Factors Related to Bank Profitability: A Comparative Study of Commercial Banks in Armenia and Georgia

Stepanyan Tehmine A.
PhD in Economics, Associate Professor, Chair of Financial Accounting,
Armenian State University of Economics (Yerevan, RA)
https://orcid.org/0000-0003-4737-5400
stepanyantehmine@gmail.com
Gharagyozyan Melanya A.
Lecturer, Chair of Macroeconomics,
Armenian State University of Economics (Yerevan, RA)
https://orcid.org/0000-0002-3087-699X
melanyagharag@gmail.com

UDC: 336; **EDN:** WFHYLR; **JEL:** E58, G21, G24
DOI: 10.58587/18292437-2026.5-283
Keywords and phrases: bank profitability, ROA, bank size, Loan portfolio growth, Armenia, Georgia, comparative analysis, correlation analysis

Բանկերի եկամտաբերության հետ կապված գործոնները. Հայաստանի և Վրաստանի առևտրային բանկերի համեմատական ուսումնասիրություն

Ստեփանյան Թեհմինե Ա.
տնտեսագիտության թեկնածու, դոցենտ, Ֆինանսական հաշվառման ամբիոն,
Հայաստանի պետական տնտեսագիտական համալսարան (Երևան, ՀՀ)
Ղարագյոզյան Մելանյա Ա.
դասախոս, Մակրոէկոնոմիկայի ամբիոն,
Հայաստանի պետական տնտեսագիտական համալսարան (Երևան, ՀՀ)

Ամփոփագիր. Հոդվածում ուսումնասիրվում է Հայաստանի և Վրաստանի առևտրային բանկերի ակտիվների եկամտաբերությունը և դրա կապը բանկի չափի, ակտիվների կառուցվածքի ու աճի տեմպերի հետ: Վերլուծությունը հիմնված է 2018–2024 թվականների 70 բանկ-տարի դիտարկումների վրա՝ երկու երկրներից հինգական բանկ: Վերլուծության համար կիրառվել են նկարագրական վիճակագրություն, Welch-ի t-թեստ, Mann–Whitney U թեստ, ինչպես նաև Pearson-ի և Spearman-ի կորելյացիոն գործակիցներ: Երկրների միջև կորելյացիաների տարբերությունները գնահատվել են Fisher-ի z-թեստով:
Արդյունքները ցույց են տալիս, որ Հայաստանի և Վրաստանի բանկերի միջին եկամտաբերության միջև վիճակագրորեն նշանակալի տարբերություն չի հայտնաբերվել: Միաժամանակ Վրաստանի բանկերում վարկային պորտֆելի աճի միջին տեմպն ավելի բարձր է եղել, քան Հայաստանի բանկերում: Բանկի չափի և ROA-ի միջև դրական և վիճակագրորեն նշանակալի կապ է արձանագրվել երկու երկրներում էլ (ՀՀ՝ r = 0.495, p = 0.0025, Վրաստան՝ r = 0.581, p = 0.0003): Վարկային պորտֆելի և ակտիվների աճի դեպքում դրական կապ նկատվել է հիմնականում Հայաստանի ընտրանքում, մինչդեռ Վրաստանի բանկերի համար նման կապ չի արձանագրվել: Հաշվի առնելով ընտրանքի փոքր ծավալը և բազմակի վիճակագրական թեստերի կիրառումը՝ ստացված արդյունքներ պետք է մեկնաբանել զգուշությամբ և չդիտարկել որպես պատճառահետևանքային կապերի ապացույց:
Հանգուցաբառեր և բառակապակցություններ՝ բանկային եկամտաբերություն, ROA, բանկի չափ, վարկային պորտֆելի աճ, Հայաստան, Վրաստան, համեմատական վերլուծություն, կորելյացիոն վերլուծություն

Факторы, влияющие на прибыльность банков: сравнительное исследование коммерческих банков Армении и Грузии

Степанян Термине А.
к.э.н., ассистент, кафедра финансового учета,
Армянский государственный экономический университет (Ереван, РА)
Карагезян Меланья А.
преподаватель, кафедра макроэкономики,
Армянский государственный экономический университет (Ереван, РА)

Аннотация. В статье рассматривается рентабельность активов коммерческих банков Армении и Грузии и ее взаимосвязь с размером банка, структурой активов и темпами роста. Анализ основан на 70 банковско-годовых

