

Gordana Đuranović

OTP banka Srbija
University Singidunum
Belgrade

Sanja Filipović

Institute of Social Sciences
University Singidunum
Belgrade

THE IMPACT OF THE EXTERNAL FACTORS ON THE PROFITABILITY OF THE BANKING SECTOR IN SERBIA

Uticaj eksternih faktora na profitabilnost bankarskog sektora u Srbiji

Abstract

The aim of the paper is to determine whether the measures of the National Bank of Serbia (NBS) contributed to the profitability of the Serbian banking sector before and during the crisis caused by two external shocks, the COVID-19 pandemic and the energy crisis triggered by the Russian-Ukrainian conflict. Profitability was analyzed for the whole Serbian banking sector in the period 2019- 3Q2024, using following ratios as a measure of profitability: return on assets (ROA), return on equity (ROE), net interest gain to total revenue, net fees and commissions gain to total revenue (net fees and commissions income ratio), and net pre-tax profit/loss to total revenue ratio (net pre-tax profit margin), comparing and explaining changes in growth during the observed period. Additionally, to improve research, the Capital adequacy ratio (CAR) and non-performing loans rate (NPL) are included in the analysis, and results show their significant impact on profitability. NPL rate is 2.7% at the end of the period, while CAR is 21.9%, and both values refer to the good quality of the credit portfolio. Results of research showed that the profitability is high with the tendency to grow in the future as well, because external shocks were successfully amortized and profitability increased significantly at the end of the observed period compared to 2019 as a reference year before the beginning of the crisis, which indicates stable bank operations, good cost control and successful credit risk management.

Keywords: *profitability, NPL, financial crisis, ROA, ROE, CAR, profitability indicators*

Sažetak

Cilj ovog rada je da utvrdi da li su mere NBS doprinele profitabilnosti srpskog bankarskog sektora pre i u toku krize uzrokovane eksternim šokovima, pandemijom virusa Covid- 19 i energetsom krizom kao posledicom rusko-ukrajinskog konflikta. Profitabilnost je analizirana za ceo srpski bankarski sektor u periodu od 2019- 3Q2024 godine, uz primenu različitih indikatora :stopa prinosa na imovinu (ROA), stopa prinosa na kapital (ROE), stopa neto dobiti od kamata, stopa neto dobiti od naknada i provizija i stopa neto dobiti pre oporezivanja, upoređivanjem i objašnjavanjem promena u rastu vrednosti ovih pokazatelja tokom posmatranog perioda. Dodatno su radi poboljšanja istraživanja u analizu uključeni i pokazatelj adekvatnosti kapitala (PAK), i stopa neperformansnih kredita (NPL rate), a rezultati su pokazali da imaju značajan uticaj na profitabilnost. Stopa NPL je 2,7% na kraju perioda, dok je PAK 21,9%, i obe vrednosti su pokazatelj dobrog kvaliteta kreditnog portfolija. Rezultati istraživanja otkrivaju da je profitabilnost visoka sa tendencijom rasta i u budućnosti jer su eksterni šokovi uspešno amortizovani i profitabilnost je značajno povećana na kraju posmatranog perioda u odnosu na 2019. godinu kao referentnu godinu pre početka krize, što ukazuje na stabilno poslovanje banaka, dobru kontrolu troškova i uspešnom menadžmentu kreditnih rizika.

Ključne reči: *profitabilnost, problematični krediti, finansijska kriza, ROA, ROE, PAK, indikatori profitabilnosti*

Introduction

After a brief recovery from the global financial crisis, the global economy experienced a renewed slowdown due to the consequences of the COVID-19 pandemic, which brought about substantial changes in lifestyle and business practices [11]. Shortly afterward, following the outbreak of the Russian-Ukrainian conflict, an energy crisis ensued, leading to widespread inflation due to rising food and crude oil prices [33]. European economies were especially affected - not only by inflation but also by interruptions in energy supply from the Russian Federation, disruptions in trade flows and supply chains, and rising budget deficits [7]. The external shocks caused by the pandemic, geopolitical tensions, and the energy crisis had a profound impact not only on corporate operations but also on consumer behavior. This significantly influenced the banking sector, which is directly dependent on the financial stability of its clients - both companies and individuals - forcing it to adapt its operations and risk management strategies under conditions of heightened uncertainty. During the pandemic, central banks and governments implemented a series of support measures such as interest rate reductions, liquidity injections, and credit guarantees to facilitate access to capital for both companies and consumers [16]. The European Central Bank (ECB) responded by launching several monetary measures, including the temporary Pandemic Emergency Purchase Programme (PEPP), expanded refinancing operations, and eased collateral requirements, among others. Governments across Europe enacted measures to support the economy, including reductions in the Value Added Tax (VAT), incentives for small and medium-sized enterprises, state-backed credit guarantees, and moratoriums on existing financial obligations. However, as inflation began to rise in 2022 due to the energy crisis, a shift in monetary policy occurred - public spending was curtailed, and a restrictive monetary approach was adopted [41].

Beginning in July 2022, the ECB gradually raised interest rates several times, reaching 4.25% by December 2023 [20]. In 2019, the profitability of European banks was relatively low, with return on equity (ROE) ranging from 6-7%. After a strong rebound in 2021, profitability began

to decline in 2022 [38], due to galloping inflation resulting from the energy crisis. Thanks to the ECB's measures, ROE increased to 8.1% by the end of 2022, 10.4% in 2023, and reached 11.1% by the third quarter of 2024.

The external shocks adversely affected the creditworthiness of businesses and households, leading to an increase in the rate of non-performing loans (NPL), which had previously been on a downward trajectory until the onset of the COVID-19 pandemic. Despite those adverse effects, the second half of 2021 marked a renewed decrease in NPL rate, driven by improving macroeconomic fundamentals [21].

According to the National Bank of Serbia (NBS), the banking sector in 2019 was relatively stable and generated a profit of 530 million euros. Due to the impact of the COVID-19 pandemic, profits declined to EUR 390 million. During the pandemic, the NBS implemented several measures—including interest rate cuts, credit moratoriums, and increased liquidity support—which contributed to profit recovery, reaching EUR 417 million in 2021.

As inflation began to rise in 2022 due to the energy crisis, the NBS, like the ECB, pursued a restrictive monetary policy. The banking sector posted a net profit of 742.4 million euros in 2022 and achieved a record profit of EUR 1 billion by the end of 2023. In 2024, the sector recorded an impressive increase, with profits reaching EUR 1.33 billion.

Banks generated EUR 2.2 billion from interest income and EUR 793.8 million from fees and commissions, underscoring the strong profitability of the sector.

