal property, if he uses the company or its assets to harm creditors, and if for the benefit of himself or third parties, reduces the company’s assets, even though he knew or should have known that the company will not be able to meet its obligations.<sup>3</sup> As an exception to the otherwise absolute rule of limited liability of members of a limited company, the term “abuse of legal subjectivity” was also relevant for some time. However, from a legal and logical point of view, “abuse of legal subjectivity” indicates more on the basis of the institute, while the term “piercing the corporate veil” is a consequence of such abuse, so for a continental lawyer of Roman tradition, their combination would be best with the modification of the expression “abuse of legal personality” into “abuse of limited liability”, which would most accurately reflect both the basis and the consequence

(Vasiljevic, 2020) However, in order to prevent further complication of the subject of the institute, and due to the already mentioned advantages in the terminology used in Serbian legislation, the author will continue in his scientific work to use the term “piercing the corporate veil” to indicate an exception to the principle of limited liability of members of a limited company.

As a rule, the legal subjectivity of limited companies is characterized by the principle of limited liability of members for business risk. However, the institute of “piercing the corporate veil” is a deviation from that rule, thus creating a special sphere of company law marked by some very controversial issues. In this sphere of company law, there is an extremely rich jurisprudence that tries to understand all the secrets of this institute, and legal doctrine mostly deals with critical analysis of court decisions, and to a lesser extent the doctrinal elaboration of the economic base of limited liability and legal security of founders and later members, who only by disrespecting the principle of limited liability of members of the limited company can endanger the principle itself and enable the application of its corrector, ie the institute of “piercing the corporate veil” (Vasiljevic, 2020). This is a logical sequence of circumstances, taking into account that limited companies have their own legal personality, operate with special-purpose assets, and independently take on obligations through the institute of representation in legal transactions. Therefore, the owners (founders, shareholders, members) of these forms of companies, regardless of whether they are legal or natural persons, are protected by the so-called “fence-veil” of their legal personality, which creates a kind of legal guarantee that creditors will not be able to collect their claims against the company from their personal property.

However, the fact that the legal subjectivity and the rule of limited liability of members of limited companies is accompanied by an “anomaly” crystallized through the “piercing the corporate veil” institute, raises the question of the kind of imperative norm of limited liability. Namely, it is debatable whether this is an absolute imperative rule that does not allow any deviations, or whether it is a relative imperative rule that allows certain exceptions that arise as a result of the factual circumstances of a contractual or tort case. Due to the fact that the „piercing the corporate veil“ institute is an exception to the rule on limited liability of members of a limited company, qualifies this rule in the second category, provided that it does not come by the so-called “legal will”, but by the will of the participants in the legal transaction. Therefore, depending on whether the rule of limited liability of members of a limited company has been used for legitimate or illegitimate purposes, the application of the „piercing the corporate veil“ institute will also depend as an exception to that rule. Thus, the rule of limited liability of members of a limited company is an absolute category when used within the legal framework, ie when the legal personality of a limited company is not used for illegal purposes (damage to creditors, mixing assets with owner’s assets, fraud, etc.). However, by stepping out of these legislative boundaries, this rule becomes “vulnerable” and justifiably gives way to its exception - the „piercing the corporate veil“ institute, which expands the scope of liability of company members for the obligations of limited companies and beyond this legal limit, but thus reduces the advantages of limited companies in comparison with partnerships.

<sup>1</sup> Article 15, paragraphs 1 and 3 of the Company Law of Republic of Srpska („Official Gazette of the Republic of Srpska“, No. 127/2008, 58/2009, 100/2011, 67/2013, 100/2017 and 82/2019).

<sup>2</sup> A limited partnership under the Company Law of Republic of Srpska is a company founded by two or more natural and/or legal persons thereby gaining the status of partners of the company with the aim to conduct business under a common business name and in which at least one partner’s liability is unlimited (a “general partner”) and at least one partner’s liability is limited to the height of his agreed contribution (a “limited partner”). Since in regular circumstances limited partners are not liable with their entire assets for the company’s obligations, and taking into account the point of existence of the “piercing the corporate veil”, it becomes evident why our legislator included these persons as a potential category to which the exception of limited liability can be applied.

<sup>3</sup> Article 18 paragraphs 1 i 2 of Company Law of Republic of Serbia („Official Gazette of the Republic of Serbia“, No. 36/2011, 99/2011, 83/2014, 5/2015, 44/2018, 95/2018, 91/2019 and 109/2021).

## 1. PREGLED LITERATURE

Pravilo ograničene odgovornosti je, u suštini, generalno i u principu zatvoreno, čime se ograničava poslovni rizik investitora i time posljedično podstiče investiranje i tržište kapitala (Glynn, 2004), smanjuju se troškovi investiranja, povećava pravna sigurnost investitora, afirmiše se predvidljivost sa mogućnošću utvrđivanja dometa *ex ante*, obezbjeđuje se koncentracija kapitala više investitora i zaštita vlasničkih i upravljačkih prava, osigurava izbor između više pravnih formi organizovanja zavisno od potreba investitora, jača transparentnost poslovanja otvorenih društava, omogućava se transfer vlasničkih prava, povećava likvidnost investicija, obezbjeđuje specijalizacija upravljanja i odvajanja vlasništva od upravljanja itd. (Ramsay, Noakes, 2001).

Imajući u vidu ulogu ustanove ograničene odgovornosti, ne čudi što je jedan dio pravne teorije pokazao tendenciju za njeno ukidanje, navodeći nepreciznost instituta, nesigurnost i arbitrarnost primjene, odvrtačući efekat od investiranja, te mogućnost postizanja istih rezultata pomoću opštih pravnih instituta i standarda kao osnovne razloge koje opravdavaju njihova zalaganja (Bainbridge, 2005). Ipak, postoje i umjereniji protivnici ove ustanove koji predlažu da se predmetni institut u odgovarajućim oblastima ukine, ili barem značajno ublaži restrikcijom osnova primjene ili užim poimanjem njegovog djelokruga (Smith, 2008). Tako npr., po njihovom tumačenju, oblast koja u prvom redu zaslužuje opisani drugačiji tretman vezana je za finansijski privredni sektor. Njega karakteriše jednostrana dominacija u ugovornim odnosima (banke, osiguravajuća društva), što djeluje kao olakšavajući faktor u zaštiti poslovnih interesa. Ako na to dodamo činjenicu da je ova oblast regulisana posebnim propisima, postaje očigledna suvišnost upotrebe kompanijskopravne ustanove probijanja pravne ličnosti u konkretnom slučaju.

Svakako da zaštitno dejstvo pravnog subjektiviteta predstavlja vrlo značajan princip kompanijskog prava, koji kroz ograničenje rizika i smanjenje troškova podstiče razvoj tržišne ekonomije i slobodu preduzetništva. Iako je nesporno da ove važne ekonomske postulate garantuje pravo, bitno je istaći da pravna zaštita djeluje samo do onog nivoa do kog navedeni postulati vrše svoju funkciju i podržavaju ekonomiju. Prekoračenjem pravno utemeljenih granica aktivira se institut probijanja pravne ličnosti kao rezervni pravni mehanizam, čime se proširuje obim odgovornosti članova društva kapitala koji inače odgovaraju ograničeno do visine svog uloga u dato društvo. Da bi aktivacija predmetnog instituta nastupila, neophodan je dokaz tužioca, odnosno povjerioca društva kapitala da je došlo do zlopotrebe pravnog subjektiviteta društva kapitala od strane tuženog (člana društva), s tim da je ovdje riječ o tzv. đavolskom dokazivanju (*probatio diabolica*) budući da je dokazni prag za tužioca izuzetno visoko postavljen (Wibberley et al., 2014). Pritom, prilikom odlučivanja u pravnoj stvari probijanja pravne ličnosti sudiji je povjerena velika arbitarna moć, a isti ima obavezu da utvrdi sve relevantne činjenice koje bi eventualno opravdale sprovođenje ovog instituta, te da, ukoliko zaključi da one postoje, procijeni stepen njihovog uticaja u kontekstu predmetnog instituta i time značaja za njegovu primjenu, ili u suprotnom, odluči se za poštovanje pravnog subjektiviteta i principa ograničene odgovornosti i time isključi primjenu izuzetka sadržanog u ovom standardu. Međutim, zbog nepostojanja konciznih smjernica koje bi predstavljale vodilju u određivanju stepena dejstva protumačenih činjenica na potencijalno zanemarivanje pravnog subjektiviteta društava kapitala ili pak na njegovo poštovanje, nije iznenađujuće što dva suda mogu zauzeti potpuno oprečna mišljenja u ovoj materiji.

U suštini, probijanje pravne ličnosti predstavlja institut do čije aktivacije može doći nezavisno od oblika privrednog društva, pod uslovom da kod njih važi princip ograničene odgovornosti. O kojim privrednim društvima će u konkretnom smislu biti riječ zavisi od svakog nacionalnog prava ponaosob, odnosno od njegovog poznavanja različitih formi privrednih društava, te isti može obuhvatiti društva sa ograničenom odgovornošću, akcionarska društva (otvorena i zatvorena), komanditore komanditnog društva, ortakluke sa ograničenom odgovornošću itd. Ipak, iskustva sudske prakse pokazuju da se ovaj institut primjenjuje najviše kod formi zatvorenih društava (Glynn, 2004), posebno onih sa manjim brojem članova, za razliku od otvorenih društava, gdje je njegova primjena u suštini svedena na društva sa manjim brojem akcionara (Esterbrook, Fishel, 1985). S tim u vezi, prisutnost instituta probijanja pravne ličnosti najčešća je kod jednočlanih društava (Cohn, Simitis, 1963) ili društava sa manjim brojem članova i faktički je predmetni institut neprisutan kod javnih korporacija sa velikim brojem akcionara (Renno, 2014). Zajedničko za sva ova privredna društva jeste to da njihovi članovi postupaju nesavjesno, do te mjere da namjerno koriste prevarne radnje, čime direktno krše osnovu principa ograničene odgovornosti koja nalaže njihovo savjesno postupanje (Sedillo Lopez, 1982).

## 2. REZULTATI ISTRAŽIVANJA I DISKUSIJA

### 2.1. Probijanje pravne ličnosti sa aspekta kompanijskog prava

Ustanova probijanja pravne ličnosti predstavlja poseban institut kompanijskog prava. Intencija zakonodavca pri uvođenju predmetnog instituta u naše zakonodavstvo prevashodno je motivisana željom da se ugrozi „suverenitet“ standarda ograničene odgovornosti članova društva za obaveze društva kapitala, kako bi se oni, snagom autoriteta zakona, zbog vlastitog nepoštovanja tog standarda i autonomnosti svog društva kao posebnog pravnog subjekta, priveli „pravdi neograničene odgovornosti“ za obaveze svog društva prema povjeriocima njihovog društva, čime se ujedno obezbjeđuje i povećana sigurnost za povjerioce i dodatna sankcija za članove društva kapitala. Na taj način uspostavlja se specifičan pravni odnos *ipso iure*<sup>4</sup> između lica koja nisu u pravnom odnosu (nema pravnog posla u korist ili na teret trećeg lica kad je inače pravno moguće) i koja su međusobno treća lica – član društva i povjerilac društva, bez izražavanja volje učesnika ovog odnosa, kao i bez izražavanja volje samog društva (Vasiljević, 2020). Prema tome, namjera zakonodavca u zemljama koje su ovaj institut ozakonile, kao i praksa u zemljama koje to nisu učinile ispoljena je u težnji da se članovi društva kapitala sankcionišu ili za nesavjesno ponašanje prema svom društvu, ili za zloupotrebu principa ograničene odgovornosti za obaveze prema društvu, budući da se na ovaj način ugrožava autonomija i suverenitet pravnog subjektiviteta društva i njegove imovine. Na ovoj osnovi, zakon ili praksa konstituišu institut probijanja pravne ličnosti, prilikom čega izraz „probijanje“ ima dvostruku funkciju: najprije član društva neosnovano „ulazi u zabran društva kao pravnog subjekta i njegove imovine“, a onda se kao posljedica toga daje pravo povjeriocu društva da „uđe u zabran člana društva kao pravnog subjekta ili fizičkog lica i njegove imovine“ kako bi naplatio svoje potraživanje od svog ugovornog partnera (Vasiljević, 2020).

Ipak, potreba postojanja ustanove probijanja pravne ličnosti često se dovodi u pitanje. Osnovne pokretače koji čine upitnim egzistenciju predmetnog instituta možemo pronaći u sferi deliktne i ugovornog

<sup>4</sup> U rimskoj pravnoj tradiciji, izraz *ipso iure* označava radnju kojom određeni pravni odnos, odnosno pravo i obaveza, nastaje, mijenja se ili prestaje direktno po sili zakona ili drugog pravnog propisa, bez ikakve potrebe da se o tome donosi poseban pravni akt ili da se preuzima posebna pravna radnja.

## 1. LITERATURE OVERVIEW

The rule of limited liability is, in essence, generally and in principle closed, which limits the business risk of investors and thus encourages investment and capital markets (Glynn, 2004), reduces investment costs, increases legal certainty for investors, affirms predictability with the ability to determine the range *ex ante*, provides concentration of capital of several investors and protection of ownership and management rights, ensures choice between several legal forms of organization depending on the needs of investors, strengthens transparency of open companies, enables transfer of ownership rights, increases liquidity of investments, provides management specialization and separation of ownership and management, etc. (Ramsay, Noakes, 2001).

Given the role of the limited liability institute, it is not surprising that one part of legal theory has shown a tendency to abolish it, citing the inaccuracy of the institute, uncertainty and arbitrariness of application, discouraging investment, and the possibility of achieving the same results with general legal institutes and standards as the underlying reasons justifying their efforts (Bainbridge, 2005). However, there are more moderate opponents of this institute who suggest that the institute in question be abolished in appropriate areas, or at least significantly mitigated by restricting the basis of application or a narrower understanding of its scope (Smith, 2008). Thus, for example, according to their interpretation, the area that primarily deserves the described different treatment is related to the financial sector. It is characterized by unilateral domination in contractual relations (banks, insurance companies) which acts as a mitigating factor in the protection of business interests. If we add to that the fact that this area is regulated by special regulations, the redundancy of the use of the „piercing the corporate veil“ institute in a specific case becomes obvious.

Certainly, the protective effect of legal subjectivity is a very important principle of company law, which through risk reduction and cost reduction encourages the development of a market economy and freedom of enterprise. Although it is indisputable that these important economic postulates are guaranteed by law, it is important to point out that legal protection works only to the extent to which these postulates perform their function and support the economy. Exceeding the legally established boundaries activates the „piercing the corporate veil“ institute as a reserve legal mechanism, which expands the scope of liabilities of members of the limited company who are otherwise liable to a limited amount of their share in the company. In order for the activation of the institute in question to occur, it is necessary for the plaintiff, ie the creditor of the limited company, to prove that the legal subjectivity of the limited company was abused by the defendant (member of the company), with the so-called diabolical proving (*probatio diabolica*) since the evidentiary threshold for the plaintiff is extremely high (Wibberley et al., 2014). At the same time, when deciding on the legal matter of the „piercing the corporate veil“ institute, the judge is entrusted with great arbitrary power, and he has the obligation to determine all relevant facts that could justify the implementation of this institute, and to assess the degree of their influence in the context of the institute in question and thus relevant to its application, or otherwise, decides to respect legal personality and the principle of limited liability and thus excludes the application of the exception contained in this standard. However, due to the lack of concise guidelines that would guide the determination of the degree of effect of interpreted facts on the potential disregard for legal respect for limited companies or respect for it, it is not surprising that the two courts can take completely conflicting opinions in this matter.

In essence, the „piercing the corporate veil“ is an institute whose activation can take place regardless of the form of the company, provided that the principle of limited liability applies to them. Which companies will be discussed in a specific sense depends on each national law individually, ie on its knowledge of different forms of companies, and it can include limited liability companies, joint stock companies (open and closed), limited partners of limited partnership, partnerships with limited liability, etc. However, the experience of case law shows that this institute is mostly used in the form of closed companies (Glynn, 2004), especially those with a smaller number of members, in contrast to open companies where its application is essentially reduced to companies with fewer shareholders (Esterbrook, Fishel, 1985). In this regard, the presence of the „piercing the corporate veil“ institute is most common in one-member companies (Cohn, Simitis, 1963) or companies with a smaller number of members and in fact the institute is absent in public corporations with a large number of shareholders (Renno, 2014). Common to all these companies is that their members act unscrupulously, to the extent that they intentionally use fraudulent acts, thus directly violating the basis of the principle of limited liability that requires their conscientious conduct (Sedillo Lopez, 1982).

## 2. RESEARCH RESULTS AND DISCUSSION

### 2.1. „Piercing the Corporate Veil“ from the Aspect of Company Law

The „piercing the corporate veil“ institute is a special institute of company law. The intention of the legislator in introducing the institute in question in our legislation is primarily motivated by the desire to jeopardize the “sovereignty” of the standard of limited liability of members of the company for the obligations of the limited company, so that they, thanks to the strength of the authority of the law, because of their own non-compliance with that standard and the autonomy of their company as a separate legal entity, be brought to „justice of unlimited liability“ for their company’s obligations to creditors of their company, which provides increased security for creditors and additional sanctions for members of limited company. In this way, a specific legal relationship is established *ipso iure*<sup>4</sup> between persons who are not in a legal relationship (no legal transaction in favor or at the expense of a third party that is otherwise legally possible) and who are third parties - a company member and a creditor, without expression of will of participants in this relationship, as well as without expressing the will of the company itself (Vasiljevic, 2020). Therefore, the intention of the legislator in the countries that have legalized this institute, as well as the practice in the countries that have not done so, is manifested in the desire to sanction members of limited companies for unscrupulous behavior towards their company or for abusing the principle of limited liability for obligations towards the company since in this way the autonomy and sovereignty of the legal subjectivity of the company and its property is endangered. On this basis, the law or practice constitutes the „piercing the corporate veil“ institute, where the term breaking through has a dual function: first a member of the company unjustifiably “enters into a ban on the company as a legal entity and its property”, and then as a result „enters into a ban on a member of the company as a legal entity or a natural person and its property” in order to collect his claim from his contractual partner (Vasiljevic, 2020).