наблюдениях за 2018–2024 годы, по пять банков из каждой из двух стран. Для анализа использовались описательная статистика, t-критерий Уэлча, критерий Манна–Уитни, а также коэффициенты корреляции Пирсона и Спирмена. Различия в корреляциях между странами оценивались с помощью z-критерия Фишера.
Результаты показывают, что статистически значимой разницы между средней прибыльностью армянских и грузинских банков не обнаружено. В то же время средний темп роста кредитного портфеля в грузинских банках был выше, чем в армянских банках. В обеих странах была обнаружена положительная и статистически значимая взаимосвязь между размером банка и рентабельностью активов (ROA) (Армения: r = 0,495, p = 0,0025, Грузия: r = 0,581, p = 0,0003). В случае кредитного портфеля и роста активов положительная взаимосвязь наблюдалась преимущественно в армянской выборке, тогда как в грузинских банках такой взаимосвязи не было обнаружено. Учитывая небольшой размер выборки и использование множественных статистических тестов, результаты следует интерпретировать с осторожностью и не рассматривать как доказательство причинно-следственных связей.
Ключевые слова и словосочетания: прибыльность банка, ROA, рост кредитного портфеля, рост кредитования, Армения, Грузия, сравнительный анализ, корреляционный анализ

INTRODUCTION

Commercial banks play an important role in the financial system in transition economies. They provide lending, financial intermediation, and facilitate the distribution of financial resources between different sectors of the economy. Therefore, the effective operation of banks is important for both the stability of the banking system and economic development.

In 2018–2024, the financial systems of Armenia and Georgia operated in a rather volatile environment. This period includes the economic consequences of the COVID-19 pandemic, regional geopolitical developments, as well as the growth of capital and migration flows in both countries in 2022–2024. At the same time, the period under study fully covers the period of application of the IFRS 9 “Financial Instruments” standard, within the framework of which the Expected Credit Loss (ECL) model became one of the main tools for assessing and reserving credit risk.

In such conditions, it is important to understand which bank-specific internal factors are associated with its financial performance.

The aim of the study is to assess and compare the relationship between the return on assets (ROA) of five commercial banks in the sample of Armenia and Georgia with the size of the bank, the specific weight of fixed assets, the growth of the loan portfolio and the growth rate of assets.

The peculiarity of the study is that the banks of Armenia and Georgia are compared based on the same period of 2018–2024 and the same financial indicators. Five banks were selected from each country, which makes it possible to consider the results of the two countries within the framework of a comparable sample.

The next section presents the literature on the topic, after which the data and analysis methods are described. Then the results obtained are presented and discussed, and finally the main conclusions, limitations of the study and practical observations are summarized.

LITERATURE REVIEW

Factors related to bank profitability have long been studied in the field of banking economics. Despite the existence of numerous empirical works on the topic, there is still no unambiguous conclusion about the role of individual factors. The relationship of the same factors with bank profitability may vary in different countries and periods.

Studies in recent years also do not give an unambiguous picture. Cangombe et al., studying Angolan banks using the dynamic GMM method, recorded a negative and statistically significant relationship between bank size and ROA. The authors note that in larger banks, management complexity and operational inefficiency can limit profitability [**5**, p. 13]. A similar result was obtained by Bortoluzzo et al., studying data on about 1200 banks in 101 countries using quantile regression. Their results show that bank size has a negative relationship with profitability in all quantiles studied, with this relationship being more pronounced in the case of banks with high profitability. The capital adequacy ratio also had a negative coefficient in the main quantile models [**4**, pp. 6–7].

On the other hand, Athanasoglou et al., analyzing banks in South-Eastern Europe, showed that a number of bank-specific factors have a significant relationship with profitability, while the effect of balance sheet structure was not statistically significant [**3**, p. 1]. In the case of bank size, their ROA models mainly recorded a positive relationship, which the authors attribute to economies of scale [**3**, pp. 12–13]. These different results indicate that the relationship between bank size and profitability may depend on market characteristics, the sample, and the methodology used.

Radovanov and co-authors, studying banks in the Western Balkans, compared the factors related to profitability and liquidity. According to their results, bank-specific and macroeconomic factors are generally related to both indicators in the same direction, but for some variables the results differ [**7**, p. 1]. This is also important for this study, since here

the performance of banks is assessed through ROA, and the results cannot be directly extended to other performance indicators.

Studies directly related to the region are also important for the South Caucasus. Dabla-Norris and Floerkemeier, using the example of the Armenian banking system, showed that the size of the bank, liquidity and market structure play an important role in the formation of interest rate spreads and net interest margin [**2**, p. 4]. They also noted that larger banks generally had lower interest rate spreads, which is associated with economies of scale [**2**, p. 13]. Almarzoqi and Ben Naceur, studying banks in the Caucasus and Central Asia, showed that interest margins are related to both bank-specific factors and the competitive and macroeconomic environment, and their role is not the same in different countries [**1**, p. 2]. Although these studies focus primarily on interest margins, they provide a useful basis for comparing the banking systems of Armenia and Georgia.

