UDK:
005.52:336.717(497.11)
336.763:336.781.5

MACROECONOMIC AND BANK-SPECIFIC DETERMINANTS OF NET INTEREST MARGINS: EVIDENCE FROM SERBIA

Mirjana Jemović[1], Srđan Marinković[2], Kristijan Ristić[3], Andreja Todorović[4]

doi: 10.59864/Oditor 22601MJ Original Article

Abstract

This paper examines the determinants of the net interest margin (NIM) of banks in Serbia during the period 2007–2023. The analysis includes indicators reflecting banking-sector conditions and selected macroeconomic variables as independent variables, while NIM is treated as the dependent variable. Using panel regression analysis, the study identifies the key determinants affecting the net interest margin of banks operating in the Republic of Serbia. The results indicate that macroeconomic factors significantly influence NIM. The key policy interest rate has a positive effect, while the exchange rate has a negative effect on NIM. Among banking sector variables, bank size and the loan-to-deposit ratio show a statistically significant negative impact, whereas the Lerner index, as a measure of market power, has a positive effect. Other variables are not statistically significant.

Key words*: determinants, net interest margin, banks, Republic of Serbia*
JEL*: G21, E43*

---

[1] Mirjana Jemović, PhD, Associate Professor, University of Niš, Faculty of Economics, Trg Kralja Aleksandra Ujedinitelja 11, Niš, Serbia, E-mail: mirjana.jemovic@eknfak.ni.ac.rs; ORCID: 0000-0002-5212-182X. The paper is the result of research conducted under the Agreement on the Transfer of Funds for Financing R&D Activities in 2026 (Reference Number 451-03-34/2026-03) between the Ministry of Science, Technological Development and Innovation of the Republic of Serbia and the Faculty of Economics, University of Niš.

[2] Srđan Marinković, PhD, Full Professor, University of Niš, Faculty of Economics, Trg Kralja Aleksandra Ujedinitelja 11, Niš, Serbia, E-mail: srdjan.marinkovic@eknfak.ni.ac.rs; ORCID: 0000-0001-9012-9454. The paper is the result of research conducted under the Agreement on the Transfer of Funds for Financing R&D Activities in 2026 (Reference Number 451-03-34/2026-03) between the Ministry of Science, Technological Development and Innovation of the Republic of Serbia and the Faculty of Economics, University of Niš.

[3] Kristijan Ristić, PhD, Full Professor, MB University, Belgrade, Teodora Drajzera br. 27, Belgrade, Serbia, E-mail: kristijanristic.fpim@yahoo.com; ORCID: 0000-0001-8907-1304.

[4] Andreja Todorović, Associate Researcher, University of Niš Innovation Centre, Serbia, E-mail: andrejatod@gmail.com; ORCID: 0000-0003-2849-6987.

Introduction

Net interest margin (NIM) is a widely used measure of bank profitability, defined as the ratio between net interest income and selected categories of assets reported in the balance sheet of an individual bank or the banking sector as a whole. When data availability is not a limitation, NIM can alternatively be expressed as the ratio of the aforementioned difference to interest-earning assets, which more accurately reflects the efficiency of the banking industry related to traditional credit-deposit intermediation. However, due to data constraints, research in practice more commonly defines NIM in relation to total assets.

Net interest margin indicates the efficiency of asset and liability management. Moreover, it serves as an indicator of the broader economic and regulatory situation in which banks operate. Understanding the factors that influence net interest margin is essential for decision makers, regulators and financial institutions themselves, especially in conditions of high interest rate volatility.

Determinants of NIM can be internal, which reflect banks' operations, and external, which reflect the macroeconomic and institutional environment (Nuhiu et al., 2024; Kosumi & Zharku, 2024; Rossi et al., 2024). Despite the extensive literature on this topic, differences in identified determinants among countries and regions point to the need for deeper analyses that take into account the specific characteristics of national banking sectors. This paper examines the key factors that shape banks' net interest margins in the Republic of Serbia, using panel regression analysis.

The domestic banking sector has had important structural changes in the past decades, including the process of transition, privatization and adaptation to the EU's regulatory framework. Furthermore, due to the coordinated reaction to global economic disturbances, part of this period was also marked by unusually low interest rates. In such an environment, the analysis of factors affecting net interest margin gains additional importance. Special emphasis will be on the time span after the global financial crisis to analyze the resilience and adaptation of banks under conditions of reduced profitability, environmental change, and regulatory demands. Research results can help understand the margin structure in the Serbian institutional context and provide a basis for policies aimed at improving the banking system's efficiency and stability. The paper includes three main parts. The first is a literature review on the determinants of net interest margin. This is followed by the data analysis, a detailed description of the methodology, and a discussion of results. The final section offers concluding considerations.