The aim of this paper is to determine whether the measures undertaken by the NBS contributed to the profitability of the Serbian banking sector before and during the COVID-19 pandemic and the energy crisis. The structure of this paper is organized as follows: Section 1 is the introduction, Section 2 provides a literature review, while the methodological framework is presented in Section 3. Section 4 explains the measures taken to mitigate the effects of the COVID-19 pandemic and inflation in the EMU and the Serbian banking sector during the period from 2019 to the third quarter of 2024. The results of the research and discussion are presented in Section 5. Finally, concluding remarks are presented in Section 6.

Literature review

The existing literature contains numerous empirical studies examining the effects of policy measures implemented during the COVID-19 pandemic on bank profitability. For example, a study covering 269 commercial banks in 27 European Union (EU) countries between 2014 and 2022 found that these measures had a positive short-term impact on ROA, but in the long term, such interventions negatively affected banking profitability. This is because government subsidies reduce the need for businesses to borrow, decreasing bank income from interest and financial services [5].

A study that included 5,474 banks across 23 OECD countries demonstrated that a 1% increase in new COVID-19 cases reduced overall bank profitability by 0.31%, due to a 0.24% decline in net interest income and a 0.06% reduction in non-interest income. However, the same study found that following the rollout of vaccines, profitability improved regardless of new infection rates [1].

A study conducted in Croatia revealed that the COVID-19 pandemic led to a rise in expected credit losses in several banks, and as a result, the profitability of the Croatian banking sector dropped significantly due to decreased income and increased provisions for bad loans. In 2020, bank profits in Croatia were 53.1% lower compared to 2019, consistent with trends observed across the EU [23].

In Saudi Arabia, an analysis of ten banks between the first quarter of 2015 and the second quarter of 2023 assessed profitability using ROA and ROE indicators. The study evaluated the influence of independent variables such as capital adequacy, operational efficiency, deposit levels, bank size, and country-specific factors (including inflation and GDP), with the pandemic treated as a management factor. Results showed that bank-specific variables had a significant inverse relationship with profitability, while country-specific variables showed less direct correlation. The pandemic was a particularly significant variable in the relationship between operational efficiency and ROA and ROE, with a negative effect [13].

An analysis of banks listed on the Johannesburg Stock Exchange examined the impact of the COVID-19 pandemic on profitability, returns, and liquidity. Using panel

regression, the study found that the pandemic negatively affected both profitability and liquidity, although excess equity returns remained stable [34].

Several studies have aimed to assess the effects of the Russian-Ukrainian war on global banking markets. One such study analyzed 2,316 commercial banks across six continents and tracked stock performance across 90 exchanges between January 2020 and April 2021. The study applied both a market model and an abnormal return model to assess changes in banking stock returns before and after the war's declaration. Findings revealed a significant market return drop of 1.5% on the day the war began, with Europe recording the sharpest decline at 4%, attributed to its heavy dependence on Russian energy and robust trade relations with the warring nations. The study concluded that shifts in bank stock returns closely mirrored fluctuations in oil prices and exchange rates. From a behavioral finance perspective, investors' exaggerated reactions contributed to adverse market conditions [6].

A study involving 175 banks from the Eurozone during the 2013–2023 period investigated how geopolitical developments influence banking profitability. Using a baseline regression model with control variables such as asset return, equity return, and net interest margins, the analysis demonstrated that increases in the standard deviation of geopolitical risk generally reduce profitability. However, this negative effect diminishes at higher risk levels, suggesting a nonlinear relationship. The study also found that perceived threats had a stronger impact on profitability measures than actual events. Threats were associated with increased ROA and ROE and positively influenced net interest margins (NIM), implying that banks adjust their business strategies to mitigate potential risks [39]. A separate study examining the effects of the Russian-Ukrainian conflict on Poland's banking sector found that short-term impacts were neutral, but long-term consequences included negative effects on performance, capital, and liquidity of commercial banks [4].

Empirical research on the effects of external shocks on the profitability of the Serbian banking sector remains limited. One study analyzing all banks operating from 2004 to 2011 identified that internal factors such as liquidity,

bank size, and market concentration had a significant impact on profitability, while macroeconomic variables did not show substantial influence. Foreign-owned banks demonstrated greater resilience than domestic banks, and compared to the EU, liquidity and financial development indicators had either a negative or neutral effect, indicating institutional and structural disparities [24]. At the sectoral level, an analysis of the effects of the global economic crisis from 2008 to 2012 was conducted, focusing not only on the entire sector but also on the performance of the 15 largest banks to determine which factors contributed to declining profitability. The key profitability indicators included ROA, ROE, Net Interest Gain Margin (NIGM), net fee income ratio, and pre-tax profit margin, with an additional analysis of interest rate dynamics. The results showed that increased operating costs, particularly write-offs of non-performing loans, were the main contributors to reduced profitability. The medium-term profitability outlook was deemed weak [26].

A study covering all Serbian banks from 2019 to the end of Q3 2022 found that the banking sector remained profitable, though profitability decreased during crisis periods and was concentrated among a few banks with the largest assets. This positive outcome was attributed to prudent monetary policy, adherence to banking regulations, and Basel standards [35]. Additionally, research using linear regression to assess the impact of NPLs on profitability (measured by ROA and ROE) revealed that increasing NPL ratios did not have a statistically significant negative effect on profitability [25]. However, this impact was mitigated by regulatory measures and state support during the pandemic.

Unlike previous studies that focused on traditional profitability indicators (e.g., ROA, ROE, net interest margin, fee income ratio, and pre-tax margin), this paper examines the influence of external factors on banking profitability in Serbia for the 2019–3Q2024 period by also considering the impact of capital adequacy ratio (CAR) and NPL rates. This approach allows a better understanding of the connection between profitability, portfolio quality, and regulatory capital, contributing to insights into the sector's resilience in times of crisis.

Methodological Framework for Research

Bank profitability is influenced by numerous factors, including both external (macroeconomic) and internal (operational efficiency) variables [8]. This study analyzes the profitability of the Serbian banking sector using internal performance indicators such as ROA, ROE, net interest gain to total revenue, net fees and commissions gain to total revenue, and net pre-tax profit/loss to total revenue ratio.

To calculate profitability indicators, data were extracted from balance sheets and income statements, including pre-tax profit, total assets and equity at the beginning and end of the period, interest income and expenses, and fee income and expenses.