4 In the Roman legal tradition, the term *ipso iure* means an act by which a certain legal relationship, ie right and obligation, arises, changes or ceases directly by law or other legal regulation, without any need to pass a special legal act or take special legal action.

prava, koji kroz svoje pravne mehanizme mogu ostvariti isti efekat kao i kompanijskopravni institut probijanja pravne ličnosti. Međutim, odnos između različitih grana prava vrlo često je zasnovan na nepovjerenju u spremnost i sposobnost druge pravne oblasti da svojim institutima i aktivnostima uspješno ostvari zajedničke pravne ciljeve. U konkretnom slučaju, tačno je da kompanijsko pravo vrlo često zaboravlja na nepobitnu činjenicu da privredna društva kao srž njegovog istraživanja imaju mješovitu pravnu prirodu, u kojoj, između ostalog, dolaze do izražaja i elementi ugovornog i deliktne prava. Upravo je ugovorna priroda privrednih društava imala ključnu ulogu u nametanju pitanja o nužnosti potrebe postojanja ove kompanijskopravne ustanove. S tim u vezi, kontroverznost instituta probijanja pravne ličnosti manje bi došla do izražaja da kompanijsko pravo nije zanemarilo svoju ugovornu prirodu i svoj dug po tom osnovu nesporno nekontroverznom ustanovama ugovornog i deliktne prava (delikt, neosnovano obogaćenje, prevara, zabluda o ličnosti – *alter ego*), kao i stoljetnim pravnim standardima, poput standarda zloupotrebe prava i načela poštenja i savjesnosti (Vasiljević, 2020). Prema tome, ukoliko analiziramo predmetni institut uz pomoć pravnih mehanizama ugovornog i deliktne prava, zaista dolazimo do dvoumljenja da li ustanovu probijanja pravne ličnosti treba izuzeti iz kompanijskopravne oblasti i time neaktuelizirati potrebu za određivanjem njene pravne prirode. Međutim, budući da je neupitna potreba postojanja ovog instituta u sferi stečajnog prava (iako značajno modifikovanog i potpomognutog drugim pravnim institutima sa istom ciljnom funkcijom – *actio pauliana*<sup>5</sup>), a kako postoji zona „ničije zemlje“ između kompanijskog i stečajnog prava, to se ipak čini da treba dati pozitivan odgovor na postavljeno pitanje, s tim što je njegov domašaj značajno ograničen pravnom osnovanošću primjene navedenih instituta ugovornog i deliktne prava, kao i navedenih pravnih standarda (Vasiljević, 2020). Kao rezultat toga, ostaje potreba za određivanjem pravne prirode predmetne ustanove.

S tim u vezi, da bismo razjasnili pitanje pravne prirode ustanove probijanja pravne ličnosti, prvo moramo pojasniti da li je dužnost lojalnosti člana društva prema svom društvu osnova za primjenu ustanove probijanja pravne ličnosti ili alternativa za taj institut. Budući da je kompanijskopravna dužnost lojalnosti internog tipa (dužnost člana društva prema kompaniji), a ne eksternog (dužnost člana društva prema povjericima kao trećim licima), smatramo da ne postoji opravdan razlog da se probijanje pravne ličnosti svede isključivo na ovu osnovu. Međutim, ne treba zanemariti niti ignorisati specifičnost ove ustanove kompanijskog prava koja je sadržana u činjenici da se zakonodavac služi autoritetom zakona sa ciljem formiranja svojevrsnog pravnog odnosa između člana društva i povjerioca društva, bez obzira na to što je riječ o međusobnom odnosu trećih lica.

Pravna teorija nema intenciju da ovaj odnos podvede pod kompanijskopravnu obavezu lojalnosti člana prema svom društvu u slučaju sukoba ličnog interesa ili interesa povezanog lica sa interesom društva, ali ne pokušava da elaboriše zbog čega se isključivo kod instituta probijanja pravne ličnosti zakonodavac odlučio da uspostavi odnos član društva – povjerilac društva. Naime, čini se da je ovdje prisutna fiducijarna dužnost<sup>6</sup> lojalnosti člana društva prema

svojim povjericima, posebno uzimajući u obzir mehanizme zaštite koji povjericima stoje na raspolaganju ukoliko dođe do probijanja pravne ličnosti. U vezi s tim, povjericima je ostavljena zakonska mogućnost naplate potraživanja ne samo od svog dužnika (društva kapitala), već direktno i od člana društva. Između ostalog, ukoliko se želi sačuvati apsolutnost principa ograničene odgovornosti na način da ostane „neprobojan“, neophodno je povećati prag obaveze lojalnosti člana društva kapitala. Pretpostavimo li, s druge strane, da dužnost lojalnosti članova društva ne postoji prema povjericima društva (izuzetak predstavlja kontekst kada se povjerioci posmatraju kao „interes kompanije“), onda se ni ustanova probijanja pravne ličnosti ne bi mogla zasnivati na povredi dužnosti koja i ne postoji prema tom aktivno legitimisanom licu u odnosu na kompaniju po pomenutom osnovu, te ne bi postojala direktna mogućnost naplate potraživanja povjerilaca društva od člana društva, a ona nesporno postoji (Vasiljević, 2020). Pritom, odgovornost po osnovu dužnosti lojalnosti člana društva prema svom društvu je interna, dok je prema povjericima društva eksterna.

Ovakvim određenjem pravne prirode instituta probijanja pravne ličnosti donekle se opravdava njegova svrha i potreba postojanja u kompanijskom pravu, ali se u suštini svodi na kategoriju „izuzetak izuzetka“, budući da prava povjerilaca na taj način nisu ugrožena, imajući u vidu da se u najvećem dijelu kauza ovog instituta postiže preko deliktne odgovornosti člana društva, ali i preko odgovarajućih instituta ugovornog prava i opštih pravnih standarda. Osim toga, dodatni sloj zaštite za povjerioce jeste interna odgovornost kontrolnih članova društva za povredu dužnosti lojalnosti kompaniji, čime se eliminišu neadekvatne kapitalizacije kompanije i povrede principa održanja osnovnog kapitala (Vasiljević, 2020). Uz to, povjerioci bitrebalo da imaju proceduralna sredstva poput derivativne tužbe<sup>7</sup> kojom bi ostvarivali potraživanja društva protiv svojih članova (i članova organa društva) za štetu koju oni prouzrokuju društvu, a što bi u svojoj ukupnosti moglo da bude značajna brana za stečaj kompanije (Singhof, 1999).

## 2.2. Aktivna legitimacija kod instituta probijanja pravne ličnosti

Domet i značaj instituta probijanja pravne ličnosti i principa ograničene odgovornosti članova društva umnogome zavisi od vrste povjerilaca na koje djeluje. U tom smislu potrebno je praviti razgraničenje između statusa ugovornih (voljnih) povjerilaca i neugovornih (nevoljnih, deliktne) povjerilaca. Iako se u sudskoj praksi zahtijeva dokazivanje postojanja osnova primjene instituta probijanja pravne ličnosti kroz sprovođenje identičnih testova nelegitimnog korišćenja principa ograničene odgovornosti, ipak se pravi diskrepanca u ispunjenju standarda za ugovorne povjerioce sa jedne strane, i deliktne povjerioce i radnike angažovane ugovorom o radu s druge strane. S tim u vezi, pravilo je da se za ugovorne povjerioce zahtijeva zadovoljavanje strožih standarda nego za deliktne povjerioce i zaposlene, što čini daleko vjerovatnijom primjenu ustanove probijanja pravne ličnosti i zanemarivanje principa ograničene odgovornosti kod ove druge kategorije povjerilaca (Peterson, 2018).

Varijacije u pristupu zaštite interesa različitih vrsta povjerilaca su, prije svega, u domenu pravne politike i poštenja, a u svakom slučaju

<sup>5</sup> *Actio pauliana* predstavlja tužbu (ili prigovor) kojom se pobijaju dužnikove pravne radnje učinjene na štetu povjerilaca, odnosno pobijaju se pravne radnje dužnika kojima se umanjuje njegova imovina, a sve u cilju onemogućavanja povjerilaca da od njega naplate svoja potraživanja.

<sup>6</sup> U redovnim okolnostima, fiducijarna dužnost predstavlja dužnost lojalnosti i dužnost pažnje kao zakonske dužnosti člana društva prema kompaniji na osnovu odgovarajućeg pravnog odnosa.

<sup>7</sup> Derivativna tužba predstavlja tužbu koju komanditori komanditnog društva, članovi društva sa ograničenom odgovornošću ili akcionari akcionarskog društva imaju pravo da podnesu u svoje ime, a za račun društva protiv ortaka ortačkog društva i komplementara komanditnog društva, lica koja se u skladu sa ovim zakonom smatraju kontrolnim članovima društva sa ograničenom odgovornošću ili kontrolnim akcionarima akcionarskog društva, zastupnika društva, članova upravnog odbora, članova izvršnog odbora, članova odbora za reviziju i internog revizora društva sa ograničenom odgovornošću i akcionarskog društva, lica koja imaju ugovorna ovlaštenja da upravljaju poslovima privrednog društva i likvidacionog upravnika privrednog društva, radi naknade štete prouzrokovane privrednom društvu od tih lica povredom dužnosti koje imaju prema društvu u skladu sa Zakonom o privrednim društvima Republike Srpske.

However, the need for the “piercing the corporate veil” institute is often questioned. The basic drivers that make the existence of the institute in question questionable can be found in the sphere of tort and contract law, which through their legal mechanisms can achieve the same effect as the company law institute of “piercing the corporate veil”. However, the relationship between different branches of law is very often based on distrust in the readiness and ability of another legal field to successfully achieve common legal goals through its institutes and activities. In this particular case, it is true that company law very often forgets the indisputable fact that companies, as the core of his research, have a mixed legal nature, in which, among other things, elements of contract and tort law come to the fore. It was the contractual nature of companies that played a key role in imposing the question of the necessity of the existence of this company law institute. In this regard, the controversy of the “piercing the corporate veil” institute would be less pronounced if the company law did not neglect its contractual nature and its debt on that basis indisputably non-controversial institutes of contract and tort law (tort, unjust enrichment, fraud, delusion of personality - alter ego), as well as centuries-old legal standards, such as the standard of abuse of rights and the principles of honesty and conscientiousness (Vasiljevic, 2020). Therefore, if we analyze the institute in question with the help of legal mechanisms of contract and tort law, we really come to doubt whether the “piercing the corporate veil” institute should be excluded from the field of company law and thus not aucterize the need to determine its legal nature. However, since there is an unquestionable need for the existence of this institute in the field of bankruptcy law (although significantly modified and supported by other legal institutes with the same target function – *actio pauliana*<sup>5</sup>), and as there is a zone of “no man’s land” between company and bankruptcy law, it seems that a positive answer should be given to the question, but its scope is significantly limited by the legal basis of the application of these institutes of contract and tort law and legal standards. (Vasiljevic, 2020). As a result, there remains a need to determine the legal nature of the institute in question.

In this regard, in order to clarify the question of the legal nature of the „piercing the corporate veil“ institute, we must first clarify whether the duty of loyalty of a member of the company to its company is the basis for applying the „piercing the corporate veil“ institute or an alternative to that institute? Since the company law duty of loyalty is an internal type (the duty of a company member towards the company), and not an external one (the duty of a company member towards creditors as third parties), we believe that there is no justifiable reason to reduce the „piercing the corporate veil“ institute solely on this basis. However, one should not ignore or ignore the specificity of this institute of company law, which is contained in the fact that the legislator uses the authority of law to form a kind of legal relationship between a company member and a creditor, regardless of the relationship between third parties.

Legal theory does not intend to bring this relationship under the company law obligation of loyalty of the member to his company in case of conflict of personal interest or the interest of a related person with the interests of the company, but it does not try to

elaborate why exclusively at the „piercing the corporate veil“ institute, the legislator decided to establish a relationship between a member of the company and the creditor of the company. Namely, it seems that the fiduciary duty of loyalty of a company member to his creditors is present here<sup>6</sup> especially taking into account the protection mechanisms that are available to creditors in the event of a „piercing the corporate veil“. In this regard, creditors are left with the legal possibility of collecting receivables not only from their debtor (limited company), but also directly from a member of the company. Among other things, if the absolute principle of limited liability is to be preserved in such a way as to remain “unpierced”, it is necessary to increase the threshold of the loyalty obligation of a member of a limited company. If we assume, on the other hand, that the duty of loyalty of members of the company does not exist towards the creditors of the company (the exception is the context when creditors are seen as “company interest”), then the „piercing the corporate veil“ institute could not be based on a breach of duty that does not exist towards that actively legitimized person in relation to the company on the mentioned basis, and there would be no direct possibility of collecting creditors’ claims from a company member, and it undoubtedly exists (Vasiljevic, 2020). At the same time, the liability based on the duty of loyalty of a company member towards his company is internal, while towards the creditors of the company is external.

This determination of the legal nature of the “piercing the corporate veil” institute to some extent justifies its purpose and need for existence in company law, but in essence it comes down to the category of “exception exception”, since the rights of creditors are not endangered bearing in mind that in most cases the cause of this institute is achieved through the tort liability of a member of the company, but also through the appropriate institutes of contract law and general legal standards. In addition, an additional layer of protection for creditors is the internal liability of the company’s controlling members for violating the company’s loyalty duty, which eliminates inadequate capitalization of the company and violation of the principle of maintaining share capital (Vasiljevic, 2020). In addition, creditors should have procedural means such as a derivative lawsuit<sup>7</sup> to enforce the company’s claims against its members (and members of the company’s bodies) for the damage they cause to the company, which in its entirety could be a significant barrier to company bankruptcy (Singhof, 1999).

## 2.2. Active Legitimacy of the „Piercing the Corporate Veil“ Institute

The scope and importance of the „piercing the corporate veil“ institute and the principle of limited liability of members of the company largely depends on the type of creditors it acts on. In this sense, it is necessary to distinguish between the status of contractual (voluntary) creditors and non-contractual (involuntary, tort) creditors. Although, in case law, it is required to prove the existence of the basis for the application of the „piercing the corporate veil“ institute by conducting identical tests of illegitimate use of the principle of limited liability, there is still discrepancy in meeting the standards for contractual creditors on the one hand, and both tort creditors and workers hired on the basis of employment contracts, on the

<sup>5</sup> *Actio pauliana* is a lawsuit (or objection) that refutes the debtor’s legal actions taken to the detriment of creditors, ie refutes the debtor’s legal actions that reduce his property, all in order to prevent creditors from collecting their claims from him.

<sup>6</sup> In regular circumstances, a fiduciary duty is a duty of loyalty and a duty of care as a legal duty of a member of company towards the company on the basis of an appropriate legal relationship.

<sup>7</sup> Derivative lawsuit is a lawsuit that limited partners of limited partnership, members of a limited liability company or shareholders of a joint stock company have the right to file in their own name and on behalf of the company against partners of the partnership and general partners, persons who are considered controlling members, limited liability company or controlling shareholders of the joint stock company, representatives of the company, members of the board of directors, members of the executive board, members of the audit board and internal auditor of the limited liability company and joint stock company, persons with contractual powers to manage the company and liquidation trustee, for the purpose of compensating the damage caused to the company by mentioned persons who violated the duties they have towards the company in accordance with Company Law of Republic of Srpska.

nalažu uzimanje svih okolnosti u obzir (zaštita u vrijeme kad je društvo solventno ili kad je pred bankrotom), balansiranje interesa različitih klasa povjerilaca, ujednačavanje odnosa troškova i koristi, balansiranje interesa povjerilaca i članova društva, balansiranje vrijednosti različitih subjekata odgovornosti i međusobnog međuuticaja različitih osnova odgovornosti, usaglašavanje vrijednosti pravila i standarda i slično (Mulbert, 2006).

Interesantno je da, u principu, institut probijanja pravne ličnosti nema svog posebnog opravdanja kod povjerilaca koji svojom voljom i iz sopstvenog interesa stupaju u ugovorni odnos sa društvom kapitala (potencijalnim dužnikom). U skladu sa tim, oni preuzimaju poslovni rizik eventualnog neizvršenja takvog ugovora od nesolidnog dužnika, s tim da već u trenutku ugovaranja nastoje da se osiguraju u mjeri u kojoj je to moguće zavisno od konkretnog slučaja. Sljedeće mjere obezbjeđenja se najčešće pojavljuju u praksi: izbor solventnog ugovornog partnera, lična i stvarna sredstva obezbjeđenja ugovora, ugovorne sankcije neispunjenja ugovora, zakonska odgovornost članova organa društva kapitala itd. Ipak, obezbjeđenje ugovora na ovaj način usložnjava njegovu sadržinu, što vrlo često ima odvratajući efekat na ugovorne strane te rezultira njihovim izbjegavanjem da zaključe takve ugovore. Iz tih razloga, pomenuta sredstva obezbjeđenja uglavnom se ne preciziraju u samim ugovorima, što opravdava potrebu postojanja instituta probijanja pravne ličnosti i konstituiše ga kao „rezervnu zaštitu“ za ugovorne povjerioce, s tim da se naglašava jedan njen nedostatak oličen u pravnoj nesigurnosti za investitore. Do pomenute pravne nesigurnosti dolazi zbog mogućih osnova koji uzrokuju aktuelizaciju instituta probijanja pravne ličnosti, među kojima su najsporniji oni vezani za pravičnost ili „neprikladno ponašanje“, kao i primjenu pravila isključivo na „aktivne“ članove društva koji su involvirani u upravljanje društvom, a ne i na „pasivne“, bez obzira na nepobitnu činjenicu da se pravilo generalno odnosi na sve članove društva kapitala, što posljedično stvara odbojni efekat na potencijalne investicije.

Drugačija situacija je kod povjerilaca koji ne stupaju svojom voljom u pravni odnos sa društvom kapitala, već taj odnos nastaje određenim deliktom društva ili zaposlenih (i članova organa društva: odgovornost proizvođača proizvoda ili vršioca usluga trećim licima ili odgovornost za delikte zaposlenih prema trećim licima), te postavlja pitanje naknade prouzrokovane štete, posebno u slučaju insolventnosti dužnika štete, nedovoljne kapitalizacije društva kapitala, kao i nepostojanja odgovornosti članova organa društva u skladu sa pravilima vanugovorne odgovornosti (Anderson, 2009). I razne ekonomske analize pokazuju da svođenje ove odgovornosti isključivo na odgovornost društva kapitala prema trećim licima vodi povećanju troškova, što za posljedicu ima povećanje cijene proizvoda ili cijene vršenja usluga, čime se naglašava važnost odgovornosti članova tog društva kapitala. Princip ograničene odgovornosti koji štiti interese članova društva kapitala kada je riječ o neugovornim povjeriocima, u balansiranju interesa jednih i drugih, sa probijanjem pravne ličnosti kao izuzetkom, ipak je načelno upitan, posebno imajući u vidu da prilikom ujednačavanja interesa ugovornih i neugovornih povjerilaca u postupku bankrota, ugovorni povjerioci (posebno obezbijeđeni) imaju prednost u odnosu na neugovorne koji su redovno neobezbijeđeni povjerioci, što još više problematizuje i princip ograničene odgovornosti članova društva kapitala u pogledu ovih povjerilaca, a sve naglašeno u kontekstu tako lošeg tretmana u postupku bankrotstva (Vasiljević, 2020).

Pitanje pravnog tretmana zaposlenih kao povjerilaca po osnovu odgovornosti društva kapitala predstavlja zasebnu cijelinu, posebno

jer se u pravnom smislu radi o ugovornom odnosu (potraživanja po osnovu ugovora o radu). Izuzetak su situacije kada je riječ o potraživanju po osnovu delikta, budući da tada pravni odnos nastaje kasnije, što ima za posljedicu nemogućnost pregovora i nepostojanje načina da se izvršilac delikta predvidi. Međutim, čak i u slučaju kad je osnov potraživanja ugovor, zbog izuzetne osjetljivosti položaja radnika i faktičke pozicije slabije ugovorne strane, po pravilu se i tada primjenjuju pravila o potrebi zaštite kao da je u pitanju potraživanje po osnovu delikta, što dodatno stvara prostor za primjenu instituta probijanja pravne ličnosti.