Literature review

The determinants of banks' net interest margin have been the subject of numerous theoretical and empirical studies, given the importance of this indicator for assessing the profitability and efficiency of the banking sector. The basic theoretical model for analyzing the net interest margin was developed by Ho and Saunders (1981). This model (known as the dealership model) sees the bank as an intermediary between depositors and borrowers, attempting to avoid exposure to risk as much as possible. It is assumed that in choosing the structure of its loans and the sources of funding for those loans, the bank aims to insulate (isolate) itself from the effects of risk—this is known as the hedging hypothesis. The underlying assumption is that aligning the weighted average maturities of financial assets and liabilities allows banks to avoid potential reinvestment and refinancing risks that would otherwise result from differences in their respective maturity profiles. The risk identified by the model is the interest rate risk arising from changes in interest rates. Liquidity risk—which can be a practical consequence of maturity mismatches between assets and liabilities—is not specifically analyzed, as the model assumes that reinvestment and refinancing will always be available, albeit under suboptimal conditions. Thus, liquidity risk is essentially reduced to interest rate risk. To give the model a more elegant mathematical form, simplifications were necessary, and many of the risks that banks face in practice were abstracted from the model.

Net interest margin points to the bank's operational efficiency and the impact of competition on two traditional banking markets: the deposit and loan markets. To a large extent, NIM is a parameter that the bank sets as its target when they want to cover all the risks and costs that arise in financial intermediation (Obeid, 2024). Banks pursue target efficiency by applying various business strategies. One way is to operate with the maximum possible spread between lending and deposit interest rates. Nonetheless, competition limits banks' ability to increase operational efficiency in this way. Therefore, it can be concluded that NIM optimization is nothing more than the response of each individual bank to prevailing market conditions. The level of NIM is influenced by both interest rate policy and the structure of assets and liabilities available to the bank, with a mutual interdependence existing between these two factors.

Maintaining an adequate net interest margin is essential for generating income that allows banks to build up capital buffers in response to higher risk exposure. (Angbazo, 1997, p. 56). For that reason, in empirical research on net interest margins, various determinants pointing to the degree of risk exposure often appear as potentially statistically significant. These include, for example, credit

risk (Wong, 1997; Angbazo, 1997), liquidity risk, the degree of financial leverage, operating costs, bank size, non-interest income, and others.

Banks set the margins taking into account the following factors: level of risk aversion and market competition, bank size and interest rate volatility. Many studies employ cross-country samples to explore whether common factors influence margin formation across different banking systems.Table (1) shows the studies relevant for this paper.

Table 1. Review of empirical studies

Papers	Research sample	Main determinants	Key contribution
Saunders & Schumacher (2000)	6 developed and 6 developing countries, 1988-1995, bank-as-intermediary model	Regulatory factors, market structure, risk	Risk is a key determinant of NIM; margins are higher in countries with less stable financial systems
Drakos (2002)	Central and Eastern Europe, 1993-1999, DEA and regression	Efficiency, foreign bank entry, concentration	Foreign bank entry reduces NIM in transitional economies
Maudos & Fernández de Guevara (2004)	EU (15 countries), 1993-2000, panel regression	Operating costs, competition, risks	Decline in European banking system margins due to reduced interest rate risk, credit risk, and operating costs, despite increased market power and concentration
Claeys & Vander Vennet (2008)	Central and Eastern Europe vs. Western Europe, 1993-2000, panel regression	Competition, ownership, costs, capital	An increase in competition and the inflow of foreign capital tend to reduce the net interest margin (NIM) Increased competition and foreign capital entry reduce NIM
Hawtrey & Liang (2008)	OECD, 1989-2001, panel regression	Risk, bank size, competition	Greater competition and bank size reduce margins, while risk increases it
Männasoo (2013)	Estonia, 1998-2011, panel regression	Efficiency, competition, risk, bank size	Greater competition and efficiency reduce margins; risk and operating costs increase it
Marinković & Radović (2014)	Serbia, 2008-2012, panel regression	Ownership structure, bank size, credit risk	Banks with a higher equity-to-assets ratio have higher NIM, while credit risk is in

			negative correlation with NIM
Plakalović & Alihodžić (2015)	Bosnia and Herzegovina, 2008-2013, multiple linear regression	GDP, inflation, liquidity risk, credit risk	Economic expansion reduces NIM, while liquidity, credit risk and operating costs increase NIM
Ganić (2018)	Southeast Europe, 2006-2015, panel regression	Inflation, GDP, credit growth, capital	Inflation and credit growth increase NIM, GDP growth decreases NIM
Bustos-Contell et al. (2019)	Banks in the EU, 2000–2015, panel regression	Credit risk, capitalization, inflation, GDP growth, competition	Before the crisis, macroeconomic factors had more influence; after the crisis, risk and capitalization became more significant
Todorović et al. (2024)	Southeast Europe, 2012–2021, OLS regression	Exchange rate, interest rate, concentration, sector size	Domestic currency depreciation, interest rate growth, concentration and sector size lead to higher NIM