Total revenue was computed as the sum of business, financial, and other income. ROA is calculated as the ratio of net pre-tax profit to average total assets [26]. This indicator measures how efficiently assets are used and is expressed by the following formula:

$$ROA = \frac{\text{net pretax profit}}{(\text{total assets at the beginning of the period} + \text{total assets at the end of the period}) : 2}$$

ROE is calculated as the ratio of net pre-tax profit to average total equity [26] and reflects how effectively shareholder equity is utilized:

$$ROE = \frac{\text{net pretax profit}}{(\text{total equity at the beginning of the period} + \text{total equity at the end of the period}) : 2}$$

Although net income is commonly used in ROA and ROE calculations, this paper employs net pre-tax profit to better reflect the potential for asset and equity returns in the banking sector. All results are multiplied by 100% for interpretability.

The Net Interest Margin (NIM) – also referred to as Net Interest Gain Margin (though the term Net Interest Margin is more commonly used in the literature) – is an indicator of the profitability of a bank's interest-related operations. It measures how much a bank earns from the difference between interest income and interest expenses to its total income. It is calculated using the following formula:

$$\text{net interest gain margin} = \frac{(\text{interest income} - \text{interest expense})}{\text{total revenue}} * 100\%$$

The net fee and commission income ratio (NFCI) is calculated by subtracting fee and commission expenses from income, dividing the result by total revenue, and multiplying by 100%. The formula is as follows:

$$\text{net fees and commissions gain margin} = \frac{(\text{fees and commissions income} - \text{fees and commissions expense})}{\text{total revenue}} * 100\%$$

The net pre-tax profit margin is calculated by dividing pre-tax profit by total revenue and multiplying by 100%. This is expressed as:

$$\text{net pretax profit margin} = \frac{\text{net pretax profit}}{\text{total revenue}} * 100\%$$

In addition, CAR and NPL rates were analyzed to determine their effects on banking sector profitability. The capital adequacy ratio is an internationally recognized banking standard designed to manage credit risk [22]. It represents the ratio between bank capital and risk-weighted assets and must be maintained at a minimum of 8% [29]. The NPL ratio is one of the key indicators of credit portfolio quality, as it represents the share of non-performing loans (NPLs) in a bank's total credit portfolio. The National Bank of Serbia (NBS), in its Decision on the Classification of Balance Sheet Assets and Off-Balance Sheet Items of a Bank, uses the term problem loans and defines them as:

“The total outstanding debt of an individual loan (including the overdue amount):

- for which the borrower is in arrears, in accordance with the provisions of this decision, for more than 90 days, either in principal or interest payments;
- for which interest in the amount of at least three months' worth (or more) has been added to the debt, capitalized, refinanced, or its payment deferred;
- for which the borrower is less than 90 days overdue, but the bank has assessed that the borrower's ability to repay the debt has deteriorated and full repayment is in doubt” [30].

To calculate ROA, ROE, and NIGM for the entire Serbian banking sector, a weighted average was used instead of the arithmetic mean of the individual results of commercial banks, taking into account the size of each

bank, as banks of different sizes impact the sector's results differently. To calculate the sector's ROA, the total pre-tax net profit of all banks was divided by the total assets of all banks. For ROE, the total pre-tax net profit of all banks was divided by the total equity of all banks. Thus, the formulas are structured as follows:

$$\text{ROA sector} = \frac{\Sigma \text{ Net pretax profit}}{(\Sigma \text{ total assets at the beginning of the period} + \Sigma \text{ total assets at the end of the period}) : 2}$$

$$\text{ROE sector} = \frac{\Sigma \text{ Net pretax profit}}{(\Sigma \text{ total equity at the beginning of the period} + \Sigma \text{ total equity at the end of the period}) : 2}$$

NIGM is calculated by subtracting total interest expenses from total interest income and dividing the result by the total assets of all banks in the sector.

$$\text{NIGM sector} = \text{net interest gain margin} = \frac{(\Sigma \text{ interest income} - \Sigma \text{ interest expense})}{\Sigma (\text{total revenue})} * 100\%$$

NFCI is calculated as the ratio of net fee and commission income of all banks to the total assets of all banks. Net fee and commission income is obtained by deducting the total fee and commission expenses of all banks from the total fee and commission income of all banks in the sector.

$$\text{NFCI sector} = \frac{(\Sigma \text{ fees and commissions income} - \Sigma \text{ fees and commissions expense})}{\Sigma (\text{total revenue})} * 100\%$$

The pre-tax net profit margin for the banking sector is obtained by multiplying the ratio of the total pre-tax net profit of all banks to the total assets of all banks by 100, in order to express the result as a percentage.

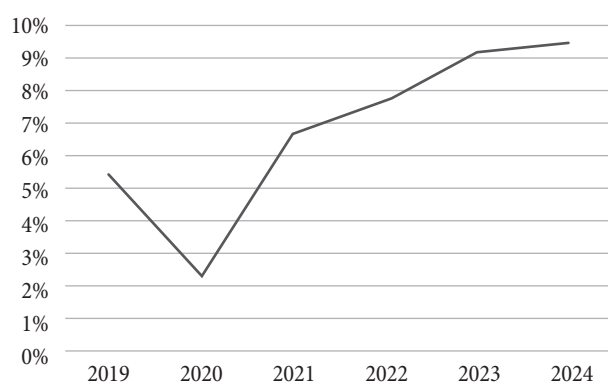
$$\text{Net Pre-Tax Profit Margin sector} = \frac{\Sigma (\text{Net profit before tax})}{\Sigma (\text{Total revenue})} * 100\%$$

EMU and Serbian banking sector in the period 2019-2024

As the financial performance of banks in the eurozone improved significantly in 2021 and exceeded pre-pandemic levels—due to lower credit loss provisions—it can be assumed that ECB measures were effective (Figure 1). Return on equity increased to 6.6%, up from 1.7% the year before [17]. In 2023, profitability reached levels not seen in

15 years, driven by rising interest income [18]. Although most banks experienced a decline in net interest income in 2024, profitability remained high, with ROE at 9.4% in Q2. Analysts predict a decline in EU banking sector profitability by 1.4 points by 2026 [19].

Figure 1: Return on equity in European banks, in %



Source: Data from ECB Financial Stability Reviews

The good performance of eurozone banks was a result of careful risk management and the ECB's 2017 guidelines on non-performing loans [15], as well as compliance with final EBA guidelines on risk management which refer to risk management through additional strategies, retention strategies, portfolio reduction, change in the type of exposed collateral, and legal options [14]. In response to inflation from the energy crisis, the ECB raised interest rates and reduced liquidity in the second half of 2022 [2], continuing monetary tightening in 2023. Inflation in the EMU dropped from 8.6% in January 2023 to 2.9% in December, targeting 2% in future periods [3]. In 2024, the ECB began easing with rate cuts from 4% to 3%, as inflation fell to 2.4%.