U kompanijskom pravu, redovno pravno sredstvo kojima se povjerioci društva služe da objelodane svoj osuđujući zahtjev prema članu društva kapitala i ostvare svoja prava po osnovu ustanove probijanja pravne ličnosti jeste kondemnatorna tužba. Međutim, da bi se ispunile pretpostavke za odgovornost člana prema povjeriocu društva kapitala, potrebno je da povjerilac prvo dokaže postojanje pretpostavki za odgovornost člana društva primjenom ustanove probijanja pravne ličnosti, što za posljedicu ima da se, u procesnom smislu, utvrđivanje pretpostavki za odgovornost članova društva kapitala javlja kao prethodno pitanje. Postavljanje ovako visokog dokaznog praga za tužioca (povjerioca), koji ne raspolaže dokaznom dokumentacijom (naprotiv, ona se nalazi u posjedu društva dužnika ili člana društva), predstavlja neopravdano rješenje koje iz očiglednih razloga nalaže da se što prije promijeni, te da se pomenuta modifikacija, uz poštovanje principa pravičnosti, ogleda u dovoljnosti dokaza *prima facie*<sup>8</sup>, a da se nakon toga dokazni teret prebaci na tuženog člana društva kapitala. Osim tužbe, čini se da bi bila moguća i kompenzaciona protivtužba (ako je član društva po osnovu svog poslovnog odnosa sa povjeriocem društva podnio tužbu protiv njega), dok prigovor proboja potraživanja, kao procesno sredstvo, ne bi bio moguć zbog izostanka uslova uzajamnosti potraživanja između povjerioca društva i člana društva (Vasiljević, 2020).

### 2.3. Pasivna legitimacija kod ustanove probijanja pravne ličnosti

Kada je riječ o pasivnoj legitimaciji, postavlja se opravdano pitanje da li je namjera zakonodavca prilikom formiranja instituta probijanja pravne ličnosti bila da ustanovi podjednaku odgovornost za sve članove društva. Na prvi pogled, čini se da se zakonodavac upravo vodio principom ravnopravnog tretmana svih članova društva kapitala. Međutim, ukoliko se predmetni institut uporedi sa institutom propisanih dužnosti prema društvu, onda bi takva odgovornost obuhvatala samo kontrolne članove. Ako se pak zakonom urede obaveze prema društvu (dužnost lojalnosti, dužnost pažnje), a ne dužnosti članova društva kapitala prema povjeriocima društva, onda probijanje pravne ličnosti kao pravo povjerilaca društva kapitala po osnovu odgovornosti članova društva ne može direktno proizlaziti iz povrede njihovih dužnosti prema društvu, a imajući u vidu da povjerioci ne ostvaruju svoja prava derivativno, dovodi do zaključka da je pravo povjerilaca kao konstitutivnih elemenata društva kapitala samo indirektno zasnovano na povredi dužnosti prema društvu, a izvorno potraživanje po osnovu pravila probijanja pravne ličnosti je originalno i na samom zakonu utemeljeno potraživanje, pod uslovom da ovo pravo povjerioci društva ostvaruju u svoje ime i za svoj račun (Vasiljević, 2020).

Ukoliko se odgovornost za probijanje pravne ličnosti veže za kontrolne članove društva, imajući u vidu da oni imaju propisane dužnosti isključivo prema društvu kao pravnom subjektu, a ne i prema članovima koji nisu kontrolni (izuzetak je individualna tužba)

<sup>8</sup> U pravnom smislu, dokaz *prima facie* označava dokaz koji je, ukoliko se ne ospori, sam po sebi dovoljan odnosno očigledan da dokaže nečiji stav ili tvrdnju. Drugim riječima, to je dokaz pomoću koga se do saznanja pravno relevantne činjenice dolazi logičkim zaključivanjem o uzročno-posljedičnoj vezi na osnovu pravila životnog iskustva.



other hand. In this regard, the rule is that contractual creditors are required to meet stricter standards than tort creditors and employees, which makes it far more likely to apply the „piercing the corporate veil“ institute and disregard the principle of limited liability in this second category of creditors (Peterson, 2018).

Variations in the approach to protecting the interests of different types of creditors are primarily in the field of legal policy and honesty, and in any case require taking into account all circumstances (protection at a time when the company is solvent or on the verge of bankruptcy), balancing the interests of different classes of creditors. costs and benefits, balancing the interests of creditors and members of company, balancing the values of different subjects of liability and the mutual interaction of different bases of liability, harmonizing the values of rules and standards and the like (Mulbert, 2006).

It is interesting that, in principle, the “piercing the corporate veil” institute does not have its special justification for creditors who voluntarily and out of their own interest enter into a contractual relationship with a limited company (potential debtor). Accordingly, they assume the business risk of possible non-performance of such a contract from an unsound debtor, provided that at the time of contracting they seek to insure themselves to the extent possible depending on the specific case. The following security measures most often appear in practice: selection of a solvent contractual partner, personal and actual means of securing the contract, contractual sanctions for non-fulfillment of the contract, legal liability of members of the limited company, etc. However, securing a contract in this way complicates its content, which very often has a deterrent effect on the contracting parties and results in their avoidance of concluding such contracts. For these reasons, the mentioned collateral is mostly not specified in the contracts themselves, which justifies the need for the “piercing the corporate veil” institute and constitutes it as “reserve protection” for contractual creditors, emphasizing one of its flaws embodied in legal uncertainty for investors. The mentioned legal uncertainty is due to possible basis that cause the actualization of the “piercing the corporate veil” institute, among which the most controversial are those related to fairness or “inappropriate behavior”, as well as the application of rules exclusively to “active” members involved in corporate governance and not to the “passive”, regardless of the undeniable fact that the rule generally applies to all members of the limited company, which consequently creates a repulsive effect on potential investments.

The situation is different with creditors who do not voluntarily enter into a legal relationship with a limited company, but this relationship arises from a certain tort of the company or employees (and members of the company’s bodies: liability of product manufacturers or service providers to third parties or liability for employee offenses against third parties) and raises the issue of compensation for damages, especially in the case of insolvency of the debtor, insufficient capitalization of the limited company, as well as the lack of liability of members of the company’s bodies in accordance with the rules of non-contractual liability (Anderson, 2009). Various economic analyzes show that reducing this liability solely to the liability of a limited company towards third parties leads to an increase in costs, which results in an increase in the price of products or prices for services, emphasizing the importance of liability of members of that limited company. The principle of limited liability that protects the interests of members of the limited company when it comes to non-contractual creditors, in balancing the interests of both, with the „piercing the corporate veil“ as an

exception, is still questionable, especially bearing in mind that in balancing the interests of contractual and non-contractual creditors, contractual creditors (especially secured) have an advantage over non-contractual ones who are regularly unsecured creditors, which further problematizes the principle of limited liability of limited company members in relation to these creditors, all emphasized in the context of such poor treatment in bankruptcy proceedings (Vasiljevic, 2020).

The issue of legal treatment of employees as creditors on the basis of the liability of the limited company represents a separate entity, especially because in the legal sense it is a contractual relationship (claims based on employment contracts). Exceptions are situations when it comes to a claim based on a tort, since the legal relationship arises later, which results in the impossibility of negotiations and the lack of a way to predict the perpetrator of the tort. However, even in the case when the basis of the claim is a contract, due to the extreme sensitivity of the position of the worker and the actual position of the weaker contracting party, as a rule, the rules on the need for protection apply as if it were a tort claim, which additionally creates space for the application of the „piercing the corporate veil“ institute.

In company law, the regular legal remedy used by the company’s creditors to disclose their condemnatory claim against a member of the limited company and exercise their rights on the basis of the “piercing the corporate veil” institute is a condemnation lawsuit. However, in order to meet the preconditions for the liability of a member towards the creditor of a limited company, it is necessary for the creditor to first prove the existence of preconditions for the liability of a member of the company by applying the „piercing the corporate veil“ institute, which in procedural terms, results in the fact that determining the preconditions for the liability of the members of the limited company, arises as a preliminary issue. Setting such a high threshold of evidence for the prosecutor (creditor), who does not have evidence (on the contrary, it is in the possession of the debtor’s company or a member of the company), is an unjustified solution that for obvious reasons requires to change as soon as possible, and that the mentioned modification, while respecting the principle of fairness, is reflected in the sufficiency evidence *prima facie*<sup>8</sup>, and after that the burden of proof is transferred to the defendant member of the limited company. In addition to the lawsuit, it seems that a compensatory counterclaim would be possible (if a member of the company filed a lawsuit against him based on his business relationship with the company’s creditor), while the objection of breach of claims as a procedural means would not be possible due to lack of reciprocity of the company’s creditor and member of the company (Vasiljevic, 2020).

### 2.3. Passive Legitimacy of the „Piercing the Corporate Veil“ Institute

When it comes to passive legitimacy, a legitimate question arises as to whether the intention of the legislator when establishing the “piercing the corporate veil” institute was to establish equal liability for all members of company. At first glance, it seems that the legislator was guided by the principle of equal treatment of all members of the limited company. However, if the institute in question is compared to the institute of prescribed duties towards company, then such liability would cover only the controlling members. If, on the other hand, the law regulates the duties towards the company (duty of loyalty, duty of care) and not the duties of the members of the limited company towards the creditors of the company, then the “piercing

<sup>8</sup> In legal terms, *prima facie* evidence means evidence that, if not disputed, is in itself sufficient or obvious to prove one’s position or claim. In other words, it is the proof by which the legally relevant fact is learned by logical inference about the cause-and-effect relationship based on the rules of life experience.

i koji nisu aktivno legitimisana lica po osnovu probijanja pravne ličnosti, onda bi oni mogli protiv kontrolnih članova koji su povrijedili propisane dužnosti prema društvu podnijeti derivativne tužbe, i to za račun društva, ali i individualne tužbe po osnovu „povrede posebnih dužnosti prema društvu“. Najzad, sve pretpostavke za primjenu ustanove probijanja pravne ličnosti u suštini označavaju i povrede dužnosti lojalnosti kontrolnih članova prema društvu, koje je u svakom slučaju neophodno dokazati ukoliko se namjerava iskoristiti predmetni institut, što bi praktično značilo da u tom režimu i status kontrolnog člana ne bi automatski vodio odgovornosti po osnovu probijanja pravne ličnosti. Na kraju, čak i onda kad se samim zakonima označava mogućnost pasivne legitimacije za sve članove društva (jednak i ravnopravan tretman članova društva), zbog činjenice da se ovaj institut praktično primjenjuje samo kod zatvorenih društava (ponajviše kod jednočlanih društava sa malim brojem članova), ipak se čini da je nemoguće ne pronaći konekciju između instituta probijanja pravne ličnosti i instituta povrede dužnosti kontrolnih članova prema društvu, što u konačnici može dovesti do njihove eventualne odgovornosti po osnovu probijanja pravne ličnosti, što se posebno ilustruje kod grupe društava (odgovornost kontrolnog društva kao člana zavisnog društva, kad su za to ispunjene zakonske pretpostavke). Još preciznije, ovakvoj odgovornosti mogu biti podvrgnuti isključivo aktivni kontrolni članovi društva koji učestvuju u radnjama koje predstavljaju osnov probijanja pravne ličnosti, s tim da se ova odgovornost može proširiti i na one članove koji nemaju poziciju kontrolnih ako u konkretnom slučaju preuzmu neke radnje za koje se osnovano može tvrditi da dovode do probijanja pravne ličnosti.

Kada je u pitanju zakonodavna regulativa, interesantan je izbor riječi koji je iskorišćen Zakonom o privrednim društvima Republike Srpske. Naime, njime se predviđa da komanditor komanditnog društva, kao i članovi društva sa ograničenom odgovornošću i akcionari akcionarskog društva mogu prema trećim licima lično odgovarati za obaveze društva ako zloupotrijebe privredno društvo za nezakonite ili prevarne ciljeve ili ako imovinom privrednog društva raspolažu kao sopstvenom imovinom na način kao da privredno društvo kao pravno lice ne postoji. Ukoliko prethodnu odredbu zakona jezički protumačimo, proizašlo bi da ona obuhvata sve članove društva, bez obzira na visinu njihovog učešća u kapitalu. Ipak, vodeći se gorenavedenim razlozima, te koristeći se ciljnim tumačenjem pomenute norme zakona, ispostavlja se da odgovornost za obaveze društva u smislu instituta probijanja pravne ličnosti obuhvata isključivo kontrolne članove društva, što je i logično, budući da mogućnost zloupotrebe pravila o ograničenoj odgovornosti pretpostavlja korporativnu moć odlučivanja, koja je kao pravo rezervisana jedino za takve vrste članova društva. Prema tome, ukoliko uzmemo u obzir da je, po pravilu, kontrolna korporativna moć zasnovana na učešću u kapitalu, proizlazi da je njeno postojanje direktno uslovljeno postojanjem većinskog učešća u kapitalu. Odgovor na pitanje kada postoji većinsko učešće u kapitalu možemo pronaći u odredbama Zakona o privrednim društvima Republike Srpske, gdje se navodi da kontrolni član društva s ograničenom odgovornošću ili kontrolni akcionar akcionarskog društva u smislu ovog zakona jeste lice koje samo ili sa drugim licima koja sa njim djeluju zajedno ima više od 50% glasačkih prava u privrednom društvu na osnovu običnih akcija. Osim toga, korporativna moć odlučivanja može se postići i kada je procentualno učešće u kapitalu sa pravom glasa ispod zakonskog minimuma (dispersija članova društva, njihov neaktivizam, dozvoljeni ugovori o glasanju itd.), kao i putem tzv. zajedničkog djelovanja sa drugim licima (što su sve činjenice koje se moraju dokazati jer se nijedna od njih ne pretpostavlja).

Ono što ostaje sporno jeste razlog koji je naveo našeg zakonodavca da uvrsti komanditore u pasivno legitimisana lica za odgovornost

po osnovu instituta probijanja pravne ličnosti, imajući u vidu da se radi o licima koja nemaju kontrolnu korporativnu moć, odnosno ne upravljaju društvom niti mogu posjedovati upravljačku kontrolu nad društvom, te time postaju uskraćeni za mogućnost da uopšte zloupotrijebe princip ograničene odgovornosti kao nužne i nezaobilazne pretpostavke za odgovornost člana društva povjericima društva po osnovu probijanja pravne ličnosti. U svakom slučaju, lavirant ustanove probijanja pravne ličnosti u smislu članova društva kao subjekata odgovornosti prema povjericima društva, sa kojim ih zakon na ovaj način prinudno spaja i čini odgovornim, pored odgovornosti društva kao ugovornog partnera, pod pretpostavkom ispunjenosti uslova, ostaje nerazrješiv i pravno neobjašnjiv, osim djelimično sa koncepcijom povjerilaca kao konstitutivnog elementa „interesa društva“, kome članovi društva moraju biti lojalni u slučaju sukoba svog ličnog interesa ili interesa povezanih lica sa „interesom društva“, te da povredom tog interesa povređuju dužnost lojalnosti društvu koja uključuje i povredu dijela te dužnosti prema povjericima (Vasiljević, 2020).

Pravna zasnovanost i osnovanost ovog instituta u kompanijskom pravu mogla bi se iskristalisati ukoliko se prizna svojevrsna kompanijskopravna dužnost lojalnosti članova društva svojim povjericima po ovoj ustanovi, čijim kršenjem bi automatski i direktno postajali odgovorni. U praksi je to već i sada slučaj, ali bi u ovom kontekstu imali jasnu pravnu osnovu sa odgovarajućim kompanijskopравnim rješenjem, što bi bilo u saglasnosti sa već postojećim preovladajućim mišljenjem pravne teorije da takva vrsta odgovornosti faktički i postoji. Na ovaj način, članovi društva ne bi izgubili, nego bi naprotiv, pojačali povjerenje povjerilaca njihovih društava, dok bi povjerioci dobili izvjestan suverenitet i u kompanijskom pravu, makar locirano samo na ustanovu probijanja pravne ličnosti, te bi se na taj način postigla ravnoteža interesa, a kompanijsko pravo bi dobilo na svom autoritetu i u odnosu na ugovorno i deliktno pravo, na čijem terenu u kontekstu ove ustanove, za sada gubi (Vasiljević, 2020).

#### 2.4. Priroda odgovornosti kod probijanja pravne ličnosti

Budući da se u slučaju odgovornosti člana društva za obaveze društva prema povjericima društva primjenom ustanove probijanja pravne ličnosti, radi o postojanju ugovornog odnosa društva i trećeg lica, a ne i člana društva, čini se da, ukoliko nema ugovornog aranžmana, ovaj odnos može ipak imati samo neugovornu prirodu. Ovim se ne ukida odgovornost člana društva za obaveze društva prema trećim licima po osnovu ugovora ili delikta i po osnovu sopstvene deliktne odgovornosti, kad u njegovim radnjama prema svojoj kompaniji ima elementa delikta, kao što se ne dovodi u pitanje ni potencijalna odgovornost članova organa društva prema samom društvu, drugim članovima društva, prema povjericima društva, kao i prema trećim licima, kad postoje odgovarajuće zakonske pretpostavke.

U pogledu odgovornosti članova za imovinske obaveze društva prema trećim licima, bitno je istaći da približavanje pravne prirode društava kapitala pravnoj prirodi društava lica korišćenjem ustanove probijanja pravne ličnosti može ići do određene mjere, ali se između njih ne može postaviti znak jednakosti. Naime, kod društava lica odgovaraju svi članovi društva (ortaci) ili samo jedna kategorija članova (komplementari), i to svojom sopstvenom imovinom, za razliku od društava kapitala gdje odgovornost ličnom imovinom nastupa tek ukoliko se utvrdi da je došlo do zloupotrebe pravnog subjektiviteta društva, odnosno do probijanja pravne ličnosti.

Odgovornost članova društva kapitala za obaveze društva prema povjericima društva, primjenom instituta probijanja pravne ličnosti na zakonu je zasnovana (zakonska obaveza), imperativna, akcesorna (po pravilu, zavisna od punovažnosti obaveze sa društvom), direktna, konkretna (odnos konkretnog povjerioca i člana društva

the corporate veil” as the right of creditors of the limited company towards the company, and bearing in mind that creditors do not exercise their rights derivatively, leads to the conclusion that the right of creditors as constitutive elements of the limited company is only indirectly based on breach of duty to the company, and the original claim is, based on the rules of the “piercing the corporate veil”, an original claim based on the law itself, provided that the creditors of the company exercise this right in their own name and for their own account (Vasiljevic, 2020).

If the liability for “piercing the corporate veil” is related to the controlling members of the company, and having in mind that they have prescribed duties exclusively towards the company as a legal entity, and not towards members who are not controlling (exception is an individual lawsuit) and who are not actively based on the “piercing the corporate veil” case, then they could file derivative lawsuits against control members who violated the prescribed duties towards the company on behalf of the company, but also individual lawsuits based on “violation of special duties towards the company”. Finally, all the preconditions for the application of the “piercing the corporate veil” institute essentially mean violations of the duty of loyalty of control members towards the company, which in any case must be proven if the institute is intended to be used, which would practically mean that in that regime, also the status of a controlling member would not automatically lead to liability based on the „piercing the corporate veil“. In the end, even when the laws themselves indicate the possibility of passive legitimacy for all members of company (equal treatment of company members), due to the fact that this institute is practically applied only to closed companies (mostly single-member companies with fewer members), makes it impossible not to find a connection between the „piercing the corporate veil“ institute and the institute of breach of duties of controlling members towards company, which may ultimately lead to their eventual liability based on „piercing the corporate veil“, which is especially illustrated by a group of companies (liability of the controlling company as a member of the subsidiary, when the legal preconditions are met). More precisely, such liability can be subjected only to active control members of the company who participate in actions that are the basis for „piercing the corporate veil“, but this liability can be extended to those members who do not have a position of control if they take some action which can reasonably be claimed to lead to „piercing the corporate veil“.