Empirical literature differs in geographical focus and methodological approach. However, most papers single out similar groups of determinants: selected features of the national banking system, macroeconomic and institutional determinants. So, the most commonly used are: bank size (larger banks often achieve lower margins due to economies of scale), efficiency (higher operational efficiency is associated with lower costs and higher margins), credit risk (higher risk requires a higher premium embedded in interest rates), and the structure of funding sources (banks that rely more on expensive sources of capital tend to have higher margins). Among macroeconomic and institutional variables, the most frequently cited determinants of NIM include: inflation (higher inflation often leads to higher margins due to a greater uncertainty premium), gross domestic product (higher economic activity usually contributes to lower margins as credit risk and unit service costs decrease), regulatory framework and the degree of financial liberalization (more restrictive regulation can increase operating costs and affect margins), and market structure, i.e., the level of competition (in oligopolistic structures, banks have the ability to set higher margins, while the presence of foreign banks can increase competition and reduce margins of domestic banks) (Ristić et al., 2023).

Recent studies have continued to explore the determinants of net interest margins in the context of prolonged low interest rate environments and structural changes in banking systems. For instance, Borio et al. (2017) and

Claessens et al. (2018) emphasize the role of monetary policy conditions and bank business models in shaping interest margins. More recent research highlights the importance of market power, regulatory environment and macroeconomic volatility for margin formation in both developed and emerging banking systems.

Männasoo (2013) analyzes the determinants influencing the NIM of banks in Estonia from 1998 to 2011. The independent variables are: market structure, interest rate volatility, efficiency, liquidity, and credit risk. The research results confirmed that NIM is primarily determined by risk and the market structure of the banking sector. Bustos-Contell et al. (2019) conduct a study to identify the determinants of NIM for banks operating in Spain from 1985 to 2015. The analysis confirm that macroeconomic determinants have a more significant impact before the crisis, while industry-specific determinants are more influential after the crisis.

Among papers analyzing the determinants of net interest margin of banks operating in several countries, we single out research by Saunders & Schumacher (2000) who use a sample of 614 banks operating in six selected European countries and the USA from 1988 to 1995. The results show that regulatory factors, such as limits on deposit interest rates, required reserves and capital adequacy ratios, have a significant impact on NIM. Also, segmentation and restrictions within the banking system increase the existing banks' monopoly power, leading to higher margins. Macroeconomic volatility of interest rates also significantly affects NIM, suggesting that policies aimed at reducing that volatility may reduce bank margins. Drakos (2002) examines the banking sector's efficiency in Central and Eastern European countries during the transition period and analyzes the impact of foreign bank entry on net interest margins. The analysis covers 185 banks from transition countries, including Bulgaria, the Czech Republic, Hungary, Poland, Romania and Slovakia, in the period from 1993 to 1999. The results of the panel analysis show that foreign bank entry decreased NIM in the observed transition countries during the analyzed period.

Maudos & Fernández de Guevara (2004) examine the factors influencing net interest margins in major European Union banking markets over the period 1993–2000. They find that operating costs and risk levels played a significant role. Despite widespread mergers and acquisitions during this time, reductions in operational costs and lower interest and credit risks offset the potential increase in NIM, suggesting that market structure and competition alone could not fully explain changes in NIM.

Hawtrey and Liang (2008) examine the determinants of net interest margins across the banking sectors of fourteen OECD countries over the period 1987–2001. Their results indicate that both bank scale and managerial performance exert a significant negative influence on NIM, whereas factors such as market power, risk aversion, interest rate volatility, credit risk, the opportunity cost of holding liquid assets and implicit interest have a positive and significant effect. Managerial efficiency is defined as the ratio of operating expenses to gross income, where lower efficiency corresponds to narrower margins. Bank size is measured as the logarithm of total loan volume, where larger loan portfolios reduce unit costs due to economies of scale, ultimately resulting in narrower interest margins.