Efforts were also made to reduce NPLs, so in April 2020, to mitigate the consequences of the pandemic, the EBA published the "Guidelines on legislative and non-legislative moratoria on loan repayments (EBA/GL/2020/02)" to extend the repayment terms and reduce the potential mass of non-performing loans. To achieve this, a comprehensive set of measures and numerous strategies was implemented [12].

In Serbia, the NBS adopted the 'Strategy for Resolving Problematic Loans' in 2015, which laid a solid foundation for preserving financial stability during the COVID-19 crisis. Key measures during the pandemic included interest

rate cuts, credit moratoria, debt restructuring, and state-guaranteed loan schemes [10].

On May 7, 2020, the NBS Executive Board passed regulations delaying by six months the application of disincentive measures for new non-purpose and non-investment foreign currency loans. Adjustments were also made to capital adequacy regulations, internal risk management policies, and bank reporting obligations. These steps aimed to minimize the negative effects of the pandemic, release operational capacity, and enhance liquidity for the real sector during and immediately after the state of emergency [31].

On December 14, 2020, the NBS adopted Decision on temporary measures to facilitate proper credit risk management during the pandemic [31]. These measures included extending repayment deadlines, increasing flexibility for write-offs and loan restructuring, and supporting maintaining bank liquidity. As a result, a surge in NPLs was avoided, business continuity was preserved, and the financial system remained stable. In 2021, the NBS maintained low interest rates to stimulate credit activity and support the economy, ensured exchange rate stability for the dinar against the euro, and implemented liquidity-enhancing measures such as repo operations and other monetary instruments [27].

The main threat to financial stability in 2022 was surging inflation, which reached 15.1% (annual average), compared to 7.9% in 2021 and 1.3% in 2020. In response, the NBS began raising its key policy rate, accumulated foreign exchange reserves to strengthen stability, and promoted dinar-denominated transactions to reduce foreign currency exposure [27].

At the end of 2023, the average inflation rate decreased to 7.6%, and further dropped to 4.3% by the end of 2024. In addition to the combined measures of monetary policy, this decline was also significantly influenced by the easing of global cost pressures and favorable results in the agricultural sector. To preserve the stability of the dinar exchange rate against the euro, a record net purchase of foreign currency was achieved in the amount of EUR 3.9 billion. The National Bank of Serbia (NBS) adopted a decision to temporarily limit the nominal interest rate on housing loans with variable interest rates—up to an

amount of EUR 200,000—to 4.08% for a period of 15 months, starting from the October installment. This measure aimed to protect borrowers from rising interest rates [28]. As inflationary pressures decreased in 2024, the NBS reduced interest rates on dinar loans and a record growth in foreign currency savings was recorded. In June 2024, the NBS decided to reduce the key policy rate by 25 basis points, bringing it to 6.25%. This decision was made in the context of declining inflation and its return within the target tolerance band. In December, the NBS adopted another decision to temporarily cap interest rates, whereby the nominal interest rate on existing and new housing loans with variable rates was limited to 5%, while for new loans with fixed interest rates, the rate could not exceed 5%. This measure was introduced to protect financial service users and will remain in force until the adoption of the new Law on the Protection of Financial Service Users, or no later than the end of 2025. The results of the business policy implemented by the NBS were evident, as the banking sector preserved financial stability during the observed period despite external shocks and achieved significant profits, with a continued upward trend.

Table 1 presents a comparative overview of end-of-year inflation rates and key policy rates for the EU and Serbia. It clearly shows that the EU experienced lower inflationary pressures before 2021, while Serbia began to feel them as early as the end of 2021. During 2022, inflation in Serbia reached 15.1%, significantly higher than the EU's 8.4%. Regarding the key policy rate, the NBS responded earlier and more gradually, whereas the ECB delayed rate hikes until mid-2022 but applied a more aggressive tightening pace. As of September 30, 2024, inflation in the EU had declined to 1.8%, nearing the target. In Serbia, however,

Table 1: Comparative analysis of end-of-year inflation rates and reference interest rates: Serbia and EMU

	Inflation (Serbia) %	Reference interest rate (NBS) %	Inflation (EMU) %	Reference interest rate (ECB MRO) %
31.12.2019	1.9	2.25	1.2	0
31.12.2020	1.6	1	0.3	0
31.12.2021	7.9	1	2.6	0
31.12.2022	15.1	5	8.4	2.5
31.12.2023	7.6	5.25	5.4	4.5
30.09.2024	5.7	5.75	1.8	3.65

Source: Data from NBS and ECB reports

inflation remained higher at 5.7%, prompting the NBS to maintain a more restrictive monetary policy, resulting in a key policy rate of 5.75%.

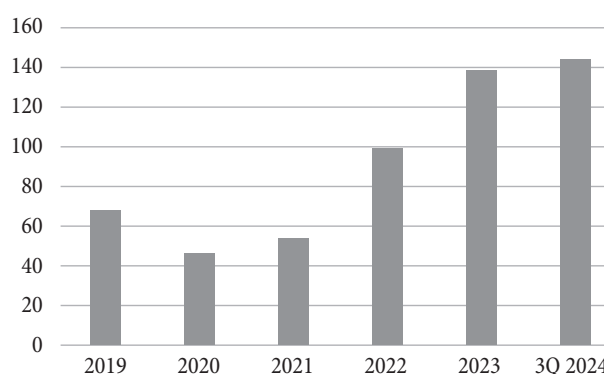
The results of the measures undertaken by the NBS were also reflected in the financial performance of banks, as illustrated in Figure 2. Compared to 2019, which can be considered the reference pre-crisis year, financial results were weaker in 2020 and 2021 [40]. However, despite the Russia-Ukraine conflict, 2022 saw a sharp increase, with pre-tax profits reaching RSD 99.62 billion, exceeding the 2019 level. In the third quarter of 2024, pre-tax profit amounted to as much as RSD 143.1 billion.

In 2019, 22 banks operated profitably, while 4 recorded losses. A trend of profit concentration is evident - seven banks with the highest net profit accounted for 86% of the sector's total profit. In 2020, 19 banks posted positive results, with the top five accounting for 81% of total banking sector profit, while 7 banks operated at a loss. In 2021, 20 banks were profitable and 3 recorded losses. During 2022, 20 banks recorded profits and only one operated at a loss. The trend of profit concentration continued year after year, remaining in the hands of the five largest banks. In both 2023 and 2024, only one bank operated at a loss.