When it comes to legislative regulations, the choice of words used by the Company Law of the Republic of Srpska is interesting. Namely, it stipulates that a limited partner in a limited partnership, as well as members of a limited liability company and shareholders of a joint stock company may be personally liable to third parties for the company’s obligations if they abuse the company for illegal or fraudulent purposes or if they dispose of the company’s assets as if it were their own, in a way as if the company as a legal entity does not exist. If we interpret the previous provision of the law linguistically, it would turn out that it includes all members of a company, regardless of the amount of their share in the capital. However, guided by the above reasons, and using a targeted interpretation of the said rule of law, it turns out that liability for the obligations of the company in terms of the „piercing the corporate veil“ institute includes only controlling members of the company, which is logical, since the possibility of abusing the limited liability rules presupposes corporate decision-making power, which as a right is reserved only for such types of members of a company. Therefore, if we take into account that, as a rule, the controlling corporate power is based on share in the capital, it follows that its existence is directly conditioned by the existence of majority

share in the capital. The answer to the question of when there is a majority share in the capital can be found in the provisions of the Company Law of Republic of Srpska, which states that the controlling member of a limited liability company or controlling shareholder of a joint stock company in terms of this law is a person who alone or together with other persons has more than 50% of the voting power in the company on the basis of ordinary shares. In addition, corporate decision-making power can be achieved when the percentage share in the capital with voting rights is below the legal minimum (dispersion of company members, their inactivity, allowed voting agreements, etc.), as well as through so-called joint action with others (which are all facts that must be proven because none of them are assumed).

What remains controversial is the reason that led our legislator to include limited partners in passively legitimized persons for liability based on the “piercing the corporate veil” institute, bearing in mind that these are persons who do not have control over corporate power, that is, they do not manage the company nor can they have managerial control over the company, thus becoming deprived of the opportunity to abuse the principle of limited liability as a necessary and unavoidable precondition for the liability of a company member to the company’s creditors on the basis of “piercing the corporate veil”. In any case, the labyrinth of the “piercing the corporate veil” institute in terms of members of the company as subjects of liability to creditors of the company by which the law in this way forcibly unites them and makes them liable, in addition to the company’s responsibility as a contractual partner, assuming the conditions are met, it remains unsolvable and legally inexplicable, except in part with the concept of creditors as a constitutive element of “company’s interests”, to which members of a company must be loyal in case of conflict of personal interest or interests of related parties with “company’s interest”, and that by violating that interest, they violate the duty of loyalty to company, which includes the violation of part of that duty towards creditors (Vasiljevic, 2020). The legal basis and validity of this institute in company law could crystallize if a kind of company law duty of loyalty of company members to their creditors in this institute is recognized, whose violation would automatically and directly make them liable. In practice, this is already the case, but in this context we would have a clear legal basis with an appropriate company law solution, which would be in line with the prevailing opinion of legal theory that this type of liability actually exists. In this way, members of the company would not lose, but on the contrary, strengthen the trust of creditors in their companies, while creditors would gain some sovereignty in company law, even if located only on the „piercing the corporate veil“ institute, and thus achieve a balance of interests and company law would gain in its authority and in relation to contract and tort law, in whose field, in the context of this institute, it loses for now (Vasiljevic, 2020).

#### 2.4. The Nature of Liability of the „Piercing the Corporate Veil“

Since in the case of liability of a member of the company for the obligations of the company to the creditors of the company, applying the „piercing the corporate veil“ institute, it is a contractual relationship between the company and a third party, but not a member of the company, it seems that if there is no contractual arrangement, this relationship can, however, only have a non-contractual nature. This does not eliminate the liability of a member of the company for the company’s obligations to third parties under the contract or tort and on the basis of its own tort liability, when in its actions towards its company there are elements of tort, just as the potential liability of the members of the company’s bodies towards the company itself, other members of the company, towards the

potencijalno odgovornog po ovom osnovu), sa funkcijom dodatne zaštite povjerilaca (Vasiljević, 2020). Ovdje je riječ o odgovornosti za drugog, koja obuhvata cijelokupnu odgovornost društva, što uključuje predugovorne, ugovorne i vanugovorne obaveze, budući da se ipak ne pravi razlika u pogledu načina nastanka obaveze za angažovanje odgovornosti člana društva u kontekstu ove ustanove. Autonomna i zakonska odgovornost za tuđe obaveze predstavlja odgovornost *in abstracto*, a ne odgovornost *in concreto*, i riječ je o blanko odgovornosti za sve buduće obaveze (Vasiljević, 2020). Zbog toga je potrebno ovu odgovornost razlikovati od fakultativne odgovornosti *in concreto* za obaveze drugog (ugovor o jemstvu, ugovor o garanciji i sl.), posebno iz razloga što se kod ustanove probijanja pravne ličnosti radi o obaveznoj odgovornosti, čije se pravno utemeljenje može pronaći u samom zakonu.

Postoje različite vrste odgovornosti za drugoga, od solidarne i supsidijarne do ograničene i neograničene, te je potrebno utvrditi o kojoj vrsti i obimu odgovornosti je riječ kod ustanove probijanja pravne ličnosti. Za razliku od Zakona o privrednim društvima Republike Srbije, u kojoj ova oblast ostaje prepuštena tumačenju, Zakonom o privrednim društvima Republike Srpske koncizno se navodi da komanditori komanditnog društva, kao i članovi društva sa ograničenom odgovornošću i akcionari akcionarskog društva, odgovaraju solidarno za probijanje pravne ličnosti. Pritom, u Zakonu o privrednim društvima Republike Srpske navodi se da opšti pravni princip ograničene odgovornosti članova društva ne važi u slučaju pomenutih zloupotreba privrednog društva od navedenih lica, što znači da se ujedno radi i o neograničenoj odgovornosti. Imajući u vidu da je u središtu instituta probijanja pravne ličnosti zaštita interesa povjerilaca društva, te uzimajući u obzir da se ta protekcija najbolje ostvaruje kroz solidarnu neograničenu odgovornost članova društva, jasno proizlazi zbog čega se zakonodavac opredijelio za ovakvu vrstu i obim odgovornosti.

Solidarni dužnik koji ispuni obavezu prema povjeriocu „za drugoga“ ima pravo regresa prema ostalim dužnicima, na osnovu pravila kojima se regulišu njihovi interni odnosi, a u njihovom nedostatku, prema pravilima Zakona o obligacionim odnosima. Kod ostvarivanja prava na regres razlikujemo aktivnu i pasivnu legitimaciju. S tim u vezi, pravo na regres (aktivna legitimacija) ima onaj dužnik koji je platio više nego što je po pravilu o regulisanju unutrašnjih odnosa obavezan, dok pasivna legitimacija nastupa onog trenutka kada se regres zahtjeva od onih dužnika za čiji račun je obaveza izvršena. Treba naglasiti da obaveza može biti zaključena u isključivom interesu jednog dužnika, te ukoliko je to slučaj, a dođe do namirenja obaveze od strane sudužnika, postoji obaveza dužnika da istom naknadi cijeli iznos obaveze. Ako to nije slučaj, a ništa drugo nije ugovoreno ili ništa drugačije ne proizlazi iz pravnih odnosa učesnika u poslu, na svakog dužnika otpada podjednak dio obaveze. Prema tome, u unutrašnjim odnosima članova društva nema solidarne odgovornosti, već dolazi do podjele obaveze (Vasiljević, 2020).

## ZAKLJUČAK

Institut probijanja pravne ličnosti osvjetljava sve aspekte problema limita pravne ličnosti. Suština je da princip ograničene odgovornosti članova društva kapitala i dalje ostaje pravilo, što za sobom povlači i odvojenost subjektiviteta tog društva od subjektiviteta vlasnika odnosno člana, a samim time i odvojenost njihove odgovornosti. Međutim, zbog opšteg pravnog principa da se na vlastitom nepravu ne može zasnovati bilo kakvo pravo proizlazi da zloupotreba ograničene odgovornosti članova društva opravdava nastanak izuzetka od tog pravila, koji na temeljima sopstvenog delikta lišava

člana društva njegovog prava na ograničenu odgovornosti i ulazi na teren njegove neograničene odgovornosti. Time se i „probija“ pravni subjektivitet društva, koji je služio kao garant postojanja ograničene odgovornosti člana društva. Ovdje je neophodno istaći da član društva ne može zloupotrijebiti pravni subjektivitet svog društva, budući da on pripada isključivo društvu, već samo pravo koje pripada njemu lično, a to je pravo ograničene odgovornosti. Upravo na taj način, kroz zloupotrebu ograničene odgovornosti, dešava se probijanje subjektiviteta društva za potrebe odgovornosti člana društva povjeriocu društva. Ipak, da bi u potpunosti došlo do izražaja, kompanijsko pravo treba da ustanovu probijanja pravne ličnosti „osvježi“ određenim novinama koje ćemo ovdje navesti.

Za početak, bilo bi poželjno da se Zakonom o privrednim društvima Republike Srpske uvede kompanijskoppravna dužnost člana društva prema povjeriocima društva u kontekstu ustanove probijanja pravne ličnosti, što bi kompanijskoppravnu prirodu ovog instituta učinilo nespornom, a time bi i prestala biti u „sjenci“ ugovornog i deliktog prava. Zatim, potrebno je uspostaviti vezu između upravljačke moći u društvu i zloupotrebe principa ograničene odgovornosti i to na način da se upravljačka moć pojavi kao neophodna pretpostavka da do zloupotrebe ograničene odgovornosti uopšte dođe. Nadalje, potrebno je razjasniti kada tačno postoji osnova za primjenu ove ustanove u određenim slučajevima s pozivom na odgovarajuće građanskopravne institute ukoliko se ispune svi uslovi za njihovu primjenu, a to posebno važi kod deliktne odgovornosti s obzirom na činjenicu da ne postoji ugovorna veza između člana i povjerioca društva. Pored toga, imajući u vidu da je zloupotreba prava ograničene odgovornosti od strane članova društva zasnovana na krivici, poželjno bi bilo kad bi se jasno naznačilo da je riječ o standardu pažnje *in abstracto*, prema kojem zahtijevani prosječni standard pažnje člana društva predstavlja pažnja običnog građanina.

Sumirajući sve navedeno, primjetno je da je opravdanost ovog instituta i dalje upitna, što je i razlog postojanja širokog diverziteta u uporednopravnom pristupu njegove regulative. Osim raznolikosti kod zakonodavnog aspekta, još uvijek postoje neslaganja i u teorijskom smislu vezana za potrebu postojanja ustanove probijanja pravne ličnosti kod solventnih kompanija, koju karakteriše redovnost i konzistentnost u ispunjavanju ugovornih i vanugovornih obaveza, čime se direktno štite ugovorni i vanugovorni povjerioci. U svakom slučaju, nesporno je da je ovaj institut potreban kod kompanija u stečajnom postupku, radi povećanja zaštite i sigurnosti povjerilaca, ali to ujedno ne znači da ne postoji obaveza onih društava kapitala koja se nalaze u vanstečajnoj poziciji da vode računa o zaštiti i interesu povjerilaca, s tim da je, prema dominantnoj kompanijskoppravnoj formuli, uprava društva prevashodno dužna da radi i djeluje u interesu društva, pošto bi u suprotnom, odnosno, u slučaju favorizovanja interesa povjerilaca, činila povredu svojih propisanih dužnosti.

## IZVORI

1. Anderson, H. (2009). Piercing the Veil on Corporate Groups in Australia: The Case for Reform. *Melbourne University Law Review*. 33(2), 348–351.
2. Bainbridge, S. (2005). Abolishing LLC Veil Piercing. *University of Illinois Law Review*. 77(5), 77–106.
3. Cohn, E. J., Simitis, C. (1963). Lifting the Veil in the Company Laws of the European Continent. *International and Comparative Law Quarterly*. 12(1), 189–225.

company's creditors, as well as towards third parties, when there are appropriate legal preconditions, is not questioned.

Regarding the liability of members for the company's property obligations towards third parties, it is important to point out that bringing the legal nature of limited companies closer to the legal nature of partnerships using the „piercing the corporate veil“ institute can go to a certain extent, but no sign of equality can be placed between them. Namely, in the case of partnerships, all members of the company (partners) or only one category of members (general partners) are liable with their personal property, unlike limited companies where liability with personal property occurs only if it is determined that the company's legal personality has been abused that is, until the event of „piercing the corporate veil“ occurs.

The liability of the members of the limited company for the obligations of the company towards the creditors of the company, by applying the „piercing the corporate veil“ institute is based on law (legal obligation), imperative, accessory (usually depending on the validity of the obligation with the company), direct, specific (relationship between a specific creditor and a member of the company potentially liable on this basis), with the function of additional protection of creditors (Vasiljevic, 2020). This is a liability for others, which includes the entire liability of the company, which includes pre-contractual, contractual and non-contractual obligations, since no distinction is made regarding the manner of incurring the obligation to engage the liability of a company member in the context of this institute. Autonomous and legal liability for other people's obligations is liability in abstracto, not liability in concreto, and it is a blank liability for all future obligations (Vasiljevic, 2020). Therefore, it is necessary to distinguish this liability from the optional liability in concreto for the obligations of others (guarantee agreement, etc.), especially because the „piercing the corporate veil“ institute is a mandatory liability, the legal basis of which can be found in the law itself.

There are different types of liability for others, from joint and several and subsidiary to limited and unlimited, and it is necessary to determine the type and scope of liability regarding the „piercing the corporate veil“ institute. Unlike the Company Law of the Republic of Serbia, in which this area remains to be interpreted, the Company Law of the Republic of Srpska concisely states that limited partners in limited partnership, as well as members of limited liability companies and shareholders are jointly and severally liable for „piercing the corporate veil“. At the same time, the Company Law of the Republic of Srpska states that the general legal principle of limited liability of company members does not apply in the case of the mentioned abuses of the company by these persons, which means that it is also unlimited liability. Having in mind that the protection of the interests of the company's creditors is at the center of the „piercing the corporate veil“ institute, and taking into account that this protection is best achieved through joint and several unlimited liability of company members, it is clear why the legislator opted for this type and scope of liability.

A joint and several debtor who fulfills the obligation to the creditor “for others” has the right of recourse against other debtors, based on the rules governing their internal relations, and in their absence, according to the rules of the Law on Contracts and Torts. When exercising the right to recourse, we distinguish between active and passive legitimacy. In this regard, the right to recourse (active legitimacy) has the debtor who has paid more than is required by the rule governing internal relations, while passive legitimacy occurs when recourse is required from those debtors on whose behalf the obligation is performed. It should be emphasized that the obligation can be concluded in the exclusive interest of one debtor, and if this is the case, and there is a settlement of the obligation by the co-

debtor, there is an obligation of the debtor to reimburse the entire amount. If this is not the case, and nothing else has been agreed or nothing else arises from the legal relations of the participants in the transaction, each debtor has an equal part of the obligation. Therefore, there is no solidarity in the internal relations of the members of the company, but there is a separation of obligations (Vasiljevic, 2020).

## CONCLUSION

The „piercing the corporate veil“ institute sheds light on all aspects of the problem of the limit of legal personality. The essence is that the principle of limited liability of members of a limited company remains the rule, which entails the separation of the subjectivity of the company from the subjectivity of the owner or member, and thus the separation of their liabilities. However, due to the general legal principle that no right can be based on one's own non-right, it follows that the abuse of the limited liability of members of company justifies the emergence of an exception to that rule, which, on the basis of its own tort, deprives a member of company of his right to limited liability and enters the field of his unlimited liabilities. This causes the „piercing“ of legal subjectivity of the company, which served as a guarantor of the existence of limited liability of a member of the company. It is necessary to point out here that a member of a company cannot abuse the legal subjectivity of his company, since he belongs exclusively to the company, but only the right that belongs to him personally, and that is the right of limited liability. It is in this way, through the abuse of limited liability, that the subjectivity of the company is „pierced“ for the needs of the liability of a member of the company to the creditor of the company. However, in order to be fully expressed, company law should “refresh” the „piercing the corporate veil“ institute with certain novelties that we will list here.

To begin with, it would be desirable for the Company Law of the Republic of Srpska to introduce the company law duty of a member of the company towards the company's creditors in the context of the „piercing the corporate veil“ institute, which would make the company law nature of this institute indisputable, and thus would cease to be in the “shadow” of contract and tort law. Next, it is necessary to establish a link between the managerial power in a company and the abuse of the principle of limited liability in such a way that the managerial power appears as a necessary prerequisite that there is no abuse of limited liability at all. Furthermore, it is necessary to clarify when exactly there is a basis for the application of this institute in certain cases with reference to the relevant civil law institutes if all conditions for their application are met, especially in tortious liability given the fact that there is no contractual relationship between member and creditors of the company. In addition, given that the abuse of limited liability by members of company is based on guilt, it would be desirable to clearly indicate that this is a standard of due diligence in abstracto, according to which the required average standard of due diligence of a member of company is the due diligence of an ordinary citizen.

Summarizing all the above, it is noticeable that the justification of this institute is still questionable, which is the reason for the existence of a wide diversity in the comparative legal approach of its regulations. Apart from the diversity in the legislative aspect, there are still disagreements in the theoretical sense related to the need for the „piercing the corporate veil“ institute in solvent companies, which is characterized by regularity and consistency in fulfilling its contractual and non-contractual obligations, which

4. Esterbrook, F., Fishel, D. (1985). Limited Liability and the Corporation. *The University of Chicago Law Review*. 52(1), 89–117.
5. Glynn, T. (2004). Beyond Unlimiting Shareholder Liability: Vicarious Tort Liability for Corporate Officers. *Vanderbilt Law Review*. 57(2), 336–343, 361–378.
6. Mulbert, P. (2006). A Synthetic View of Different Concepts of Creditor Protection, or: A High-Level Framework for Corporate Creditor Protection. *EBOR*. 7(1), 357–408.
7. Peterson, C. (2018). Piercing the Corporate Veil by Tort Creditors. *Journal of Business and Technology Law*. 13(1), 63–95.
8. Ramsay, I., Noakes, D. (2001): Piercing the Corporate Veil in Australia. *Company and Securities Law Journal*. 19(4), 250–271.
9. Renno, K. (2014). *Il faut alléguer les faits précis qui permettent la levée du voile corporatif*. <http://www.abondroit.com/2014/11/il-faut-alleguer-les-faits-precis-qui.html>
10. Sedillo Lopez, A. (1982). The Alter Ego Doctrine: Alternative Challenges to the Corporate Form. *UCLA Law Review*. 30(1), 129–155.
11. Singhof, B. (1999). Equity Holders Liability for Limited Liabilities Companies' Unrecoverable Debts – Reflections on Piercing the Corporate Veil under German Law. *Loyola of Los Angeles International and Comparative Law Review*. 22(2), 143–174.
12. Smith, D. (2008). Piercing the Corporate Veil in Regulated Industries. *Brigham Young University Law Review*. 2008(4), 1169–1210.
13. Vaslijević, M. (2020). *Probijanje pravne ličnosti u kompanijskom pravu*. „INTERMEX“ d.o.o., Beograd.
14. Zakon o privrednim društvima Republike Srbije, „Službeni glasnik Republike Srbije“ br. 36/2011, 99/2011, 83/2014 – dr. zakon, 5/2015, 44/2018, 95/2018, 91/2019. i 109/2021.
15. Zakon o privrednim društvima Republike Srpske, „Službeni glasnik Republike Srpske“ br. 127/2008, 58/2009, 100/2011, 67/2013, 100/2017. i 82/2019.
16. Wibberley, J., Guildhall Chambers, Di Giola, M. (2014). *Lifting, Piercing and Sidestepping the Corporate Veil*. [https://www.guildhallchambers.co.uk/uploaded Files/ Piercing the Corporate%20Veil.JW,MDG.pdf](https://www.guildhallchambers.co.uk/uploadedFiles/Piercing%20the%20Veil.JW,MDG.pdf)

directly protects contractual and non-contractual creditors. In any case, it is indisputable that this institute is needed by companies in bankruptcy proceedings to increase the protection and security of creditors, but this does not mean that there is no obligation of those limited companies that are in a non-bankruptcy position to take care of protection and interest of creditors, provided that, according to the dominant company law formula, the company's management is primarily obliged to work and act in the interest of the company, because otherwise, in the case of favoring the interests of creditors, it would violate its prescribed duties.