Kasman et al. (2010) conducted the analysis on a sample of selected countries from Central and Eastern Europe between 1995 and 2006. Their study compares banks in countries that recently joined the EU, such as Malta and Cyprus, with banks operating in candidate countries including Croatia, Macedonia, and Turkey. The authors intend to check the impact of consolidation of the banking sector, and thus distinguish two observation periods: the first, from 1995 to 2000, and the second, from 2001 to 2006. In the first analyzed period, most industry-specific and market variables confirm a positive impact on NIM. In the second period, the influence of macroeconomic variables diminished due to reduced disparities among the analyzed countries, which led to an increased importance of industry-specific variables. Among them, capital adequacy confirms its significance in old, but not new, EU members, while the concentration index emerges as an important determinant of NIM in both sets of countries, although the effect operated in opposite directions.

In the context of Serbia and the Western Balkans, research is still relatively limited. Marinković and Radović (2014) analyze the determinants of net interest margin in the Serbian banking sector. They use panel regression analysis to check the influence of the characteristic features of individual banks, the banking sector and macroeconomic determinants on NIM, in the context of different ownership structures and bank sizes. The results indicate that macroeconomic determinants do not have a significant effect on the margin when banks operating within the same economic and institutional environment are considered as statistical units. When it comes to industry-specific variables, the analysis confirms that banks with a higher equity-to-assets ratio record higher net interest margins. Regarding the impact of credit risk, their research points to the the opposite, i.e. negative relationship with NIM. Of industry-specific indicators, market concentration is a significant factor, with the expected direction of influence. Additional importance of this paper comes from

the analysis of differences in NIM between banks of different sizes and ownership structures. The findings indicated that larger and foreign banks exhibit superior risk management efficiency. Plakalović and Alihodžić (2015) analyze the determinants of net interest margin of banks in Bosnia and Herzegovina from 2008 to 2013. Using a multiple linear regression model, the authors analyze the impact of macroeconomic and microeconomic determinants on NIM. Their findings confirm a negative relationship between macroeconomic determinants (gross domestic product growth and inflation) and net interest margin, while industry-specific variables (liquidity risk, credit risk and operating costs) confirm a positive relationship with NIM. Todorović et al. (2024) analyze the determinants of net interest margin in the banking sectors of Southeast Europe during the period from 2012 to 2021. Their results indicate that both the cost of capital in real terms and currency fluctuations, along with bank sector magnitude and degree of market concentration, are positively associated with NIM. In contrast, variables such as GDP, inflation, capitalization, liquidity and credit risk are found to have no statistically significant impact. In a somewhat different methodological framework, Marjanović et al. (2023) use DEA and the Tobit regression method in a similar period to look at banks in Serbia as statistical units, and find a negative impact of high market concentration of the banking sector, GDP and financial crisis, while inflation is a variable with a positive influence on bank efficiency.

Methodology and discussion

Given that the objective of this paper is to analyze the impact of the determinants of banks' net interest margin in the Republic of Serbia from 2007 to 2023, we focus on selected industry-specific and macroeconomic indicators (Table 2).

Table 2. Description of key indicators

Variable	Name	Definition
Net interest margin	nim	Ratio of net interest income and total assets
GDP per capita	gdppc	GDP per capita
Inflation	inflation	Year-on-year price growth
Exchange rate	exchangerate	Exchange rate change of RSD in relation to EUR
Interest rate	ris	Annual key policy interest rate of the NBS
Concentration in the banking sector	concentration	Herfindhal-Hirschman concentration index
Bank size	size	Logarithm of total assets
Credit risk	creditrisk	Ratio of nonperforming loans to total loans
Operational efficiency	oer	Ratio of operating expenses to operating income

Loan-to-deposit ratio	ldr	Ratio of total loans to total deposits
Lerner Index	lerner	(total income - total expenses) / total income
Asset provisions	assetprovisions	Ratio of provisions to total assets

The Lerner index is used as a proxy for banks' market power and reflects the ability of banks to set prices above their costs. Higher values of the index indicate greater market power and lower competitive pressure in the banking sector. In this study, the index is calculated using accounting data on banks' total income and total expenses, as presented in Table 2, which represents a commonly applied approach in empirical banking research.

The research sample includes 20 banks (n=20): 3 Banka, Addiko banka, Adriatic banka, AIK, ALTA, API, Banca Intesa, Bank of China Srbija, Poštanska štedionica, Erste Bank, Eurobank Direktna, Halkbank, MIRABANK, NLB Komercijalna banka, OTP, ProCredit Bank, Raiffeisen Banka, Srpska Banka, Unicredit Bank and Yettel Bank in the period from 2007 to 2023 (t=17). The panel is not balanced, as some banks do not have data for the entire time span. Data were obtained from the National Bank of Serbia's website. The following graph shows banks' net interest margin trend in the observed period.