Empirical Results and Discussion

The profitability of the Serbian banking sector was measured using ROA and ROE ratios. To obtain a more comprehensive picture, the net interest margin, net fee and commission income ratio, and net pre-tax profit

Figure 2: Net pre tax profit of the Serbian banking sector, in RSD billion



Source: Data from NBS annual reports and balance sheets of commercial banks

margin were also calculated. The analysis included both the profitability of each individual commercial bank and the banking sector as a whole. In addition to sector-wide indicator values, individual figures for commercial banks in Serbia at the end of the observed period will also be presented, especially since total bank assets significantly increased due to numerous mergers. This was particularly evident with OTP Bank Srbija a.d., which merged with Société Générale Bank a.d., and NLB Komercijalna Bank, which through the acquisition of Komercijalna Bank a.d. became the fifth largest bank. An overview of commercial banks in Serbia ranked by total assets as of September 30, 2024, in RSD million, is provided in Table 2.

Return on Assets and Return on Equity Ratios

ROA and ROE, as indicators of profitability, recorded their sharpest decline in 2020 (Table 3). In the following year, their values increased, indicating a sectoral recovery, but only in 2022 did these indicators return to and surpass pre-crisis levels. In 2023, growth continued despite a new wave of crisis, and the Serbian banking sector achieved record results. However, in 2024, both indicators declined. These results suggest moderate profitability in the banking sector. ROE values above 12.5% are considered good performance

Table 2: Total assets as of September 30, 2024, in RSD million

Bank name	Amount in RSD
1 Banca Intesa	986,398,862
2 OTP Bank Serbia	892,167,165
3 Raiffeisen Bank	717,372,743
4 Unicredit Bank	701,204,769
5 NLB Komercijalna Bank	622,591,085
6 Poštanska štedionica Bank	517,000,326
7 AIK Bank	452,136,894
8 Erste Bank	398,538,339
9 Eurobank Direktna	288,156,554
10 ProCredit Bank	167,512,965
11 Halk Bank	132,718,995
12 Alta Bank	107,446,470
13 Addiko Bank	104,618,997
14 Serbian Bank	55,499,009
15 Bank of China	41,835,984
16 Mobi Bank Belgrade	39,730,967
17 3 Bank Belgrade (Opportunity)	32,912,799
18 Adriatic Bank	26,149,742
19 API Bank	18,901,182
20 Mirabank	5,401,447

Source: National Bank of Serbia – Balance sheets of commercial banks

[38], and the ROA of the Serbian banking sector is also excellent, as ROA values range between 1% and 3%.

The individual results achieved by commercial banks are relatively uniform (Figure 3), revolving around the sector-wide ROA value at the end of the observed period, which amounts to 2.33%, except API Bank, which recorded an exceptionally high ROA of 7.11%. Adriatic Bank and Raiffeisen Bank also achieved significant results, while Mira Bank AD was the only one that did not record any ROA.

The ROE values for individual banks (Figure 4) are not as uniform as with the previous indicator. The reason for this lies in the disparity in bank sizes – larger banks tend to have lower ROE values due to higher regulatory capital requirements under Basel standards, higher operating costs, and lower efficiency, while medium and small banks show higher ROE levels due to greater flexibility and lower fixed costs. The highest return on equity was recorded by API Bank with 34.74% and Bank of China with 32.58%. Other banks significantly above the sector average of 16.10% at the end of the observed period include Adriatic Bank (28.86%), Raiffeisen Bank (28.67%), Srpska Bank (22.63%), and UniCredit Bank (21.57%). Mira Bank did not record a ROE due to the absence of operating profit.

Net interest gain to total revenue, net fees and commissions gain to total revenue, and net pre-tax profit/loss to total revenue ratio

The analysis of the net profit / loss to total revenue ratio, as one of the indicators of sector profitability, shows a positive net profit margin, indicating that the banking sector operated profitably during the observed period. In 2019, the value indicated stable operations and moderate profits (20–30% margin). In 2020 and 2021, the net profit margin slightly declined due to the financial crisis, but

Table 3: Return on assets and return on equity for Serbian commercial banks, in %

	ROA	ROE
2019	1.80	10
2020	1.13	7
2021	1.30	9.10
2022	2.02	15
2023	2.46	18.10
3Q2024	2.33	16.10

Source: Authors' calculations based on data from the balance sheets of commercial banks

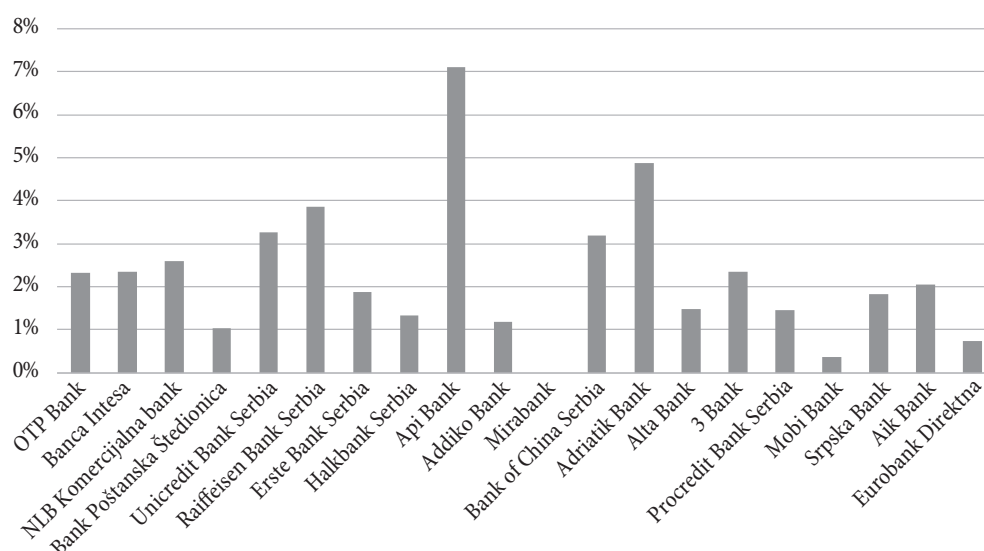
values still indicated moderate profit. However, in 2022, the indicator value returned to pre-pandemic levels, and in 2023 and 2024, it increased further, surpassing 2019 levels and showing high values that reflect above-average profitability.

The net interest profit margin followed a different trend – in 2019, it amounted to 52.83%, indicating that more than half of the profit stemmed from interest. In 2020, it rose to 59.90%, likely due to favorable financing conditions and NBS subsidies in response to the financial

crisis. It then dropped to 49.25% in 2021, with the lowest rate during the period being 43.06% in 2022. In 2023 and 2024, it rose again but did not reach the 2019 and 2020 levels, suggesting reduced credit disbursement as a result of rising inflation. Nevertheless, the overall result for the period, including 47.89% in 2024, indicates very high profitability and substantial interest income.