## LITERATURE

- Anderson, H. (2009). Piercing the Veil on Corporate Groups in Australia: The Case for Reform. *Melbourne University Law Review*. 33(2), 348-351.
- Bainbridge, S. (2005). Abolishing LLC Veil Piercing. *University of Illinois Law Review*. 77(5), 77-106.
- Cohn, E.J., Simitis, C. (1963). Lifting the Veil in the Company Laws of the European Continent. *International and Comparative Law Quarterly*. 12(1), 189-225.
- Esterbrook, F., Fishel, D. (1985). Limited Liability and the Corporation. *The University of Chicago Law Review*. 52(1). 89-117.
- Glynn, T. (2004). Beyond Unlimiting Shareholder Liability: Vicarious Tort Liability for Corporate Officers. *Vanderbilt Law Review*. 57(2), 336-343, 361-378.
- Mulbert, P. (2006). A Synthetic View of Different Concepts of Creditor Protection, or: A High-Level Framework for Corporate Creditor Protection. *EBOR*. 7(1), 357-408.
- Peterson, C. (2018). Piercing the Corporate Veil by Tort Creditors. *Journal of Business and Technology Law*. 13(1), 63-95.
- Ramsay, I., Noakes, D. (2001): Piercing the Corporate Veil in Australia. *Company and Securities Law Journal*. 19(4), 250-271.
- Renno, K. (2014). *Il faut alléguer les faits précis qui permettent la levée du voile corporatif*. <http://www.abondroit.com/2014/11/il-faut-alleguer-les-faits-precis-qui.html>
- Sedillo Lopez, A. (1982). The Alter Ego Doctrine: Alternative Challenges to the Corporate Form. *UCLA Law Review*. 30(1), 129-155.
- Singhof, B. (1999). Equity Holders Liability for Limited Liabilities Companies' Unrecoverable Debts—Reflections on Piercing the Corporate Veil under German Law. *Loyola of Los Angeles International and Comparative Law Review*. 22(2), 143-174.
- Smith, D. (2008). Piercing the Corporate Veil in Regulated Industries. *Brigham Young University Law Review*. 2008(4), 1169-1210.
- Vaslijević, M. (2020). *Probijanje pravne ličnosti u kompanijskom pravu*. „INTERMEX“ d.o.o., Beograd.
- Zakon o privrednim društvima Republike Srbije, („Službeni glasnik Republike Srbije“, br. 36/2011, 99/2011, 83/2014 - dr. zakon, 5/2015, 44/2018, 95/2018, 91/2019 i 109/2021).
- Zakon o privrednim društvima Republike Srpske, „Službeni glasnik Republike Srpske“, br. 127/2008, 58/2009, 100/2011, 67/2013, 100/2017 i 82/2019.
- Wibberley, J., Guildhall Chambers, Di Giola, M. (2014). *Lifting, Piercing and Sidestepping the Corporate Veil*. [https://www.guildhallchambers.co.uk/uploadedFiles/Piercing the Corporate%20Veil.JW,MDG.pdf](https://www.guildhallchambers.co.uk/uploadedFiles/Piercing%20the%20Veil.JW,MDG.pdf)





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# Uticaj pandemije COVID-19 na ekonomski rast privrede Republike Srpske

## The impact of the COVID-19 pandemic on the economic growth of the Republic of Srpska economy

### Rezime

U 2020. godini, kao posljedica globalne pandemije, Republiku Srpsku zadesila je najveća recesija u posljednjih 25 godina, i pad realne stope BDP-a za 2,8%. Osnovne manifestacije takve krize jesu pad potrošnje, investicija i potražnje iz inostranstva. Uzimajući u obzir podatke iz četvrtog kvartala 2020. godine i prva četiri mjeseca 2021. godine, ekonomija Republike Srpske ipak pokazuje značajan oporavak. U prva četiri mjeseca 2021. godine, izvoz robe imao je značajan rast od čak 24,9%, a uvoz robe imao je nominalni rast od oko 15%. Pokrivenost izvoza uvozom iznosila je 81,9%. U navedenom periodu prosječna stopa rasta industrijske proizvodnje iznosila je 14,3%. U Republici Srpskoj do kraja godine najavljen je investicioni ciklus vrijedan nekoliko milijardi KM. Kao osnovni rizici za dalji oporavak nameću se neizvjesnost u pogledu intenziteta i trajanja pandemije izazvane virusom korona (COVID-19), prekid u lancima proizvodnje i snabdijevanja, pad globalne ekonomske aktivnosti i pooštavanje uslova na međunarodnim finansijskim tržištima te odliv kapitala iz zemalja u razvoju.

Cilj istraživanja jeste spoznaja o uticaju pandemije na ekonomski rast Republike Srpske i prognoze za oporavak privrede. U istraživanju su korišćene metode analize, sinteze, komparacije te deduktivna metoda.

**Ključne reči:** COVID-19, ekonomski rast, Republika Srpska

### Abstract

In 2020, as a consequence of the global pandemic, the Republic of Srpska was hit by the biggest recession in the last 25 years, and the real GDP rate fell by 2.8%. The main manifestations of such a crisis are the decline in consumption, investment and demand from abroad. Taking into account the data from the fourth quarter of 2020 and the first four months of 2021, the economy of Republika Srpska is still showing a significant recovery. In the first four months of 2021, exports of goods had a significant growth of as much as 24.9%, and imports of goods had a nominal growth of about 15%. The coverage of exports by imports amounted to 81.9%. In the mentioned period, the average growth rate of industrial production was 14.3%. An investment cycle worth several billion BAM has been announced in Republika Srpska by the end of the year. The main risks to further recovery are uncertainty about the intensity and duration of the coronavirus pandemic (COVID-19), disruption of production and supply chains, declining global economic activity and tightening conditions in international financial markets, and capital outflows from developing countries.

The aim of the research is to find out about the impact of the pandemic on the economic growth of the Republic of Srpska and the forecast for economic recovery. The following scientific research methods were used in the research: deductive method, method of analysis, method of synthesis and method of comparison.

**Keywords:** COVID-19, economic growth, Republic of Srpska

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## UVOD

Republiku Srpsku zadesila je najveća ekonomska i zdravstvena kriza u posljednjih 25 godina. Kriza prouzrokovana pandemijom COVID-19 je globalnog opsega. Zemlje koje su naši najznačajniji spoljnotrgovinski partneri pogođene su značajnom recesijom prouzrokovanom pandemijom. Međutim, treba naglasiti da su od zemalja koje su naši najznačajniji spoljnotrgovinski partneri, Srbija i Slovenija u prvom kvartalu 2021. godine ostvarile pozitivan privredni rast.

U Republici Srpskoj bruto domaći proizvod (BDP) u prvom kvartalu 2020. godine bio je pozitivan, da bi zatim uslijedio nagli pad, posebno u drugom kvartalu, i taj trend pada BDP-a nastavljen je i do kraja godine, s tim da je u četvrtom kvartalu pad BDP-a bio znatno manji u odnosu na drugi kvartal. Rezultat navedenog kretanja BDP-a je lockdown, odnosno zaključavanje ekonomije i restriktivne mjere koje su imale za cilj ublažavanje broja oboljelih osoba. Sve to dovelo je do slabljenja eksterne, kao i domaće tražnje, a samim tim i do pada BDP-a, koji je u 2020. godini iznosio -2,8% i dobijen je na osnovu kvartalnih podataka.

Evropska unija je od početka krize veoma brzo djelovala kako bi podržala zemlje Zapadnog Balkana, mobilizujući veoma značajan paket od 3,3 mlrd. evra za pomoć u rješavanju neposredne zdravstvene krize i ublažavanju društveno-ekonomske krize. U oktobru 2020. godine, Komisija je predstavila Ekonomski i investicioni plan vrijedan 9 mlrd. evra, kako bi podstakla dugoročni oporavak Zapadnog Balkana i približavanje EU.<sup>1</sup>

Ekonomski rast je osnovica za rast životnog standarda, tj. boljeg zadovoljenja materijalnih potreba ljudi, odnosno povećanja plata i penzija. Imajući u vidu značaj ekonomskog rasta, cilj istraživanja je analizirati ekonomski rast, kao i uticaj pandemije na ekonomski rast i, na kraju, izgleda za oporavak privrede.

U istraživanju su korištene sljedeće naučnoistraživačke metode: deduktivna metoda, metoda analize, metoda sinteze i metoda komparacije.

## 1. PREGLED LITERATURE

### 1.1. Pojam, uloga i značaj ekonomskog rasta odnosno bruto domaćeg proizvoda

Bruto domaći proizvod jedan je od najvažnijih makroekonomskih agregata u sistemu nacionalnih računa i predstavlja najobuhvatnija mjeru ukupne proizvodnje neke privrede. Bruto domaći proizvod predstavlja vrijednost svih finalnih dobara i usluga proizvedenih u zemlji ili na području u određenom vremenskom periodu (kvartalno ili na godišnjem nivou). Takođe, BDP predstavlja značajan standard mjerenja nacionalnih ekonomskih uslova. Rast realnog BDP-a predstavlja jedan od ciljeva ekonomske politike države, pored ostvarenja pune zaposlenosti, stabilnih cijena, ravnoteže spoljnotrgovinske razmjene i stabilnog deviznog kursa.

Posmatrano sa potrošne strane, bruto domaći proizvod je nacionalni izdatak svih finalnih roba i usluga proizvedenih tokom godine po tržišnim cijenama.<sup>2</sup>

Bruto domaći proizvod definisan je za određenu geografsku oblast, uglavnom za državu, ali može biti definisan i za određeni region, grad ili za grupu zemalja kao što je Evropska unija (EU).<sup>3</sup>

Bruto domaći proizvod je najvažniji makroekonomski agregat u sistemu nacionalnih računa, predstavlja rezultat proizvodnih aktivnosti svih rezidentnih institucionalnih jedinica i predstavlja osnovni indikator ekonomskih aktivnosti.

Bruto domaći proizvod predstavlja najznačajniji makroekonomski indikator koji mjeri rezultate aktivnosti ekonomije jedne zemlje i koji se koristi za makroekonomske analize. Agregati nacionalnih računa imaju veliki značaj za realno planiranje i uspješno realizovanje ekonomske politike određene zemlje.

Obracun bruto domaćeg proizvoda za Republiku Srpsku zasnovan je na metodološkim postavkama Sistema nacionalnih računa (System of National Accounts – SNA 1993) i Evropskog sistema računa (European System of Accounts – ESA 1995). Međutim, od 2017. godine radi se na metodološkim postavkama u skladu sa međunarodnom metodologijom Evropski sistem računa 2010 (European System of Accounts – ESA 2010), gdje je referentna 2010. godina. Pri obračunu bruto domaćeg proizvoda koriste se administrativni izvori podataka, rezultati zvaničnih statističkih aktivnosti, a obuhvaćene su i procjene nepokrivene ekonomije i imputirane rente.<sup>4</sup>

Bruto domaći proizvod po stanovniku koristi se kao mjera ekonomskog razvoja i jedan je od najvažnijih makroekonomskih pokazatelja u privredi. Koristan je za analiziranje makroekonomske situacije između zemalja, odnosno u međunarodnom okruženju. Bruto domaći proizvod po stanovniku koristi se u kombinaciji sa mjerama pariteta kupovne moći (PPP) za objektivnije mjerenje životnog standarda stanovništva između zemalja. Međutim, da bismo uporedili dohodak između dvije zemlje, moramo preračunati dohotke u zajedničku jedinicu na osnovu kursa. Taj kurs naziva se paritet kupovne moći, odnosno PPP kurs (engl. Purchasing Power Parity – PPP)<sup>5</sup>.

Bruto domaći proizvod možemo iskazivati u tekućim i stalnim cijenama. Nominalni bruto domaći proizvod izražava se u tekućim cijenama, promjene u nominalnom BDP-u reflektuju se kroz promjene cijena i obima proizvodnje. Bruto domaći proizvod u stalnim cijenama je pokazatelj stepena i indikator mjerenja ekonomskog razvoja kojim se prati ekonomski rast između različitih perioda i zemalja, pri čemu se eliminiše uticaj promjene cijena. Bruto domaći proizvod u stalnim cijenama iskazuje se u cijenama prethodne godine, u cijenama 2015. godine (lančano povezane vrijednosti) i u stopama realnog rasta.<sup>6</sup>

## 2. REZULTATI ISTRAŽIVANJA I DISKUSIJA

### 2.1. Analiza ekonomskog rasta u Republici Srpskoj

Posljednjih godina u Republici Srpskoj zadržana je makroekonomska stabilnost, kao rezultat pozitivnih privrednih kretanja. Prosječna stopa ekonomskog rasta u Republici Srpskoj u periodu 2015–2019. iznosila je 3,2%, što je na nivou ekonomskog rasta zemalja Zapadnog Balkana. Na sljedećem grafikonu predstavice kretanje

<sup>1</sup> www.europa.ba

<sup>2</sup> Slavin, S. L. (1996). *Macroeconomics* (fourth edition), Irwin McGraw-Hill.

<sup>3</sup> Burda i Vploš, *Makroekonomija*, CLDS 2004, 20–21.

<sup>4</sup> Republički zavod za statistiku RS, Metodologija.

<sup>5</sup> Krueger, D. (2009). *Makroekonomija*, Univerzitet u Pensilvaniji.

<sup>6</sup> Republički zavod za statistiku RS, Metodologija.

## INTRODUCTION

The Republic of Srpska has been hit by the biggest economic and health crisis in 25 years. The crisis caused by the COVID-19 pandemic is global in scope. Countries that are our most important foreign trade partners have been hit by a significant recession caused by a pandemic. However, we should emphasize that of the countries that are our most important foreign trade partners, Serbia and Slovenia achieved positive economic growth in the first quarter of 2021.

In the Republic of Srpska, gross domestic product (GDP) in the first quarter of 2020 was positive, followed by a sharp decline, especially in the second quarter, and this trend of declining GDP continued until the end of the year, with the decline in GDP in the fourth quarter being significantly lower than in the second quarter. The result of this GDP trend is lockdown that is, closing the economy and restrictive measures aimed at reducing the number of sick people. All this has led to a reduction in external as well as domestic demand, and thus a decline in GDP, which in 2020 amounted to -2.8% and was obtained on the basis of quarterly data.

Since the beginning of the crisis, the European Union has acted very quickly to support the countries of the Western Balkans, mobilizing a very significant package of 3.3 billion euros to help solve the immediate health crisis and alleviate the socio-economic crisis. In October 2020, the Commission presented a 9 billion euros Economic and Investment Plan to foster the long-term recovery of the Western Balkans and rapprochement with the European Union.<sup>1</sup>

Economic growth is the basis for the growth of living standards, ie. better satisfaction of people's material needs, ie increase of salaries and pensions. Given the importance of economic growth, the aim of the research is to analyze economic growth, as well as the impact of the pandemic on economic growth and ultimately the prospects for economic recovery.

The following scientific research methods were used in the research: deductive method, method of analysis, method of synthesis and method of comparison.

## 1. LITERATURE OVERVIEW

### 1.1. Concept, role and significance of economic growth, or gross domestic product

Gross domestic product is one of the most important macroeconomic aggregates in the system of national accounts and represents the most comprehensive measure of the total production of an economy. Gross domestic product represents the value of all final goods and services produced in a country or region in a given period of time (quarterly or annually). Also, GDP is an important standard for measuring national economic conditions. Real GDP growth is one of the goals of the country's economic policy, in addition to achieving full employment, stable prices, the balance of foreign trade and a stable exchange rate.

Observed from the consumption side, gross domestic product is the national expenditure of all final goods and services produced during the year at market prices.<sup>2</sup>

Gross domestic product is defined for a certain geographical area mainly for a country, but it can also be defined for a certain region, city or group of countries such as the European Union (EU).<sup>3</sup>

Gross domestic product is the most important macroeconomic aggregate in the system of national accounts, it is the result of production activities of all resident institutional units and is the basic indicator of economic activities.

Gross domestic product is the most important macroeconomic indicator that measures the performance of a country's economy and is used for macroeconomic analysis. Aggregates of national accounts are of great importance for realistic planning and successful implementation of a country's economic policy.

The calculation of gross domestic product for the Republic of Srpska is based on the methodological settings of the System of National Accounts SNA 1993 and the European System of Accounts (ESA 1995). However, since 2017, we have been working on methodological settings in accordance with the international methodology European System Account 2010 (European System of Accounts - ESA 2010), where the reference year is 2010. In calculating the gross domestic product, administrative data sources, results of official statistical activities are used, and estimates of the uncovered economy and imputed rents are also included.<sup>4</sup>

Gross domestic product per capita is used as a measure of economic development and is one of the most important macroeconomic indicators in the economy. It is useful for analyzing the macroeconomic situation between countries, ie in the international environment. Gross domestic product per capita is used in combination with purchasing parity measures power (PPP) to more objectively measure the living standards of the population between countries. However, in order to compare income between the two countries, we need to convert income into a common unit based on exchange rates. This exchange rate is called purchasing power parity, or PPP<sup>5</sup>.

Gross domestic product can be expressed in current and constant prices. Nominal gross domestic product is expressed in current prices, changes in nominal GDP are reflected through changes in prices and volume of production. Gross domestic product at constant prices is an indicator of the degree and indicator of measuring economic development that monitors economic growth in different periods and countries, eliminating the impact of price changes. Gross domestic product at constant prices is expressed in previous year's prices, in 2015 prices (chain-linked values) and in real growth rates.<sup>6</sup>

## 2. RESEARCH RESULTS AND DISCUSSION

### 2.1. Analysis of economic growth in the Republic of Srpska

In recent years, macroeconomic stability has been maintained in the Republic of Srpska, as a result of positive economic trends. The average rate of economic growth in the Republic of Srpska in the period 2015-2019 was 3.2%, which is at the level of economic growth in the Western Balkans. In the following chart, we will present the movement of real GDP rates, as well as GDP per capita. As we can see, in 2020, all the observed countries achieved a real

<sup>1</sup> www.europa.ba

<sup>2</sup> Slavín, S. L. (1996). *Macroeconomics* (fourth edition), Irwin McGraw-Hill.