Diagram 1: NIM trend in the selected Serbian banks in the period 2007-2023

Source: NBS, authors, https://www.nbs.rs/sr_RS/finansijske-institucije/banke/bilans-stanja (accessed on 10 April 2025)

Note: 1-3 Banka, 2-Addiko banka, 3-Adriatic banka, 4-AIK, 5-ALTA, 6-API, 7-Banca Intesa, 8-Bank of China Srbija, 9-Poštanska štedionica, 10-Erste Bank, 11-Eurobank Direktna, 12-Halkbank, 13-MIRABANK, 14-NLB Komercijalna banka, 15-OTP, 16-ProCredit Bank, 17-Raiffeisen Banka, 18-Srpska Banka, 19-Unicredit Bank i 20-Yettel Bank

The data analysis was conducted using Stata 12. Table 3 presents the descriptive statistics of the variables.

Table 3. Data summary

Variable		Mean	SD	Min	Max	N
nim	Overall	0.044	0.028	-0.061	0.138	321
	Between		0.021	0.007	0.113	20
	Within		0.019	-0.028	0.140	16.05
gdppc	Overall	6886.358	1494.143	5359.840	10895.180	321
	Between		300.878	6837.938	8059.419	20
	Within		1479.983	4767.933	10943.600	16.05
inflation	Overall	5.902	4.324	1.300	15.100	321
	Between		0.309	4.644	5.965	20
	Within		4.317	1.238	16.358	16.05
exchangerate	Overall	1.023	0.044	0.960	1.118	321
	Between		0.009	0.993	1.026	20
	Within		0.043	0.957	1.117	16.05
ris	Overall	6.751	4.371	1.000	17.750	321
	Between		1.120	3.179	6.941	20
	Within		4.299	0.810	17.751	16.05
concentration	Overall	765.100	109.249	578.000	986.000	321
	Between		26.720	760.235	852.429	20
	Within		107.608	582.864	990.864	16.05
size	Overall	17.861	1.421	14.342	20.646	321
	Between		1.335	15.531	19.993	20
	Within		0.638	15.698	20.138	16.05
creditrisk	Overall	1.080	19.070	0.000	340.629	319
	Between		4.481	0.001	20.050	20
	Within		18.531	-18.968	321.659	15.95
oer	Overall	0.052	0.048	0.009	0.560	321
	Between		0.025	0.019	0.126	20
	Within		0.041	-0.026	0.532	16.05
ldr	Overall	1.910	12.472	0.000	183.268	319
	Between		4.607	0.460	19.071	20
	Within		11.958	-16.573	173.483	15.95
lerner	Overall	-0.796	4.789	-67.491	3.197	315
	Between		2.246	-9.213	0.527	20
	Within		4.422	-63.954	6.550	15.75
assetprovisions	Overall	0.005	0.009	0.000	0.131	321
	Between		0.004	0.000	0.018	20
	Within		0.009	-0.012	0.119	16.05

Source: Authors

Certain variables exhibit relatively large ranges, particularly credit risk, loan-to-deposit ratio and the Lerner index. These extreme values may be attributed to

differences in banks' balance sheet structures, as well as to specific episodes during the observed period when some banks experienced unusually low profitability or temporary losses, which affected the calculated values of certain indicators.

With the aim of testing the impact of selected industry-specific and macroeconomic variables on NIM, we employ panel regression. The dependent variable is nim.

In our analysis, the Hausman test results ($\chi^2(6) = 3.44$, $p = 0.752$) fail to reject the null hypothesis, suggesting that the random-effects model is more suitable. The Breusch-Pagan LM test assesses whether there is no unit-specific variance, i.e. whether the simple OLS model adequately captures the data structure. The test outcome ($\chi^2(1) = 715.28$, $p < 0.001$) rejects the null hypothesis, confirming the presence of panel effects.

Model diagnostics involve several tests. The Fisher-type test indicates that GDP per capita (gdppc), inflation, exchange rate, concentration and size are non-stationary and therefore require first-order differencing. To assess residual normality, kurtosis and skewness tests for panel data are applied. The findings are summarized in Table 4.