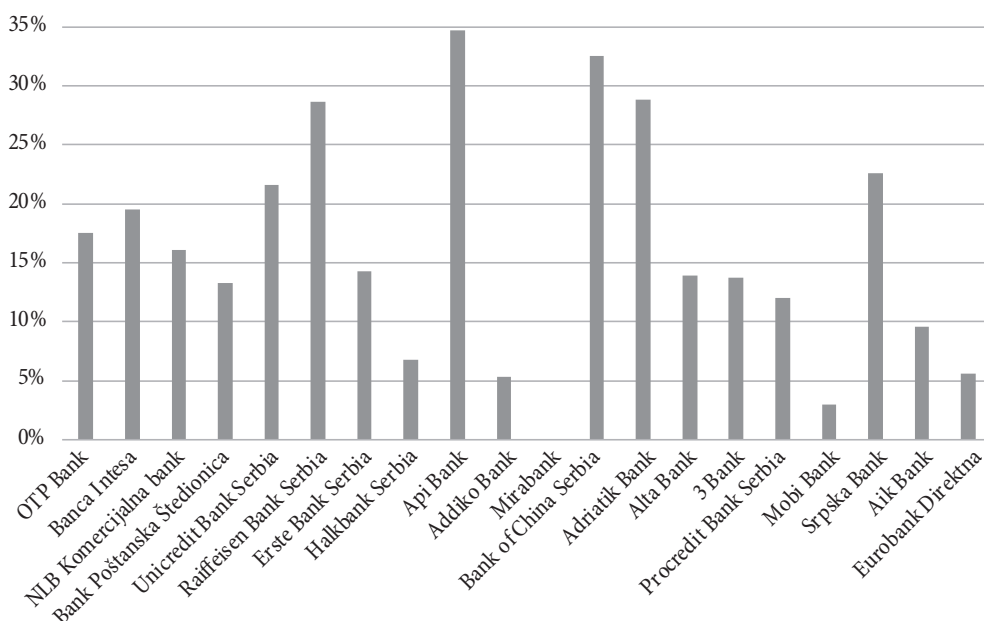
The net profit margin from fees and commissions shows a relatively modest share of income in 2019. In 2020, it grew to 19%, corresponding with the rise in net

Figure 3: Return on assets ratio for Serbian commercial banks at the end of the 3rd quarter of 2024, in %



Source: Authors' calculations based on data from the balance sheets of commercial banks

Figure 4: Return on equity ratio for Serbian commercial banks at the end of the 3rd quarter of 2024, in %



Source: Authors' calculations based on data from the balance sheets of commercial banks

interest profit and indicating increased service sales and better cost management. This margin continued to grow in 2021, reaching 21.10%. A decline occurred in 2022 by over one percentage point, falling further to 17.37% in 2023. However, a recovery was recorded in 2024, with a value of 19.77%. The 2024 result is solid and moderate, reflecting that the banking sector is efficient but still has room for improvement, particularly through digitalization and the development of fintech services, which are cheaper for the operational system. Values for all three profitability indicators are presented in Table 4.

Regarding net interest margin (Figure 5), commercial banks show fairly uniform results within the sector average, except for 3Bank AD with 73.20%, Mira Bank with 63.29%, followed by Srpska Bank (62.95%), Bank of China (61.57%), and NLB Komercijalna Bank AD (61.26%). Such high net

interest margins may indicate high profitability, but also reflect high spreads and insufficient investment.

On the other hand, some banks significantly deviate from the sector average in terms of the net profit margin from fees and commissions (Figure 6), with results ranging from 53.18% achieved by API Bank AD to only 0.01% by 3Bank AD at the end of Q3 2024. High net margins suggest highly rational cost management, possibly achieved through process automation and advanced digital services. The extremely low result of 0.01% by 3Bank suggests almost no revenue from fees and commissions, likely due to high infrastructure and personnel costs. When contrasted with the high 73.20% interest margin, it can be concluded that the bank's strategy focuses on attracting clients through favorable lending terms, making it dependent on interest income, which poses a risk to long-term sustainability. Generally, some banks have achieved significant digitalization and automation that leads to lower transaction costs [36], while others still struggle to implement new strategies.

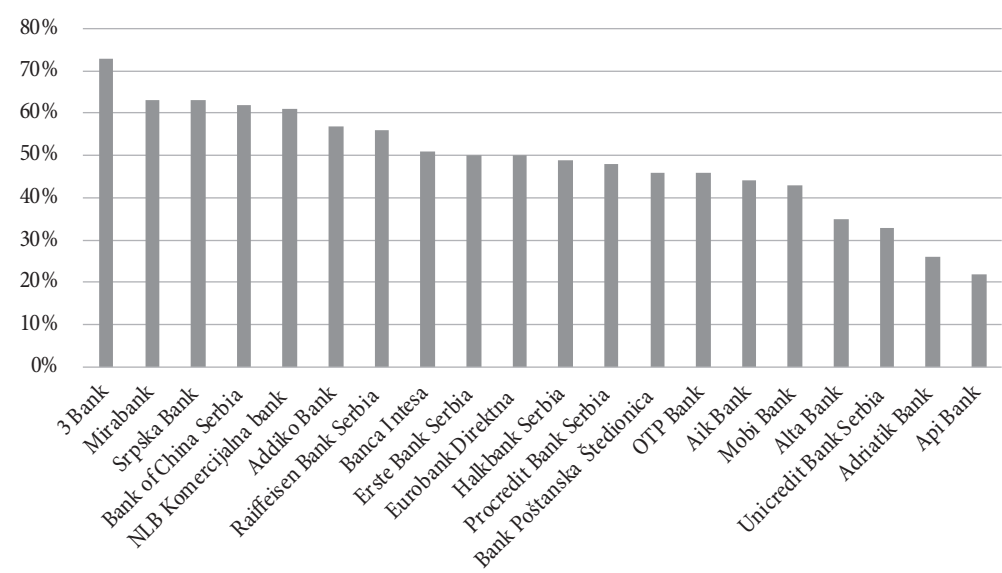
The net profit margin before tax (Figure 7) also shows considerable differences among banks, ranging from a high 70.3% by Bank of China to 0%, since Mira Bank was the only bank not operating profitably by Q3 2024. High profit margins exceeding the sector-wide 35.77% average at the end of the observed period were also achieved by Raiffeisen Bank (57.69%), API Bank (52.72%), Srpska Bank (44.90%), and NLB Komercijalna Bank (44.6%).