<sup>3</sup> *Macroeconomic*, Burda and Wyplosz, CLDS 2004, 20-21

<sup>4</sup> Republika Srpska Institute of Statistics, Methodology

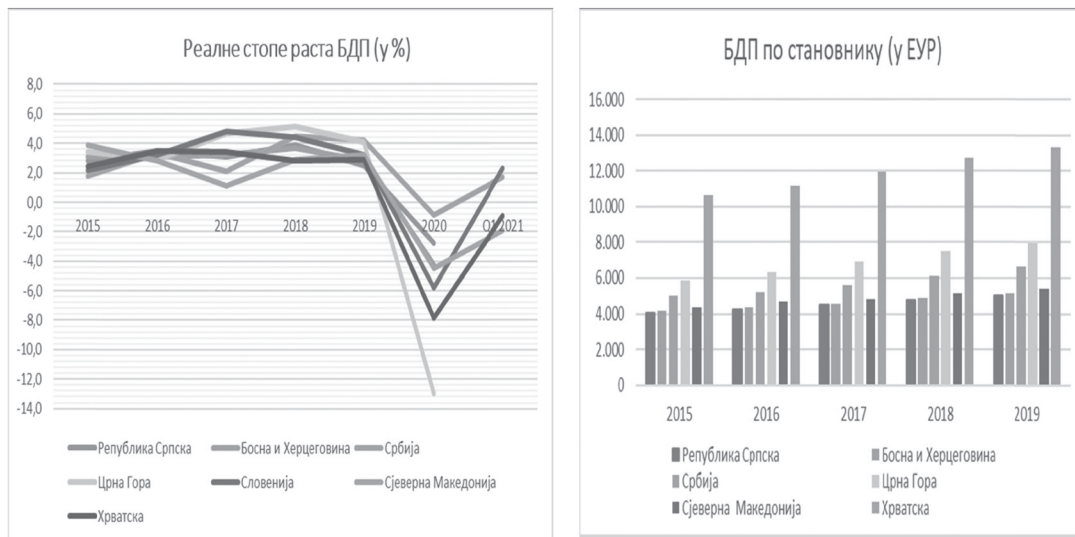
<sup>5</sup> Krueger, D. (2009). *Macroeconomics*, University of Pennsylvania

<sup>6</sup> Republika Srpska Institute of Statistics, Methodology

stopa realnog BDP-a, kao i BDP-a po stanovniku. Kao što vidimo, u 2020. godini sve posmatrane zemlje ostvarile su realnu stopu pada BDP-a, pri čemu je najmanji realni pad imala Srbija, a najveći Crna Gora. Crna Gora je imala drastičan pad od -13%, kao rezultat velikog pada u oblasti turizma, koji čini oko 22% BDP-a. Naime, Svjetska turistička organizacija opisala je 2020. godinu kao najgoru godinu

u istoriji turizma, kada je i u Crnoj Gori ostvareno oko 83% manje dolazaka turista. U 2019. godini, od posmatranih zemalja, najveći BDP po stanovniku imala je Hrvatska i on je iznosio 13.343 evra. Takođe, treba napomenuti da je Hrvatska jedina od posmatranih zemalja članica Evropske unije (EU).

Grafikon 1.

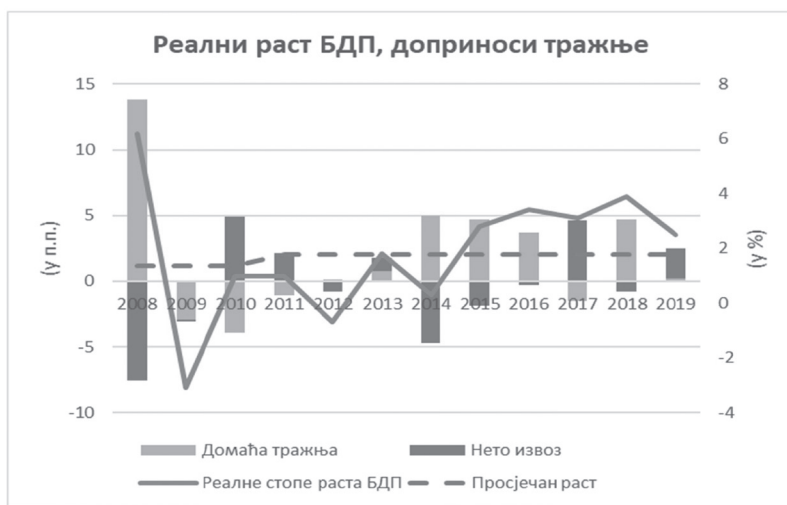


Izvori: Republički zavod za statistiku RS (RZS RS), Eurostat, Republički zavod za statistiku Srbije, Republički zavod za statistiku Slovenije.

Na narednom grafikonu prikazani su doprinosi rastu BDP-a na osnovu tražnje. Posmatračemo seriju podataka u periodu 2008–2019. U posmatranom periodu, prosječna stopa rasta BDP-a iznosila je oko 2%. Za razliku od 2008. godine, kada je najveći doprinos rastu BDP-a od 13,8% imala domaća tražnja, u 2019. godini najveći

doprinos rastu BDP-a dao je neto izvoz – 2,3%. U 2019. godini učešće konačne potrošnje i bruto investicija u stalna sredstva u BDP-u iznosilo je 85% i 21,2% respektivno, što je za po 1,5% manje na godišnjem nivou.

Grafikon 2.



Izvor: autorova analiza podataka, Republički zavod za statistiku RS

U 2020. godini nastavljeno je negativno kretanje industrijske proizvodnje iz 2019. godine, koja je za 6,7% manja na godišnjem nivou. Najveći pad u okviru industrije imala je prerađivačka industrija (10,3%). Istovremeno, ovo područje je dalo i najveći doprinos padu ukupne industrije jer učestvuje u ukupnoj strukturi sa oko 60%. Posmatrajući sektor zaduženosti, ukupan dug u BDP-u u 2020. godini iznosio je 5,8 mlrd. KM i veći je za 4,9% u odnosu na prethodnu godinu. Kao što možemo zaključiti, ekonomska i zdravstvena kriza izazvana pandemijom COVID-19 uticala je na pad u svim sektorima privrede. Tako je i u spoljnom sektoru u 2020. godini zabilježen pad izvoza i uvoza roba od 6,2% i 6,5%, respektivno. Značajan

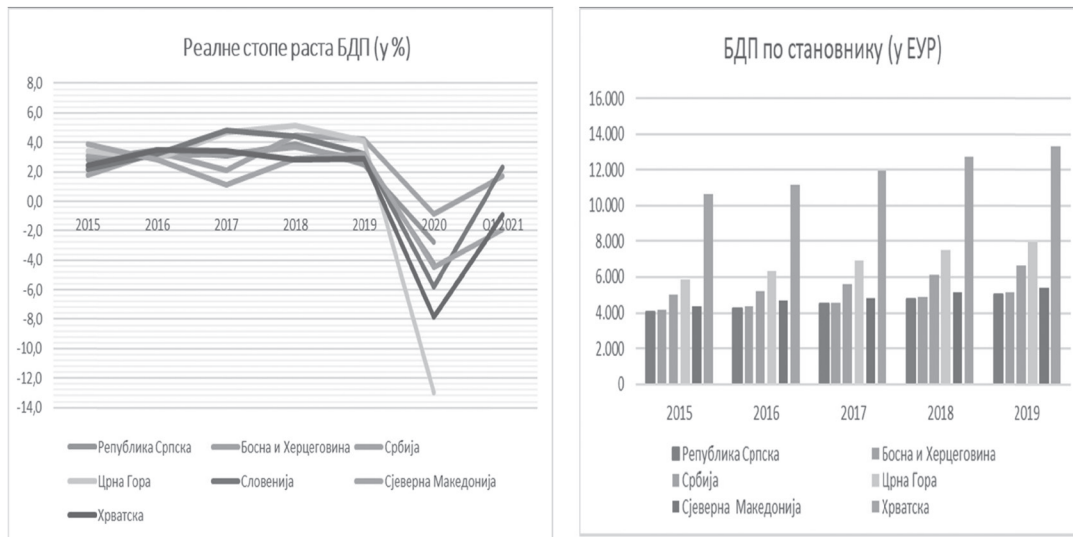
doprinos padu izvoza dali su sljedeći proizvodi: vještački korund, aluminijum-oksidi i aluminijum-hidroksid, električna energija i obuća sa vanjskim đonovima od gume, plastične mase, kože ili umjetne kože i gornjim dijelovima od kože. Posmatrano po grupama proizvoda, najveće učešće u izvozu ostvaruje električna energija sa 250 mil. KM, što iznosi 7,4% od ukupnog izvoza, dok najveće učešće u uvozu ostvaruju lijekovi, sa ukupnom vrijednošću od 204 mil. KM, što iznosi 4,6% od ukupnog uvoza.

Pretpostavlja se da će u 2021. godini značajan doprinos rastu BDP-a dati jačanje domaće tražnje, odnosno rast privatne potrošnje, investicija, kao i neto izvoz.

rate of GDP decline, with Serbia having the lowest real decline and Montenegro the largest. Montenegro had a drastic decline of -13%, as a result of a large decline in tourism, which accounts for about 22% of GDP. Namely, the World Tourism Organization described 2020 as the worst year in the history of tourism, when about 83%

fewer tourist arrivals were realized in Montenegro as well. In 2019, Croatia had the highest GDP per capita of 13,343 euros, and we should also mention that Croatia is the only observed member state of the European Union (EU).

**Chart 1.**

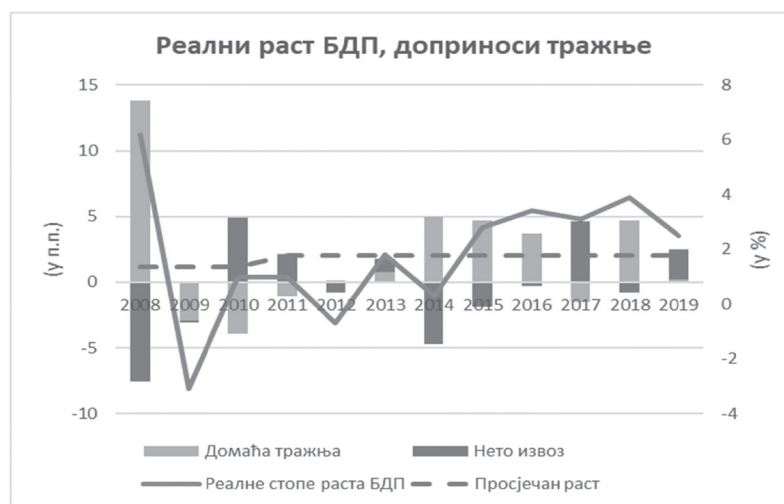


Source: Republika Srpska Institute of Statistics, Eurostat, Statistical Office of the Republic of Serbia, The Statistical Office of the Republic of Slovenia

The following Chart 2. shows the contributions to GDP growth based on demand. We will observe a series of data in the period 2008-2019. In the observed period, the average GDP growth rate was about 2%. In contrast to 2008, when the largest contribution to GDP growth of 13.8

pp was made by domestic demand in 2019, the largest contribution to GDP growth was made by net exports of 2.3 pp. In 2019, the share of final consumption and gross investment in fixed assets in GDP was 85% and 21.2%, respectively, which is 1.5 pp less annually.

**Chart 2.**



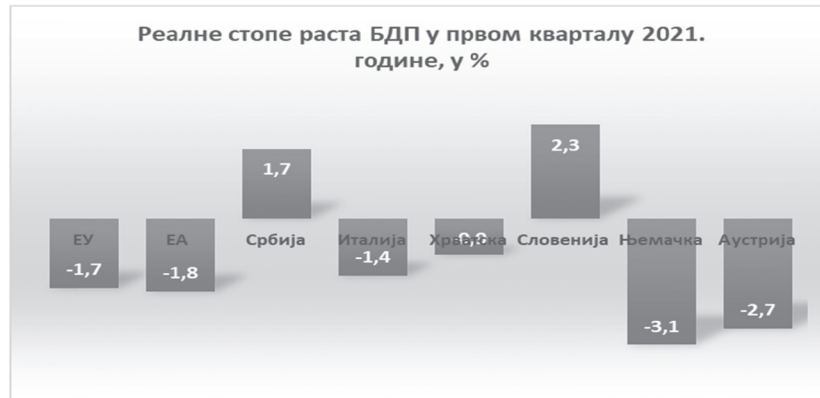
Source: Author's data analysis, Republika Srpska Institute of Statistics

In 2020, the negative trends in industrial production from 2019 continued, which is 6.7% lower on an annual level. The largest decline in the industry was the manufacturing industry of 10.3%, at the same time this area gave the largest contribution to the decline of the total industry because it participates in the overall structure with about 60%. Looking at the indebtedness sector, the total debt in GDP in 2020 amounted to 5.8 billion BAM and is higher by 4.9 pp compared to the previous year. As we can conclude, the economic and health crisis caused by the COVID-19 pandemic has affected the decline in all sectors of the economy. Thus, in the foreign sector in 2020, there was a decline in exports and imports

of goods of 6.2% and 6.5%, respectively. The following products made a significant contribution to the decline in exports: Artificial corundum, aluminum oxide and aluminum hydroxide, electricity and footwear with outer soles of rubber, plastic, leather or artificial leather and leather uppers. Observed by product groups, the largest share in exports had electricity with 250 billion BAM, which is 7.4% of total exports, while the largest share in imports had medicines, with a total value of 204 billion BAM, which is 4.6% of total imports.

In 2021, it is assumed that a significant contribution to GDP growth will be given by the strengthening of domestic demand, ie the growth of private consumption, investment and net exports.

Grafikon 3.



Izvor: Eurostat, Republički zavod za statistiku Republike Srbije, Republički zavod za statistiku Republike Slovenije

Na prethodnom grafikonu predstavljeno je kretanje realnih stopa rasta BDP-a kod zemalja koje su najznačajniji spoljnotrgovinski partneri Republike Srpske u prvom kvartalu 2021. godine. Od posmatranih zemalja, samo su Slovenija i Srbija ostvarile pozitivnu realnu stopu rasta BDP-a od po 2,3% i 1,7% respektivno, dok je Njemačka ostvarila najveći pad stope realnog BDP-a, koja je iznosila -3,1%. Jedan od razloga zašto je kod većine zemalja u našem okruženju u prvom kvartalu 2021. godine ostvarena negativna stopa rasta BDP-a jeste taj što je Republiku Srpsku, kao i zemlje okruženja, pandemija virusa korona pogodila krajem prvog kvartala 2020. godine, kada su većine ekonomija imale pozitivnu stopu rasta BDP-a, dok je u prvom kvartalu 2021. godine ekonomija bila uglavnom zatvorena zbog trećeg talasa pandemije.

**2.2. Analiza BDP-a korištenjem standarda kupovne moći (SKM)**

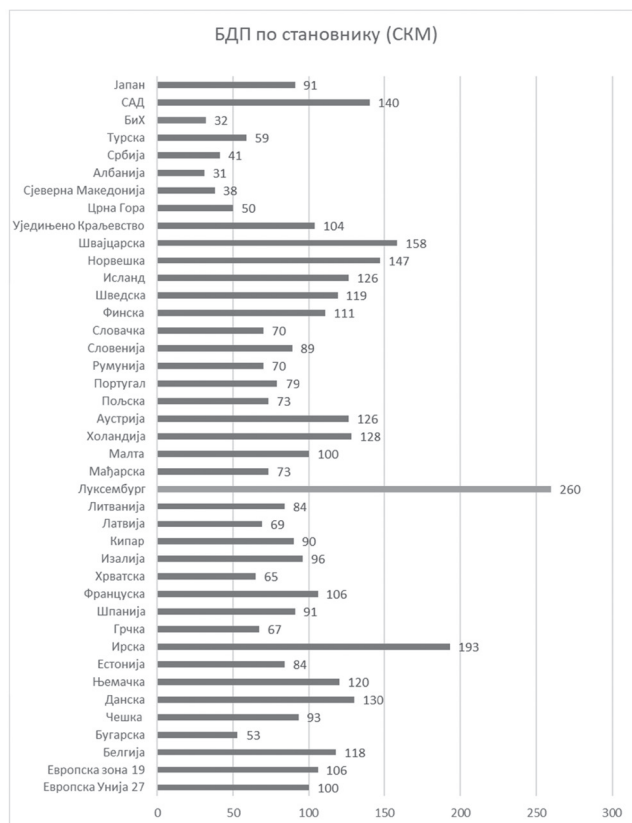
Rezultati Evropskog programa poređenja cijena i BDP-a pokazuju da BDP po stanovniku u Bosni i Hercegovini izražen u paritetu kupovne

moći za 2019. iznosi samo 32% prosjeka 27 zemalja članica EU. Posmatrajući zemlje članice EU, najveći BDP po stanovniku prema SKM (standard kupovne moći) ima Luksemburg i njegov nivo je više od 2,5 puta viši od prosjeka EU-27 i iznosi 260%, dok najniži nivo BDP-a mjereno SKM ima Bugarska i on iznosi 53% prosjeka EU-27. Rezultat visokog nivoa BDP-a po stanovniku u Luksemburgu dijelom je posljedica velikog udjela prekograničnih radnika u ukupnom broju zaposlenih. Iako prekogranični radnici učestvuju u BDP-u, oni ne čine dio rezidentnog stanovništva koji je uključen u izračunavanje BDP-a po stanovniku.

Uobičajeno je da se BDP po stanovniku koristi kao pokazatelj nivoa ekonomskog blagostanja u zemljama.

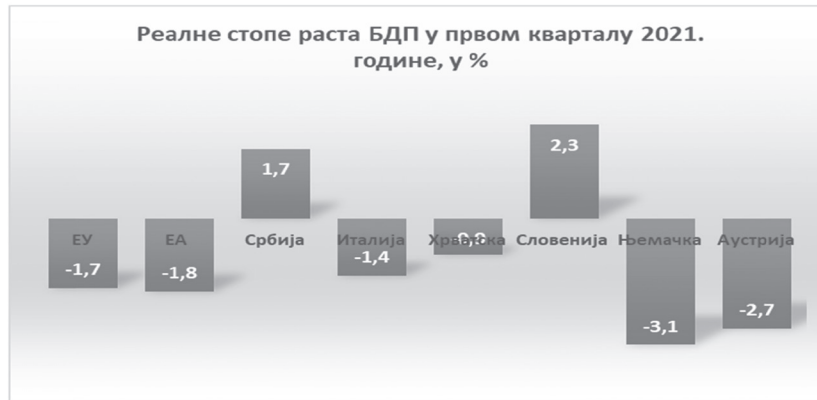
Najniži BDP po stanovniku imala je Albanija i on iznosi 31% prosjeka zemalja EU-27.

Grafikon 4.



Izvor: Eurostat, autorova analiza podataka

Chart 3.



Source: Eurostat, Statistical Office of the Republic of Serbia, The Statistical Office of the Republic of Slovenia

The previous chart 3. presents the movement of real GDP growth rates in the countries that are the most important foreign trade partners of the Republic of Srpska in the first quarter of 2021. Of the observed countries, only Slovenia and Serbia achieved a positive real GDP growth rate of 2.3% and 1.7%, respectively, while Germany achieved the largest decline in the real GDP rate of -3.1%.