Table 4. Test of normality of residuals

					95% confidence interval	
	Coefficient	**Bootstrap SE**	***z***	***p***	**Lower bound**	**Upper bound**
Skewness of errors	-3.38e-06	2.43e-06	-1.39	0.164	-8.13e-06	1.38e-06
Kurtosis of errors	5.17e-07	2.30e-07	2.25	0.025	6.62e-08	9.68e-07
Skewness of residuals	8.65e-06	6.53e-06	1.32	0.185	-4.15e-06	0.00002
Kurtosis of residuals	5.49e-07	3.63e-07	1.51	0.130	-1.62e-07	1.26e-06

Source: Authors

Analysis of the distribution characteristics of errors and residuals shows that there are no statistically significant deviations from symmetry ($p > 0.16$ for all skewness estimates). However, the kurtosis coefficient of the error term is positive (coefficient = 5.17e-07) and statistically significant ($p = 0.025$), which indicates that distribution of errors is more peaked than the normal distribution. The kurtosis of residuals is not statistically significant ($p = 0.130$), which shows that the residuals approximately follow a normal distribution.

The Wooldridge test for autocorrelation indicates the presence of serial dependence in the panel observations ($F(1, 19) = 10.294$, $p = 0.005$). The Breusch-Pagan/Cook-Weisberg test detects heteroskedasticity in the dataset ($\chi^2(20) = 9005.56$, $p < 0.001$). To assess potential multicollinearity, variance inflation factors (VIF) and tolerance values are calculated. All independent variables exhibit VIF values below 10 and tolerance values above 0.1, indicating no serious multicollinearity. Finally, cross-sectional dependence among banks is examined using the Pesaran test. The null hypothesis about the absence of cross-sectional dependence is not accepted ($CD = 4.622$, $p < 0.001$), which indicates dependence among banks. Based on the conducted tests, we opt for a random-effects model, and due to the interdependence between banks, we use Driscoll-Kraay estimator to correct standard errors. The Driscoll–Kraay estimator is applied in order to obtain robust standard errors that are consistent in the presence of heteroskedasticity, serial correlation and cross-sectional dependence. Since the diagnostic tests indicate the existence of autocorrelation, heteroskedasticity and cross-sectional dependence among banks, the Driscoll–Kraay correction provides more reliable inference compared to conventional random-effects estimators. Table 5 shows the results of the analysis.

Table 5. Random-effects GLS regression with Driscoll–Kraay standard errors

	***β* (95% CI)**	**SE**	***p***
dgdppc	-2.05e-06 (-4.62e-06, 5.14e-06)	1.20e-06	0.109
dinflation	-0.00025 (-0.00069, 0.00018)	0.00021	0.273
dexchangerate	-0.04727 (-0.06489, -0.02966)*	0.00826	<0.001
ris	0.00254 (0.00226, 0.00282)*	0.00013	<0.001
dconcentration	-0.00003 (-0.00008, 0.00002)	0.00002	0.248
dsize	-0.01295 (-0.02296, -0.00293)*	0.00470	0.015
creditrisk	–0.03812 (–0.17411, 0.09786)	0.06380	0.559
oer	0.04137 (–0.08465, 0.16739)	0.05913	0.495
ldr	-0.00002 (-0.00003, -2.74e-06)*	7.08e-06	0.024
lerner	0.00052 (0.00022, 0.00082)*	0.00014	0.002
assetprovisions	-0.12496 (-1.12398, 0.87405)	0.46870	0.793
const	0.02955 (0.02076, 0.03834)*	0.00412	<0.001
N	295		
$\chi^2(11)$	1904.86		
p	<0.001		
R^2	0.268		

*$p < 0.05$

Source: Authors

The regression equation is as follows:

$nim = 0.02955 - 2.05*10^{-6}*dgdppc - 0.00025*dinflation - 0.04727*dexchangerate + 0.00254*ris - 0.00003*dconcentration - 0.01295*dsize – 0.03812*creditrisk + 0.04137*oer - 0.00002*ldr + 0.00052*lerner - 0.12496*assetprovisions$

The model is significant ($\chi^2(11) = 1904.86$, $p < 0.001$). Together, the variables explain 26.8% of the variance in the dependent variable ($R^2 = 0.268$). Significant predictors of the dependent variable are: Exchange rate change (dexchangerate) ($\beta = -0.04727$, 95% CI = [-0.06489, -0.02966], $p < 0.001$); Key policy interest rate (ris) ($\beta = 0.00254$, 95% CI = [0.00226, 0.00282], $p < 0.001$); Change in bank size (dsize) ($\beta = -0.01295$, 95% CI = [-0.02296, -0.00293], $p = 0.020$); Loan-to-deposit ratio (ldr) ($\beta = -0.00002$, 95% CI = [-0.00003, -2.74e-06], $p = 0.020$) and Lerner Index (lerner) ($\beta = 0.00052$, 95% CI = [0.00022, 0.00082], $p = 0.002$).