Table 4: Net interest gain to total revenue, net fees and commissions gain to total revenue, and net pre-tax gain profit/loss to total revenue ratio, in %

	Net interest gain to total revenue	Net fees and commissions to total revenue	Net pretax profit/loss to total revenue
2019	52.83	17	28.28
2020	59.90	19	22.74
2021	49.25	21.10	22.39
2022	43.60	20.20	28.95
2023	51.13	17.37	31.06
3Q2024	47.89	19.77	35.77

Source: Authors' calculations based on data from the balance sheets of commercial banks

Figure 5: Net interest gain to total revenue for commercial banks on 3rd quarter 2024, in %



Source: Authors' calculations based on data from the balance sheets of commercial banks

Interestingly, market leaders in asset size, lending, and market share – Intesa Bank and OTP Bank – are not the most profitable banks. Instead, they have moderate profitability levels in line with the banking industry's average. API Bank and Bank of China stand out as highly profitable, based on all profitability indicators, even though they rank 18th and 15th by asset size, respectively. This is a promising sign for their future growth.

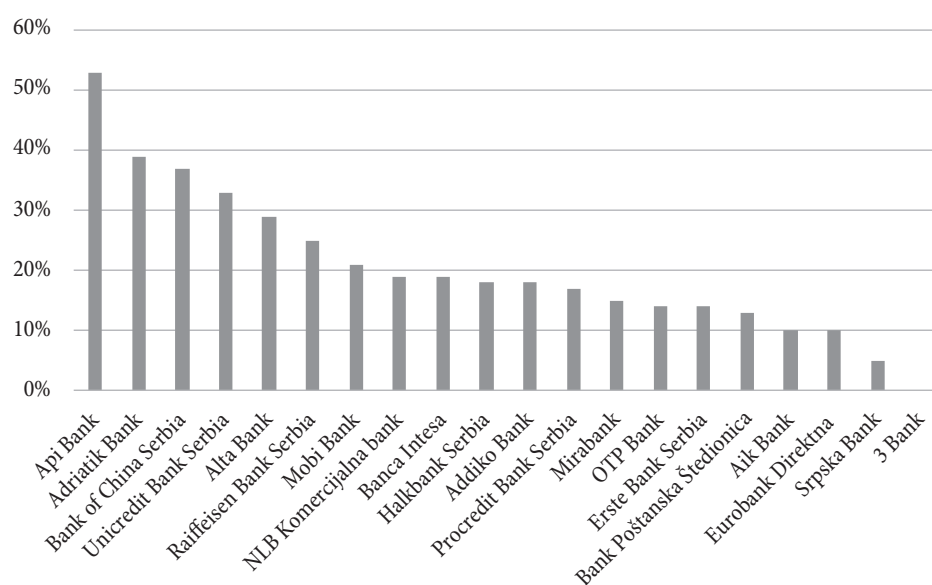
NPL and CAR

The influence of NPLs on profitability was also examined by monitoring the movement of the NPL rate (Figure 8).

An increase in the NPL rate significantly negatively affects profitability [42]. When the number of non-performing loans rises, profitability declines, as demonstrated in Serbia's banking sector, with the exception of 2020.

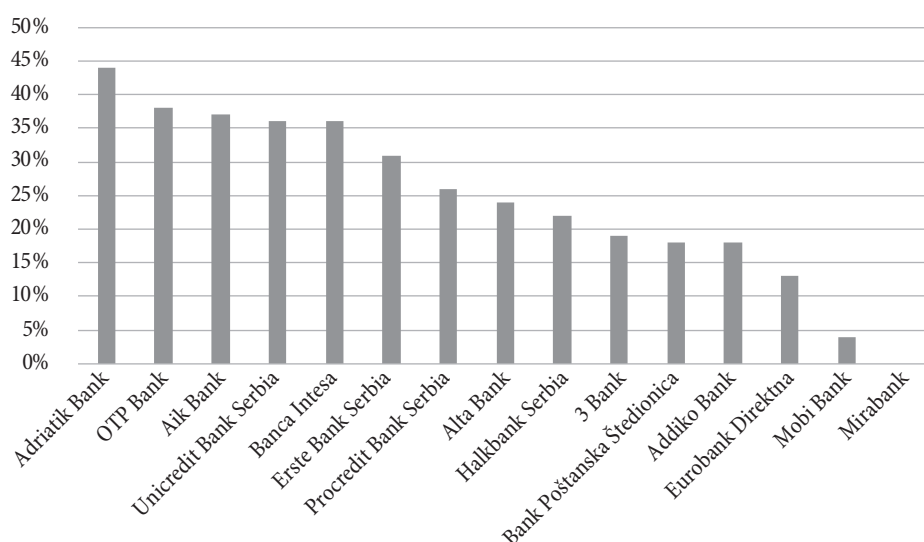
The NPL rate fell in 2020 compared to 2019, yet both ROA and ROE also declined, indicating that despite substantial efforts by the NBS and commercial banks to improve asset quality, profitability still decreased. This could be due to the write-off of uncollectible receivables and the sale of bad loans, which may not accurately reflect asset quality. Additionally, macroeconomic conditions and lower credit income likely contributed to reduced

Figure 6: Net fees and commissions gain to total revenue for commercial banks on 3rd quarter 2024, in %

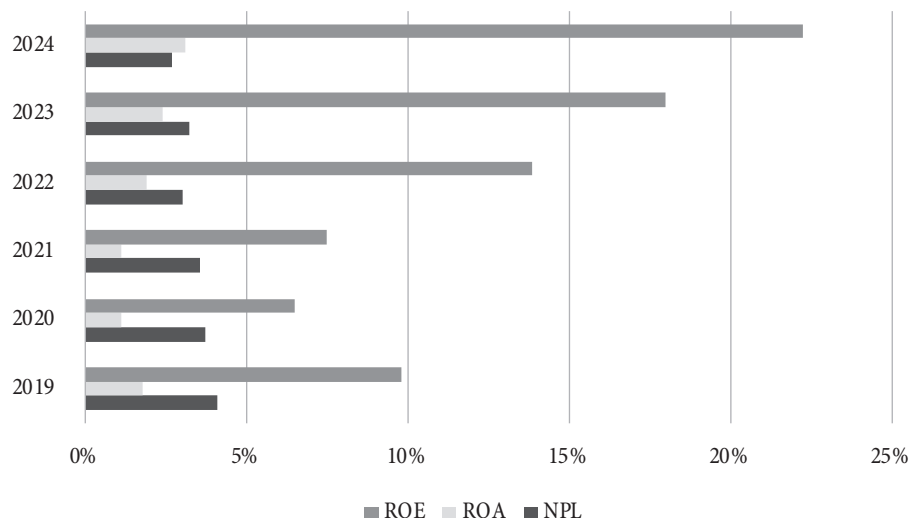


Source: Authors' calculations based on data from the balance sheets of commercial banks