One of the reasons why most countries in our region in the first quarter of 2021 achieved a negative GDP growth rate is that the Republic of Srpska and the surrounding countries were hit by a pandemic caused by coronavirus at the end of the first quarter of 2020 when most economies had a positive rate. GDP growth, while in the first quarter of 2021 the economy was largely closed due to the third wave of the pandemic.

**2.2. GDP analysis using purchasing power standard (PPS)**

The results of the European Price Comparison Program and GDP show that GDP per capita in Bosnia and Herzegovina, expressed

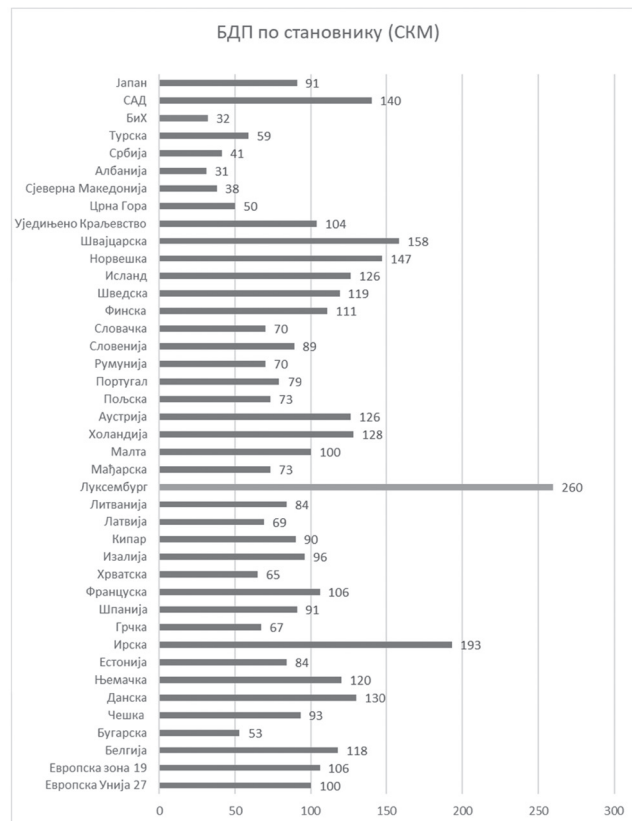
in purchasing power parity for 2019, is only 32% of the average of the 27 EU member states.

Looking at EU member states, the highest GDP per capita according to PPS (purchasing power standard) is Luxembourg and its level is more than 2.5 times higher than the EU-27 average and is 260%, while the lowest GDP measured by PPS is Bulgaria and it is 53% of the EU-27 average. The result of the high level of GDP per capita in Luxembourg is partly due to the large share of cross-border workers in the total number of employees. Although cross-border workers participate in GDP, they do not form part of the resident population involved in calculating GDP per capita.

It is common for GDP per capita to be used as an indicator of the level of economic well-being in countries.

Albania had the lowest GDP per capita at 31% of the EU - 27 average.

Chart 4.



Source: Eurostat, author's data analysis

### 2.3. Usporedni prikaz sa međunarodnim okruženjem

U publikaciji Međunarodnog monetarnog fonda (MMF) koja je objavljena u januaru 2021. godine sa oprezom se pristupa očekivanjima koja se odnose na oporavak ekonomija. Očekivanja su oprezna zbog pojave trećeg talasa pandemije.<sup>7</sup> U vezi s tim, predviđa se da će globalna ekonomija porasti za 5,5% u 2021. i 4,2% u 2022. Prognoza za 2021. revidirana je za 0,3% naviše u odnosu na prethodnu prognozu, što odražava očekivanja od jačanja aktivnosti zasnovane na procesu vakcinacije u toku godine, kao i dodatne podrške politici u nekoliko vodećih ekonomija. Predviđeni oporavak rasta ove godine uslijedio je nakon teškog kolapsa 2020. godine, koji je imao velike negativne uticaje na žene, mlade, siromašne, neformalno zaposlene i one koji rade u intenzivnim sektorima. Smanjenje globalnog rasta za 2020. procjenjuje se na -3,5%, što je za 0,9% više od predviđenog u prethodnoj prognozi (što odražava zamah jači od očekivanog u drugoj polovini 2020. godine).

Predviđa se da će se snaga oporavka značajno razlikovati među zemljama, u zavisnosti od pristupa vakcinaciji, efikasnosti podrške politici, izloženosti prelivanju efekata iz različitih zemalja i strukturnih karakteristika kao rezultat krize.

U projekcijama MMF iz aprila 2021. godine, u 2021. godini predviđa se globalni rast od 6%, dok se za 2022. godinu predviđa nešto umjereniji rast od 4,4%. Projekcije za 2021. i 2022. godinu revidirane su naviše u odnosu na projekcije iz oktobra 2020. godine. Revizija naviše rezultat je dodatne fiskalne podrške u nekoliko velikih ekonomija, očekivanog oporavaka usljed procesa vakcinacije

u drugoj polovini 2021. godine i nastavka prilagođavanja ekonomske aktivnosti novonastaloj situaciji. Velika neizvjesnost odnosi se na ostvarenje projekcija i direktno je povezana sa kretanjem pandemije, efikasnošću političke podrške koja pruža most ka normalizaciji zasnovanoj na vakcinama i razvojem finansijskih uslova.<sup>8</sup>

Potrebna je jaka multilateralna saradnja da bi se pandemija stavila pod kontrolu. Takvi napori uključuju jačanje finansiranja sistema COVAKS za ubrzanje pristupa vakcinama za sve zemlje, osiguravajući univerzalnu distribuciju vakcina i olakšavajući pristup terapiji po pristupačnim cijenama za sve. Mnoge zemlje, posebno ekonomije u razvoju, sa niskim prihodima, ušle su u krizu sa visokim dugom za koji se očekuje da bi trebalo da raste tokom pandemije. Globalna zajednica moraće da nastavi saradivati kako bi ovim zemljama obezbijedila adekvatan pristup međunarodnoj likvidnosti. Tamo gdje je suvereni dug neodrživ, zemlje koje ispunjavaju uslove treba da sarađuju sa povjeriocima na restrukturiranju svog duga prema Zajedničkom okviru, dogovorenom od strane G20.

Prema ekonomskoj grupaciji zemalja, Republika Srpska izvozi u zemlje EU oko 75% ukupnog izvoza, dok iz zemalja EU uvozi oko 60% ukupnog uvoza. U vezi s tim, kretanje BDP-a u zemljama EU direktno utiče i na ekonomiju Republike Srpske. Na narednom grafikonu predstavice kretanje BDP-a u zemljama EU, Bosni i Hercegovini i Republici Srpskoj.

Na sljedećem grafikonu date su procjene i projekcije MMF-a za period 2021–2024. koje se odnose na Bosnu i Hercegovinu, EU i svijet:

Grafikon 5.



Izvor: MMF, Outlook April 2021.

U poređenju sa prethodnim projekcijama iz oktobra 2020. godine, procjene i projekcije BDP-a za BiH značajno su smanjene. Tako su procjene za 2021. godinu za Bosnu i Hercegovinu u aprilu 2021. godine smanjene za 1,5% u odnosu na oktobar 2020. godine. Takođe, u MMF Outlooku iz aprila 2021. godine, smanjena je stopa rasta BDP-a za EU za 2021. godinu za 0,7% i iznosi 4,4%, dok je globalno za svijet realna stopa rasta BDP-a povećana za 0,9% i iznosi 6%.

Centralna banka BiH (CB BiH) u maju 2021. godine objavila je projekcije BDP-a za 2021. i 2022. godinu. Navedene projekcije revidovane su naviše u poređenju sa prethodnim projekcijama iz novembra 2020. godine. Za 2021. godinu očekuje se rast od 3,4%, što je za 0,7% više u odnosu na prethodne projekcije. Projekcije su revidovane naviše zbog kretanja ekonomskih pokazatelja u četvrtom kvartalu 2020. godine i prva četiri mjeseca 2021. godine, kada su izvoz roba i industrijska proizvodnja ostvarili značajan rast kako na nivou Republike Srpske tako i na nivou BiH. Pretpostavke su da će u 2021. godini doći do rasta lične potrošnje (pad nezaposlenosti, rast plata, rast doznaka iz inostranstva), manjeg pozitivnog doprinosa

rasta državne potrošnje i oporavka sektora usluga. Takođe, naviše su revidovane i varijable koje predstavljaju inostranu potražnju. U 2022. godini očekuje se rast na nivou BiH od 3,4%, što je za 0,4% više u odnosu na prethodne projekcije.

Prema izvještaju Svjetske banke o globalnim ekonomskim prilikama koji je objavljen u junu 2021. godine, očekuje se snažan globalni rast, koji će biti neujednačen između ekonomija. Najveći rast, odnosno snažan oporavak očekuje se u najrazvijenijim ekonomijama, dok će manje razvijene ekonomije zaostajati. Globalni izgledi su i dalje pod velikom neizvjesnošću zbog pandemije, kao i mogućih finansijskih šokova. Kreatori politika suočeni su s teškim postupkom uravnoteženja, jer nastoje održati oporavak, a istovremeno štite stabilnost cijena i fiskalnu održivost. Sveobuhvatan skup politika biće potreban za ostvarenje snažnog dugoročnog oporavka.

Očekuje se da će globalna ekonomija dostići rast do 5,6% u 2021. godini, što je njen najjači tempo nakon recesije u posljednjih 80 godina. Ekonomski rast u ECA9 regiji iznosiće 3,9%. U BiH se očekuje

<sup>7</sup> World Economic Outlook Reports, January 2021.

<sup>8</sup> World Economic Outlook Reports, April 2021.



### 2.3. Comparative overview with the international environment

A publication published in January 2021 by the International Monetary Fund (IMF) cautiously approaches expectations related to economic recovery. Expectations are cautious due to the third wave of the pandemic.<sup>7</sup> In this regard, the global economy is projected to grow by 5.5% in 2021 and 4.2% in 2022. The 2021 forecast has been revised 0.3 pp higher than the previous forecast, reflecting expectations from strengthening activities based on the vaccination process during the year as well as additional policy support in several leading economies. The projected recovery in growth this year followed a severe collapse in 2020 that had major negative impacts on women, young people, the poor, the informally employed and those working in the intensive sectors. The decline in global growth for 2020 is estimated at -3.5 percent, which is 0.9 pp more than projected in the previous forecast (which reflects the momentum stronger than expected in the second half of 2020).

The strength of the recovery is projected to vary significantly between countries, depending on access to vaccination, the effectiveness of policy support, exposure to spillover effects from different countries, and structural characteristics as a result of the crisis.

In the IMF projections from April 2021, global growth of 6% is projected in 2021, while a slightly more moderate growth of 4.4% is projected for 2022. The projections for 2021 and 2022 have been revised upwards compared to the projections from October 2020. The upward revision is the result of additional fiscal support in several large economies, the expected recovery due to the vaccination process in the second half of 2021 and the continued adjustment

of economic activity to the new situation. The great uncertainty relates to the realization of projections and is directly related to the pandemic, the effectiveness of political support that provides a bridge to normalization based on vaccines and the development of financial conditions.<sup>8</sup>

Strong multilateral cooperation is needed to bring the pandemic under control. Such efforts include strengthening funding for the COVAX system to accelerate access to vaccines for all countries, ensuring universal distribution of vaccines and facilitating access to affordable therapy for all. Many countries, especially low-income developing economies, have entered a crisis with high debt, which is expected to grow during the pandemic. The global community will need to continue to work together to provide these countries with adequate access to international liquidity. Where sovereign debt is unsustainable, eligible countries should work with creditors to restructure their debt under the Common Framework agreed by the G20.

According to the economic group of countries, the Republic of Srpska exports to EU countries about 75% of total exports, while imports from EU countries about 60% of total imports. In this regard, the movement of GDP in EU countries directly affects the economy of the Republic of Srpska. In the following chart, we will present the movement of GDP in the EU countries, Bosnia and Herzegovina and the Republic of Srpska.

The following chart shows the IMF estimates and projections for the period 2021-2024 relating to Bosnia and Herzegovina, the EU and the world:

**Chart 5.**



Source: IMF, Outlook April 2021.

Compared to previous projections from October 2020, estimates and projections of GDP for BiH have been significantly reduced. Thus, estimates for 2021 for Bosnia and Herzegovina in April 2021 were reduced by 1.5 pp compared to October 2020. Also, in the IMF Outlook from April 2021, the growth rates for 2021 GDP for the EU were reduced by 0.7 pp and amounted to 4.4%, while globally for the world the real GDP growth rate increased by 0.9 pp and amounts to 6%.

In May 2021, the Central Bank of BiH (CB BiH) published GDP projections for 2021 and 2022. These projections have been revised upwards in comparison with the previous projections from November 2020. In 2021, growth of 3.4% is expected, which is 0.7 pp more than in previous projections. The projections have been revised upwards due to the movement of economic indicators in the fourth quarter of 2020 and the first four months of 2021, when exports of goods and industrial production achieved significant growth

both at the level of the Republic of Srpska and at the level of BiH. Assumptions are that in 2021 there will be an increase in personal consumption (fall in unemployment, increase in wages, increase in remittances from abroad), a smaller positive contribution to the growth of government spending, recovery of the services sector. Also, the variables representing foreign demand have been revised upwards. In 2022, growth in BiH is expected to be 3.4%, which is 0.4 pp more than in previous projections.

According to the World Bank's report on Global Economic Opportunities, published in June 2021, strong global growth is expected, which will be uneven between economies. The highest growth, ie strong recovery, is expected in the most developed economies, while less developed economies will lag behind. The global outlook remains highly uncertain due to the pandemic as well as possible financial shocks. Policymakers face a difficult balancing process as they seek to sustain a recovery while protecting price stability and

<sup>7</sup> World Economic Outlook Reports, January 2021.

<sup>8</sup> World Economic Outlook Reports, April 2021.

nešto sporiji oporavak ekonomije u odnosu na ostatak regije i rast do 2,8 procenata u 2021. godini. Najveći razlog je neujednačena distribucija vakcina, što dovodi do usporavanja normalizovanja ekonomskih aktivnosti u mnogim zemljama regije.<sup>9</sup>

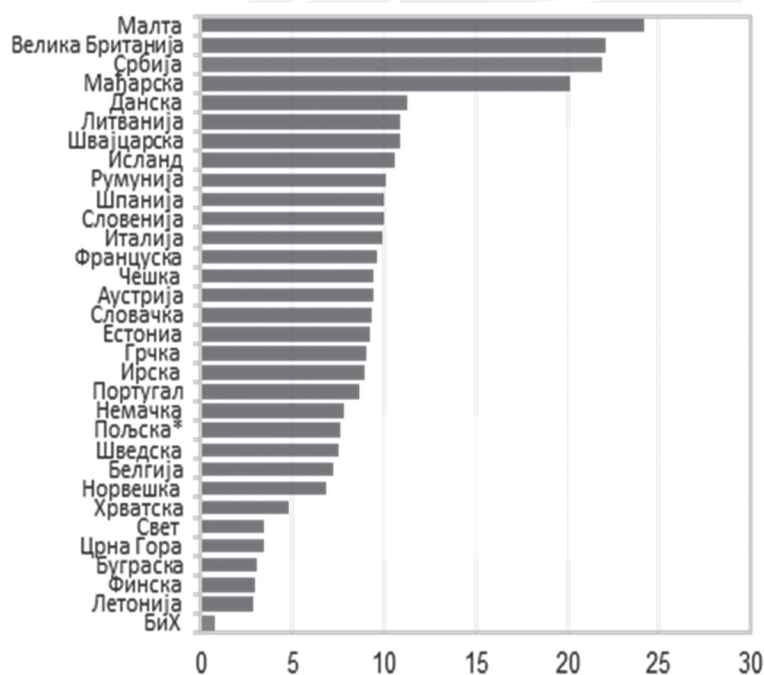
Očekuje se da će do 2022. godine proizvodnja u svim regijama ostati ispod projekcija prije pandemije, umanjena trajnom pandemijom i njenim nasljeđem, što uključuje veća opterećenja dugom i štetu na mnogim pokretačima potencijalne proizvodnje. Očekuje se da će oporavak u malim, o turizmu zavisnim ekonomijama biti posebno slab, jer će neka ograničenja putovanja ostati na snazi sve dok pandemija ne bude stavljena pod kontrolu. Tempo uvođenja vakcina razlikuje se među zemljama, što takođe utiče na neujednačen oporavak između ekonomija.

#### 2.4. Mogući oporavak privrede

EU je usvojila instrument za privremeni oporavak NextGenerationEU vrijedan 750 mlrd. evra za rješavanje neposredne ekonomske i

socijalne štete izazvane pandemijom virusa korona, koji se odnosi na period 2021–2027.<sup>10</sup> Dugoročni budžet EU i inicijativa NextGenerationEU – privremeni instrument za podsticanje oporavka – najveći je paket podsticaja koji je ikad finansiran u Evropi. Poboljšani mehanizmi fleksibilnosti u dugoročnom budžetu omogućice reagovanje u nepredviđenim situacijama. To znači da je budžet prilagođen ne samo situaciji u kojoj se nalaze zemlje EU, već i nesigurnoj budućnosti. Imajući u vidu sve navedeno, kao i činjenicu da je EU naš najveći spoljnotrgovinski partner, navedeni instrument pomoći indirektno će uticati i na našu ekonomiju. Za dalji oporavak veoma je važan ubrzan proces vakcinacije. Kao što vidimo na narednom grafikonu, BiH je na začelju po broju potpuno vakcinisanih osoba na 100 stanovnika. Sa druge strane, na osnovu nabavke vakcina i najava novih nabavki u Republici Srpskoj, očekivanja su da bi do kraja godine značajan broj ljudi trebalo da se vakciniše.

**Grafikon 6.** Broj potpuno vakcinisanih na 100 stanovnika



Izvor podataka: Our World in Data, 30. April, 2021

## ZAKLJUČAK

U 2020. godini Republiku Srpsku zadesila je najveća recesija u posljednjih 25 godina, kada je došlo do pada realne stope BDP-a za 2,8%, uglavnom zbog povećanog broja novih slučajeva COVID-19, pada potrošnje, investicija i potražnje iz inostranstva. Uzimajući u obzir podatke iz četvrtog kvartala 2020. godine i prva četiri mjeseca 2021. godine, ekonomija Republike Srpske pokazuje značajan oporavak. U prva četiri mjeseca 2021. godine izvoz roba imao je značajan rast od čak 24,9%, a uvoz robe imao je nominalni rast od oko 15%. Pokrivenost izvoza uvozom iznosila je 81,9%. U navedenom periodu prosječna stopa rasta industrijske proizvodnje iznosila je 14,3%.