It should be noted that several variables (GDP per capita, inflation, exchange rate, concentration and bank size) are included in the model in their first differences. Therefore, the coefficients of these variables reflect the effect of changes in these indicators on net interest margin rather than their absolute levels. The interpretations of the coefficients are as follows. A one-unit increase in the annual change of the exchange rate (dexchangerate) is associated with a decrease in net interest margin (NIM) of approximately 0.047, holding other variables constant. A one-percentage-point increase in the key policy interest rate (ris) is associated with an average increase in NIM of about 0.0025, ceteris paribus. A one-unit increase in the annual change of bank size (dsize) is associated with an average decline in NIM of approximately 0.0129, holding other factors constant. A one-unit increase in the loan-to-deposit ratio (ldr) is associated with a decrease in NIM of about 0.00002, other variables remaining unchanged. Finally, a one-unit increase in the Lerner index (lerner) is associated with an average increase in NIM of approximately 0.0005, holding other variables constant.

Conclusion

This study employs panel regression analysis to determine the main factors influencing the net interest margin (NIM) of Serbian banks during the analyzed period. The results confirm the significant impact of macroeconomic variables, i.e. key policy interest rate and exchange rate, on NIM. An increase in the key policy interest rate has a positive impact on net interest margin, which is in line with expectations: higher reference rates signal banks to increase lending interest rates, thereby increasing income from loan placement. On the other hand, the depreciation of the domestic currency (weakening of the dinar)

negatively affects the margin, which may be a consequence of high borrowing costs and higher exchange rate risk in the banking sector.

Among banking sector characteristics, bank size is negatively correlated with net interest margin, suggesting that larger banks have lower margins, potentially due to more intense competition and lower reliance on interest income. The loan-to-deposit ratio (ldr) also demonstrates a negative effect, indicating that greater exposure to lending relative to collected deposits may contribute to a decline in the margin, either through increased funding costs or higher levels of risk. Lerner index has a significant and positive impact on the margin, which confirms that banks with greater market power, i.e. the ability to influence market prices, achieve higher net interest margins. Contrary to expectations, other analyzed variables, such as inflation, concentration index, credit risk, operational efficiency and asset provisions for asset losses (loan loss provisions), do not show a statistically significant impact on net interest margin in the analyzed sample.

The findings have several policy implications. Monetary authorities should be aware that changes in the policy rate and exchange-rate movements materially affect banking-sector margins. For bank managers, the results suggest that balance-sheet structure and market positioning remain important drivers of profitability.

This study is subject to several limitations. The analysis covers only Serbian banks and selected explanatory variables, while institutional quality, ownership structure and broader regulatory changes were not explicitly modeled. Future research may extend the sample to regional comparisons and dynamic panel techniques.

References

1. Angbazo, L. 1997. Commercial bank net interest margin, default risk, interest-rate risk, and off-balance sheet banking. *Journal of Banking & Finance*, 21(1), 55–87.

2. Borio, C., Gambacorta, L., & Hofmann, B. 2015. The Influence of Monetary Policy on Bank Profitability. *BIS Working Papers*, 514. Basel: Bank for International Settlements.

3. Bustos-Contell, E., Climent-Serrano, S., & Labatut-Serer, G. 2020. Changes in determinants of the interest margin in today's economy. *Economic Research-Ekonomska Istraživanja*, 33(1), 3146–3165. https://doi.org/10.1080/1331677X.2019.1696693

4. Claeys, S., & Vander Vennet, R. 2008. Determinants of bank interest margins in Central and Eastern Europe: A comparison with the West. *Economic Systems*, 32(2), 197–216. https://doi.org/10.1016/j.ecosys.2007.04.001

5. Claessens, S., Coleman, N. & Donnelly, M. 2018. Low-for-long interest rates and banks' interest margins and profitability: Cross-country evidence. *Journal of Financial Intermediation*, 35 (Part A): 1–16. https://doi.org/10.1016/j.jfi.2017.05.004

6. Drakos, K. 2002. The efficiency of the banking sector in Central and Eastern Europe. *Russian and East European Finance and Trade*, 38(2), 31–43. http://www.jstor.org/stable/27749617

7. Ganić, M. 2018. An empirical analysis of factors affecting bank interest margins: Evidence from the South East European countries. *Comparative Economic Research*. *Central and Eastern Europe*, 21(2), 81–98. https://doi.org/10.2478/cer-2018-0013

8. Ho, T. S. Y., & Saunders, A. 1981. The determinants of bank interest margins: Theory and empirical evidence. *Journal of Financial and Quantitative Analysis*, 16(4), 581–600. https://doi.org/10.2307/2330377

9. Hawtrey, K., & Liang, H. 2008. Bank interest margins in OECD countries. *The North American Journal of Economics and Finance*, 19(3), 249–260. https://doi.org/10.1016/j.najef.2008.07.003

10. Kasman, A., Tunc, G., Vardar, G., & Okan, B. 2010. Consolidation and commercial bank net interest margins: Evidence from the old European Union members and candidate countries. *Economic Modelling*, 27(3), 648–655. https://doi.org/10.1016/j.econmod.2010.01.004

11. Kosumi, A., & Zharku, L. 2024. Bank-Specific, Economic and Legal Determinants of Profitability in the Republic of North Macedonia. *Access to Just. E. Eur.*, 212.