Figure 7: Net profit margins for commercial banks on 3rd quarter 2024, in %



Source: Authors' calculations based on data from the balance sheets of commercial banks

Figure 8: Relationship of NPL with ROA and ROE in the Serbian banking sector, in %

Source: Authors' calculations based on data from the balance sheets of commercial banks

profitability. The further decline of the NPL rate to 3.6% in 2021 led to increased profitability, as lower provisioning means higher shareholder returns. Banks not only became more efficient but also improved their return on equity. The NPL rate continued to drop to 3% in 2020, and a slight increase to 3.2% had no significant impact on profitability. The final 2.7% rate at the end of the period is considered low and coincides with high ROA and ROE values.

On the other hand, as noted by Đaković, Milenković, & Andrašić, we assumed that capital adequacy positively affects profitability growth [9]. However, in Serbia's banking sector, the positive effect appears in the long term, while the short-term impact during the observed period was negative.

Table 5: Relationship of CAR with ROA and ROE in the Serbian banking sector, in %

	CAR	ROA	ROE
2019	23.4	1.8	9.8
2020	22.4	1.1	6.5
2021	20.8	1.1	7.5
2022	20.2	1.9	13.8
2023	21.4	2.4	18.0
2024	21.9	3.1	22.2

Source: NBS

CAR dropped in 2020 compared to 2019, immediately resulting in reduced ROA and ROE (Table 5). However, CAR growth in 2023 and 2024 had a notably positive impact on ROA and ROE. An exception to this trend occurred in 2020 and 2021, when profitability indicators rose despite

declining CAR values, likely due to increased lending or leverage. Lower provisioning needs indicate improved credit portfolios, corroborated by the drop in the NPL rate. Freed-up funds previously reserved for risk coverage contributed directly to profitability along with improved interest margins and fee income.

In conclusion, from 2019 to 2022, declining CAR had a positive impact on short-term profitability. From 2022 to Q3 2024, the increasing CAR negatively affected short-term profitability but positively contributed to long-term stability. Hence, the long-term effect is positive.

Conclusions

Profitability indicators show that the banking sector in Serbia is profitable and efficient. The high profitability of Serbia's banking sector during the observed period, except 2020 and 2021, indicates stable operations despite challenges, good cost control, and effective credit risk management, which helped absorb external shocks. Profitability increased significantly by the end of the period compared to 2019, used as the reference year before the crisis.

ROA of 2.33% and a ROE of 16.10% at the end of the third quarter of 2024 indicate high operational efficiency, a low level of NPLs, and elevated interest income, as reflected in the net interest margin (NIM) of 47.89% and net fee and commission income ratio (NFIR) of 19.77%. A net profit margin of 35.77% also indicates

high profitability and efficiency and aligns with other profitability indicators, confirming the banking sector's strong capacity to generate profits and manage resources, costs, and challenges effectively.

The NPL ratio of 2.7% at the end of the observed period indicates good credit portfolio quality, which is also confirmed by the capital adequacy ratio (CAR) of 21.9%. The research showed that the NPL ratio harms profitability and that profitability decreases as NPL increases. On the other hand, an increase in capital adequacy, i.e., provisioning, has a short-term negative effect on profitability indicators but strengthens financial security in the long term, contributing positively.

Based on the presented results, there is a tendency for profitability to increase in the future, given the successful implementation of the National Bank of Serbia's policies and excellent risk management during the crisis period.

This research provides a comprehensive analysis of the impact of the COVID-19 pandemic and the Russia-Ukraine conflict on the profitability of Serbia's banking sector, using a broad set of indicators (ROA, ROE, NIM, NFIR, NPL, and CAR). Unlike previous studies that focused exclusively on the effects of the global financial crisis, this paper covers complex contemporary shocks and their reflection on the operational and regulatory resilience of banks. The results can serve policymakers, banking managers, and researchers as an empirical basis for assessing the resilience of the banking system and creating crisis strategies.

Although banks are required to identify, assess, and manage all material and immaterial risks they are exposed to international standards and guidelines such as the Basel Standards, the disruption trends in the banking market caused by the COVID-19 pandemic and the Russia-Ukraine conflict indicate the need for more detailed regulation of bank clients exposure to geopolitical risks within the framework of operational risks. This would allow such external shocks to be more easily mitigated, so future research should focus on a broader macroeconomic context. At the same time, to increase efficiency, it is recommended to digitize almost all work processes where feasible and to automate them in order to optimize costs and further increase profits.

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Gordana Đuranović

is a Senior Advisor for Corporate Loan Collection at OTP Bank and a PhD candidate at the University Singidunum. In her current role, she is responsible for representing the bank in proceedings related to the collection and restructuring of corporate non-performing loans (NPLs). Her work encompasses credit risk assessment, debt settlement negotiation, legal coordination, and strategic restructuring, with a focus on preserving asset quality and maintaining financial discipline within the banking sector. She holds a BSc degree from the Faculty of Law, University of Belgrade, while MSc degree was obtained in Business Economics. Her multidisciplinary academic background enables her to bridge practical challenges in banking operations with broader economic and institutional frameworks. Gordana has authored several scientific papers in the field of banking sector performance, credit market structure, and financial regulation. Her research combines real-world experience in banking with academic insight, contributing to the understanding of banking sector competitiveness, the impact of non-performing loans, and the harmonization of national financial regulation with EU standards.



Sanja Filipović

is a Principal Research Fellow at the Institute of Social Sciences and a Full Professor at the University Singidunum, where she teaches Economics, International Economics, and Advanced Macroeconomics. She finished PhD and MSc studies at the University of Belgrade, Faculty of Economics. Her research areas encompass a broad range of topics within economic policy, macroeconomic analysis, and international economics. She participated as a researcher or project manager in numerous high-profile domestic and international research projects, notably including those under the Science Fund of the Republic of Serbia, Horizon, Erasmus, GIZ, and OECD, among others. She published six books, 25 scientific papers in top international scientific journals, and more than 100 papers in national and international scientific journals. Besides, she is co-author of "Macroeconomic Analyses and Trends – MAT", a unique monthly publication in macroeconomic research. In 2024, she was declared the most prominent academic in social sciences by the Ministry of Science and Technological Development, Republic of Serbia.