U Republici Srpskoj do kraja godine najavljen je investicioni ciklus vrijedan nekoliko milijardi maraka. Prvenstveno, riječ je o javnim investicijama u svim sektorima privrede, uključujući energetiku,

elektroprivredne, hidrocentrale, auto-puteve i aerodrom u Trebinju. Ove investicije trebalo bi da predstavljaju značajan zamajac privrednom razvoju i jačanju Republike Srpske, koji će se direktno odraziti na ekonomski rast i zapošljavanje. S obzirom na navedeno, kao i podatke iz četvrtog kvartala 2020. godine i u periodu januar–april 2021. godine u Republici Srpskoj se očekuje snažan, mada neizvjestan oporavak. Takođe, treba napomenuti da je broj oboljelih od virusa korona drastično opao nakon trećeg talasa pandemije, što je slučaj i u svim zemljama okruženja. Mogući rizici koji bi mogli uticati na neostvarenje očekivanja u 2021. i 2022. godini jesu: neizvjesnost u pogledu intenziteta i trajanja pandemije izazvane virusom korona, kao i zdravstvene, socijalne i ekonomske posljedice u kratkom i srednjem roku, prekid u lancima proizvodnje i snabdijevanja, pad globalne ekonomske aktivnosti, pooštavanje uslova na međunarodnim finansijskim tržištima i odliv kapitala iz zemalja u razvoju.

<sup>9</sup> World Bank, Global Economic Prospects, June 2021.

<sup>11</sup> <https://ec.europa.eu/info/strategy/recovery-plan-europe>

fiscal sustainability. A comprehensive set of policies will be needed to achieve a strong long-term recovery.

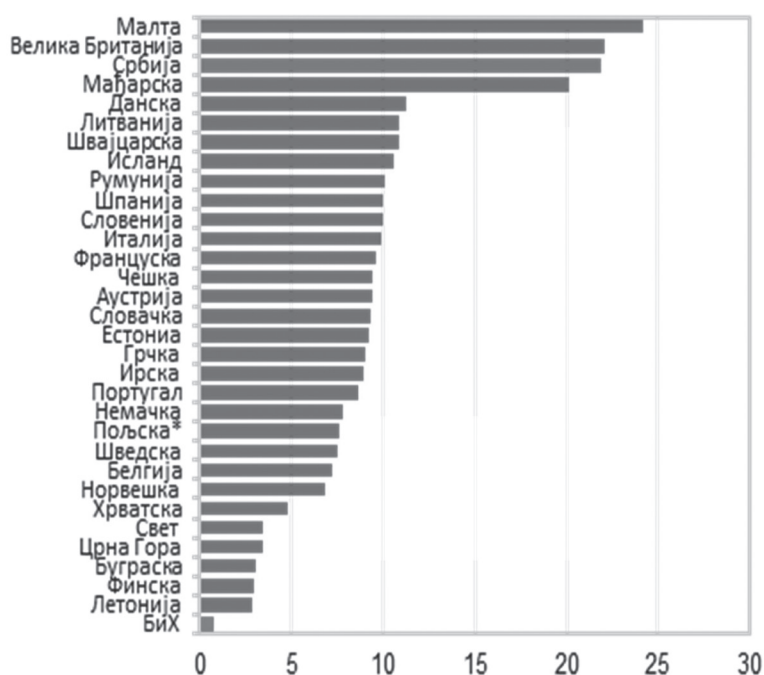
The global economy is expected to grow to 5.6% in 2021, its strongest pace since the recession in 80 years. Economic growth in the ECA region will be 3.9%. In BiH, a somewhat slower economic recovery is expected compared to the rest of the region and growth of up to 2.8 percent in 2021. The biggest reason is the uneven distribution of vaccines, which leads to a slowdown in the normalization of economic activities in many countries in the region.<sup>9</sup>

By 2022, production in all regions is expected to remain below pre-pandemic projections, reduced by a permanent pandemic and its legacy, which includes higher debt burdens and damage to many drivers of potential production. Recovery in small, tourism-dependent economies is expected to be particularly weak, as some travel restrictions will remain in place until the pandemic is brought under control. The pace of vaccine introduction varies between countries, which also affects the uneven recovery between economies.

## 2.4. Possible economic recovery

The EU has adopted an instrument for temporary recovery NextGenerationEU worth 750 billion euros to address the immediate economic and social damage caused by the coronavirus pandemic, which covers the period 2021-2027.<sup>10</sup> The EU's long-term budget and the NextGenerationEU initiative - a temporary instrument to boost recovery - is the largest stimulus package ever funded in Europe. Improved flexibility mechanisms in the long-term budget will enable it to react in unforeseen situations. Which means that the budget is adjusted not only to the situation of EU countries, but also to the uncertain future. Taking into account all the above, as well as the fact that the EU is our largest foreign trade partner, this aid instrument will indirectly affect our economy. An accelerated vaccination process is very important for further recovery. As we can see in the following chart, BiH is at the bottom in terms of the number of fully vaccinated persons per 100 inhabitants. On the other hand, based on the procurement of vaccines and the announcement of new procurements in the Republic of Srpska, it is expected that a significant number of people should be vaccinated by the end of the year.

**Chart 6. Number of fully vaccinated per 100 inhabitants**



Source: Our World in Data, April 30, 2021

## CONCLUSION

In 2020, the Republic of Srpska was hit by the biggest recession in 25 years, when the real GDP rate fell by 2.8%, mainly due to the increased number of new COVID-19 cases, falling consumption, investment and demand from abroad. Taking into account the data from the fourth quarter of 2020 and the first four months of 2021, the economy of the Republic of Srpska is showing a significant recovery. In the first four months of 2021, exports of goods had a significant growth of as much as 24.9%, and imports of goods had a nominal growth of about 15%. The coverage of exports by imports amounted to 81.9%. In the mentioned period, the average growth rate of industrial production was 14.3%.

An investment cycle worth several billion BAM has been announced in the Republic of Srpska by the end of the year. These are primarily public investments in all sectors of the economy, including energy, electricity, hydropower, highways and the airport in Trebinje. These investments should be a significant impetus for economic development and strengthening of the Republic of Srpska, which will directly affect economic growth and employment. Given the above, as well as data from the fourth quarter of 2020 and in the period January-April 2021, a strong but uncertain recovery is expected in the Republic of Srpska. We should also mention that the number of people infected with the corona virus dropped drastically after the third wave of the pandemic, which is the case in all neighboring countries. Possible risks that could affect the failure to meet expectations in 2021 and 2022 are: uncertainty about the intensity

<sup>9</sup> World Bank, Global Economic Prospects, June 2021.

<sup>10</sup> <https://ec.europa.eu/info/strategy/recovery-plan-europe>

## IZVORI

1. Slavin, S. L. (1996). *Macroeconomics*, fourth edition. Irwin McGraw-Hill.
2. Burda, M., Viplo, C. (2004). *Makroekonomija*. Centar za liberalno-demokratske studije, Beograd
3. Krueger, D. (2009). *Makroekonomija*. Sveučilište u Pensilvaniji.
4. <https://www.rzs.rs.ba/>
5. <https://www.stat.si/StatWeb/en>
6. <http://publikacije.stat.gov.rs/G2021/HTML/G20211148.html>
7. <https://www.dzs.hr/>
8. Global economy on firmer ground, but with divergent recoveries amid high uncertainty, preuzeto 1. 6. 2021. sa: <https://www.imf.org/en/Publications/WEO/Issues/2021/03/23/world-economic-outlook-april-2021>
9. World Economic Outlook Update January 2021, Policy Support and Vaccines Expected to Lift Activity, preuzeto 20. 5. 2021. sa: <https://www.imf.org/en/Publications/WEO/Issues/2021/01/26/2021-world-economic-outlook-update>
10. World Economic Outlook, October 2020: A Long and Difficult Ascent, preuzeto 15. 5. 2021. sa: <https://www.imf.org/en/Publications/WEO/Issues/2020/09/30/world-economic-outlook-october-2020>
11. The Global Economy: on Track for Strong but Uneven Growth as COVID-19 Still Weighs, preuzeto 10. 6. 2021. sa: <https://www.worldbank.org/en/news/feature/2021/06/08/the-global-economy-on-track-for-strong-but-uneven-growth-as-covid-19-still-weighs>
12. Recovery plan for Europe, preuzeto 19. 6. 2021. sa: [https://ec.europa.eu/info/strategy/recovery-plan-europe\\_en](https://ec.europa.eu/info/strategy/recovery-plan-europe_en)
13. Projekcije ekonomske aktivnosti u BiH u 2021. i 2022. godini korigovane navise, preuzeto 29. 5. 2021. sa: <https://www.cbbh.ba/press/ShowNews/1347>
14. Godišnji izveštaj o stabilnosti finansijskog sistema, preuzeto 20. 6. 2021. sa: [https://nbs.rs/sr\\_RS/drugi-nivo-navigacije/publikacije-i-istrasivanja/GISFS/](https://nbs.rs/sr_RS/drugi-nivo-navigacije/publikacije-i-istrasivanja/GISFS/)
15. [www.europa.ba](http://www.europa.ba)
16. <https://ourworldindata.org/>

and duration of the coronary virus pandemic (COVID-19), as well as health, social and economic consequences in the short and medium term; production and supply chains, declining global economic activity and tightening conditions in international financial markets and the outflow of capital from developing countries.

## LITERATURE

1. Slavin, S. L. (1996). *Macroeconomics*, fourth edition. Irwin McGraw-Hill.
2. Burda, M., Viplo, C. (2004). *Makroekonomija*. Centar za liberalno-demokratske studije, Beograd
3. Krueger, D. (2009). *Makroekonomija*. Sveučilište u Pensilvaniji.
4. <https://www.rzs.rs.ba/>
5. <https://www.stat.si/StatWeb/en>
6. <http://publikacije.stat.gov.rs/G2021/HTML/G20211148.html>
7. <https://www.dzs.hr/>
8. Global economy on firmer ground, but with divergent recoveries amid high uncertainty, retrieved 1. 6. 2021. sa: <https://www.imf.org/en/Publications/WEO/Issues/2021/03/23/world-economic-outlook-april-2021>
9. World Economic Outlook Update January 2021, Policy Support and Vaccines Expected to Lift Activity, retrieved 20. 5. 2021. sa: <https://www.imf.org/en/Publications/WEO/Issues/2021/01/26/2021-world-economic-outlook-update>
10. World Economic Outlook, October 2020: A Long and Difficult Ascent, retrieved 15. 5. 2021. sa: <https://www.imf.org/en/Publications/WEO/Issues/2020/09/30/world-economic-outlook-october-2020>
11. The Global Economy: on Track for Strong but Uneven Growth as COVID-19 Still Weighs, retrieved 10. 6. 2021. sa: <https://www.worldbank.org/en/news/feature/2021/06/08/the-global-economy-on-track-for-strong-but-uneven-growth-as-covid-19-still-weighs>
12. Recovery plan for Europe, retrieved 19. 6. 2021. sa: [https://ec.europa.eu/info/strategy/recovery-plan-europe\\_en](https://ec.europa.eu/info/strategy/recovery-plan-europe_en)
13. Projekcije ekonomske aktivnosti u BiH u 2021. i 2022. godini korigovane naviše, retrieved 29. 5. 2021. sa: <https://www.cbbh.ba/press/ShowNews/1347>
14. Godišnji izveštaj o stabilnosti finansijskog sistema, retrieved 20. 6. 2021. sa: [https://nbs.rs/sr\\_RS/drugi-nivo-navigacije/publikacije-i-istrazivanja/GISFS/](https://nbs.rs/sr_RS/drugi-nivo-navigacije/publikacije-i-istrazivanja/GISFS/)
15. [www.europa.ba](http://www.europa.ba)
16. <https://ourworldindata.org/>

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Radovi se objavljuju pod uslovom da nisu prethodno objavljivani, niti je podnesen zahtjev za njihovo objavljivanje u nekom drugom časopisu. Radovi koji nisu adekvatno pripremljeni na osnovu ovog uputstva neće se uzimati u razmatranje.

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Rad treba da ima najviše do 15 strana A4 formata (između 15.0000 i 30.000 znakova).

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The full name of (all) authors, with a middle letter, is listed. The first and last names of domestic authors are always printed in their original form (with Serbian diacritics), regardless of the language of paper. Scientific and titular titles of the author in text for publication are not listed (for example, PhD).

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U opštem je interesu da se u naslovu koriste riječi prikladne za indeksiranje i pretraživanje. Ako takvih riječi nema u naslovu, poželjno je da se naslovu pridoda podnaslov. Naslov se ispisuje na dva jezika, i to:

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Podnaslovi se numerišu po nivoima, arapskim brojevima, po principu: *1. Prvi podnaslov, 2. Drugi podnaslov, 2.1. Prvi podnaslov drugog reda, 2.2. Drugi podnaslov drugog reda, 3. Treći podnaslov...* (poput strukture podnaslova korišćene u ovom uputstvu).

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Rezime je kratak informativan prikaz sadržaja članka koji čitaocu (ali i učesnicima u uređivačkom procesu) omogućava da brzo i tačno ocijeni njegovu relevantnost. U interesu je autora da sažeci sadrže termine koji se često koriste za indeksiranje i pretragu članaka. Sastavni dijelovi sažetka su cilj istraživanja, metodi, rezultati i zaključak.

Sažetak treba da ima od 100 do 200 riječi i treba da stoji:

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Tabelarni i grafički prikazi treba da budu dati na jednoobrazan način. Svaka tabela, grafikon ili slika moraju biti označeni brojem po redoslijedu navođenja u tekstu, s adekvatnim nazivom (npr.: *Tabela 2. Pouzdanost varijabli*).

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Napomene se daju pri dnu strane na kojoj se nalazi komentarisani dio teksta. Ne unose se „ručno“, već uz pomoć automatskih alatki za označavanje fusnota u konkretnom programu.



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in the attachment file, in two places - at the beginning of the paper (in the language in which the paper is written) and in the summary (in the language in which the summary is written).

#### 3.4.5. Subtitles

The subtitles are numbered by levels, using Arabic numerals, according to the principle: 1. First subtitle, 2. Second subtitle, 2.1. The first subtitle of the second order, 2.2. The second subtitle of the second order, 3. Third subtitle ... (like the subtitle structure used in this manual).

#### 3.4.6. Summary

The summary is a brief informative overview of the contents of the article that allows the reader (but also the participants in the editorial process) to quickly and accurately assess its relevance. It is in the author's interest that the summaries contain terms that are often used to index and search articles. The constituent parts of the summary are the aim of the research, the methods, the results and the conclusion.

The summary should contain from 100 to 200 words and should be in the attachment file, between titles and keywords.

The summary must be written in the same language as the paper. The summary does not contain references.

If the paper is in Serbian only, the summary should also be written in English as well. For the English summary, the author is responsible for grammatical and spelling accuracy. The scope of the summary can be up to 1/10 of the scope of the article.

#### 3.4.7. Keywords

Keywords are terms that best describe the content of the article for indexing and search purposes. They should be assigned with a reference to an international source (list, dictionary or thesaurus) that is most widely accepted within the given scientific field.

The number of keywords must not exceed eight.

Keywords are given in the language in which the paper is written and in the language in which the summary is written. In the article they are provided after the summary.

#### 3.4.8. Content of paper

The paper should be relevant to the scientific and professional public, written in accordance with IMRAD (Introduction, Method, Results and Discussion) by the presence of text organization with clearly stated goals, introduction, applied methods, research results, discussion, conclusion, references in the text and bibliographic units at the end. The ideas in the paper must be original and significantly contribute to the development of the subject of research, and the methodology must be clearly described.

#### 3.4.9. Tabular and graphic representations

Tabular and graphic representations should be presented in a uniform manner. Each table, chart, or image must have a number assigned according to the order in which they appear in the paper, with the appropriate title (for example: Table 2. Reliability of variables).

#### 3.4.10. Quoting

Quoting is a literal reference to others' discoveries, cognitions, theories, definitions, proofs, attitudes, theses, interpretations of opinions, data, and so on, their clear separation from author's, and the identification of the bibliographic source from which they originate.

Source of the quoted text is indicated in brackets at the place where it is located, by naming the author's surnames, the year of publication of the work and the page from which the quote was taken, and the quoted text is under quotation marks.

#### 3.4.11. Implicit citing (paraphrasing)

Implicit citing or paraphrasing is the transfer of discoveries, cognitions, theories, definitions, proofs, attitudes, theses, interpretations of opinions, data, etc. of another author, not literally, as it is in the used source, but in author's own manner or own expressive style.

Paraphrased content must be cited clearly and credibly, but in the author's own style. The paraphrased text is not the same length as the original, it may be longer or shorter depending on the goal to be achieved, but it must preserve the essence of the source text.

Source of the paraphrased text is indicated in brackets at a place where it is located by stating the surname of the author and the year of publication of the work from which the text was taken.

#### 3.4.12. Notes (footnotes)

The notes are provided at the bottom of the page where the commented part of the text is located. They are not inserted "manually", but with the help of automatic tools in a specific program.

#### 3.4.13. Korišćeni izvori u radu

Izvori obuhvataju, po pravilu, bibliografske izvore (članke, monografije i sl.) i daje se isključivo u zasebnom odjeljku članka, u vidu liste referenci. Reference se ne prevode na jezik rada, niti se preslovljavaju.

Za različite vrste bibliografskih jedinica različito se navode bibliografski podaci. Treba poštovati pravila standarda APA, <http://www.apastyle.org/index.aspx>. Nestandardno, nepotpuno ili nedosljedno navođenje izvora jedan je od kriterijuma za objavljivanje članka u časopisu.

U spisku literature navode se samo reference koje je autor koristio pri izradi, abecednim redom po prezimenima autora ili naslovu citirane reference ukoliko se ona tretira kao anonimno djelo.

Ako publikacija ima više izdavača i/ili mjesta izdanja, navodi se samo prvi.

Nema nikakve potrebe navoditi seriju, biblioteku u kojoj je knjiga izdata (to važi i za sabrana/izabrana djela), niti prevodioca, ako je monografija prevedena.

Ako je relevantno istaći broj izdanja, on se navodi iza naslova, u zagradi.

#### 3.4.14. Prilog

U prilogu bi trebalo dati samo one opise materijala koji bi čitaocima bili korisni za razumijevanje, evaluiranje ili ponavljanje istraživanja.

### 3.5. Jezičke preporuke

Jezik rada treba da pripada naučnom stilu standardnog jezika i da, stoga, bude usaglašen u što je moguće većoj mjeri s pravopisnom, gramatičkom i stilskom normom.

Individualne skraćenice bi trebalo izbjegavati, a ako se koriste, moraju biti raščitane pri prvoj upotrebi.

#### *3.4.13. The sources used in the paper*

Sources include, as a rule, bibliographic sources (articles, monographs, etc.) and are listed exclusively in a separate section of the article, in the form of a list of references. References are not translated into the language of the paper, nor is their letter changed.

Bibliographic data is listed differently for different types of bibliographic units. APA rules must be respected, <http://www.apastyle.org/index.aspx>. Non-standard, incomplete or inconsistent source guidance is one of the criteria for disregarding the article.

Only the references used by the author are listed in the literature list, in the alphabetical order of the author's surnames or the sources' titles, for those that are treated as anonymous works.

If the publication has multiple publishers and / or publishing sites, only the first one is listed.

There is no need to indicate the series, the library in which the book was issued (this also applies to the collected / selected papers), nor the translator, if the monograph is translated.

If it is relevant to indicate the issue number, it is listed behind the title, in brackets.

#### *3.4.14. Attachment*

Attachments should only provide descriptions of materials that would be useful for readers to understand, evaluate or repeat the research.

### **3.5. Language recommendations**

The language of paper should belong to the scientific style of the standard language and, therefore, be as harmonized as possible with spelling, grammatical and stylistic norms.

Individual abbreviations should be avoided, and if they are used, they must be explained at first use.