12. Männasoo, K. 2013. Determinants of bank interest spreads in Estonia. *Eastern European Economics*, 51(1), 36–60. https://doi.org/10.2753/EEE0012-8775510103

13. Marinković, S., & Radović, O. 2014. Bank net interest margin related to risk, ownership and size: An exploratory study of the Serbian banking industry. *Economic Research-Ekonomska Istraživanja*, 27(1), 134–154. https://doi.org/10.1080/1331677X.2014.952114

14. Marjanović, I., Stanković, J. & Tsaples, G. 2023. On the determinants of the bank efficiency in the Republic of Serbia: Two-stage DEA approach. *Economic Themes*, 61(2), 215–233.

15. Maudos, J., & Fernández de Guevara, J. 2004. Factors explaining the interest margin in the banking sectors of the European Union. *Journal of Banking & Finance*, 28(9), 2259–2281. https://doi.org/10.1016/j.jbankfin.2003.09.004

16. Nuhiu, A., Aliu, F., & Hoti, A. 2024. Assessing the determinants of bank interest rate spread: Evidence from Western Balkan countries. *SAGE Open*, 14(4), 21582440241301882. https://doi.org/10.1177/21582440241301882

17. Obeid, R. 2024. Factors affecting net interest margin in the banking sector: Evidence from the Arab region. *Journal of Governance & Regulation*, 13(1), 214–222. https://doi.org/10.22495/jgrv13i1art19

18. Plakalović, N., & Alihodžić, A. 2015. Determinants of the net interest margins in BH banks. *Industrij*a, 43(1), 133–153. https://doi.org/10.5937/industrija43-7544

19. Ristić, K., Živković, A., & Jemović, M. 2023. Politička ekonomija novca. *Oditor*, 9(1), 103–122. https://doi.org/10.5937/Oditor2301103R

20. Rossi, S., Barbieri, L., & Lippi, A. 2024. Determinants of the profitability and stability of euro area banks during the ice age of interest rates. *Rev. Eur. Stud.*, 16, 1.

21. Saunders, A., & Schumacher, L. 2000. The determinants of bank interest rate margins: An international study. *Journal of International Money and Finance*, 19(6), 813–832.

22. Todorović, A., Jemović, M., & Marinković, S. 2024. An analysis of the determinants of net interest margin of the banking sectors in Southeast European countries. *Economic Themes*, 62(2), 185–202.

23. Wong, K. P. 1997. On the determinants of bank interest margin under credit and interest rate risks. *Journal of Banking & Finance*, 21(2), 251–271.

MAKROEKONOMSKE I BANKARSKO-SPECIFIČNE DETERMINANTE NETO KAMATNIH MARŽI: EMPIRIJSKI DOKAZI IZ SRBIJE

Apstrakt

U radu se analiziraju determinante neto kamatne marže (NKM) banaka u Srbiji u periodu 2007–2023. U analizi se koriste pokazatelji koji odražavaju stanje u bankarskom sektoru i odabrane makroekonomske varijable kao nezavisne varijable, dok se NKM posmatra kao zavisna varijabla. Primenom panel regresione analize identifikovane su ključne determinante koje utiču na neto kamatnu maržu banaka koje posluju u Republici Srbiji. Rezultati pokazuju da makroekonomski faktori imaju značajan uticaj na NKM. Referentna kamatna stopa ima pozitivan uticaj, dok devizni kurs ima negativan uticaj na NKM. Među varijablama bankarskog sektora, veličina banke i odnos kredita i depozita imaju statistički značajan negativan uticaj, dok Lernerov indeks, kao mera tržišne moći, ima pozitivan uticaj. Ostale analizirane varijable nisu statistički značajne.

Ključne reči: *determinante, neto kamatna marža, banke, Republika Srbija*

JEL*: G21, E43*

Submission received: 28 October 2025 / Revised: 13 December 2025 / Revised: 9 March/ Accepted: 8 April 2026