The relationship between loan portfolio growth and profitability is also unclear. Lending expansion can increase interest income, but the outcome also depends on loan quality and subsequent loan losses. Koju et al.'s study shows that the level of non-performing loans is related to both bank-specific and macroeconomic factors [**6**, p. 111]. The authors' review of the literature also notes that rapid loan growth in the context of weak lending standards can be accompanied by higher loan losses [**6**, p. 115]. Therefore, rapid loan portfolio growth in itself cannot be seen as evidence of higher or more sustainable profitability.

The literature review shows that bank profitability is related to a number of internal factors, but the direction and strength of these relationships vary across countries and time periods. The results may also depend on the methodology used and the characteristics of the sample. Therefore, it is important to understand to what extent the relationships recorded in international studies are also observed in the case of Armenian and Georgian banks. Comparative studies of Armenian and Georgian commercial banks are still limited, especially those works where the two countries are considered within the same period and within the same methodology. This study attempts to fill this gap by assessing the relationships between bank internal characteristics and return on assets (ROA) based on a comparable sample.

Research methodology

The research used data from 10 commercial banks in Armenia and Georgia for 2018–2024. The Armenian sample included Ameriabank, Inecobank, Ardshinbank, ACBA Bank, and Armeconombank, while the Georgian sample included Bank of Georgia, TBC Bank, Liberty Bank, Basisbank, and Credo Bank.

In total, 70 bank-year observations were studied, 35 from Armenian and 35 from Georgian banks. The data were taken from the banks' published annual financial statements, which were prepared in accordance with IFRS requirements. Data on total assets, net profit, fixed assets, and net loans to customers were used for the analysis. Five banks were also selected from Georgia so that the samples of the two countries were comparable and all the necessary data were available for the entire 2018–2024 period.

The main indicator of the study is return on assets (ROA), which is calculated by dividing net profit by total assets.

The analysis used bank size (SIZE), fixed assets ratio (PPE_RATIO), loan portfolio growth rate (LOAN_GROWTH), and asset growth rate (ASSET_GROWTH). These indicators characterize the size of the bank, the structure of its assets, and its growth rate.

NPL ratio, capital adequacy ratio and Cost-to-Income ratio were not included in the analysis, as these data were not fully available for all selected banks in Armenia and Georgia. This is one of the limitations of the study and should be taken into account when evaluating the results.

The description of the variables and the calculation method are presented in Table 1.

Table 1. *Description of research variables*

Variable	Definition	Calculation
ROA	Return on Assets	Net Income / Total Assets
SIZE	Bank Size	ln(Total Assets)
PPE_RATIO	Property, Plant and Equipment Ratio	Fixed Assets / Total Assets
LOAN_GROWTH	Loan Portfolio Growth	Annual Percentage Change in Loans
ASSET_GROWTH	Asset Growth	Annual Percentage Change in Assets

Since the total assets of banks in each country are presented in national currency, the SIZE indicator was calculated as the natural logarithm of total assets without unifying currencies. Therefore, the average SIZE values for Armenia and Georgia were not directly compared. Instead, SIZE was used

to assess the relationship between bank size and return on assets (ROA) within each country.

The analysis was conducted in three stages. First, the main descriptive statistics were calculated.

In the second stage, the average values of ROA, PPE_RATIO, LOAN_GROWTH and ASSET_GROWTH indicators for Armenian and Georgian banks were compared using Welch's t-test and Mann–Whitney U test. The comparison was made based on both all bank-year observations (35 for Armenia, 35 for Georgia) and the average indicators for each bank (5 banks from each country). In the first case, the data of the same bank from different years are not completely independent, and in the second case, the sample is small, so the results were evaluated taking into account these limitations.

In the third stage, the relationship of ROA with other variables was studied separately for each country using Pearson and Spearman correlation coefficients. The difference in Pearson coefficients for two countries was checked with Fisher's z-test. All statistical calculations were performed in the Python programming language using pandas, numpy and scipy.stats libraries.

Since no additional correction for multiple testing was applied, p-values close to 0.05 were interpreted with caution.

Analysis

First, the main financial indicators of Armenian and Georgian banks were compared to see what differences exist between the two country samples. Descriptive statistics and results of cross-country tests for 2018–2024 are presented in Table 2. Since no correction for multiple comparisons was applied, p-values close to 0.05 should be interpreted with caution.

Table 2. *Descriptive Statistics and Cross-Country Tests (2018–2024)*

Variable	Country	Mean	Standard Deviation	Median	Welch's t-test (p value)	M-W U-test (p value)	Bank Means t-test (p value)	Bank Means U-test (p value)
ROA	Armenia	0.0228	0.0131	0.0176	0.5207	0.2545	0.6918	1.0000
	Georgia	0.0246	0.0106	0.0224				
SIZE	Armenia	20.3062	0.5915	20.3152				
	Georgia	15.6043	1.2659	15.1077				
PPE_RATIO	Armenia	0.0246	0.0138	0.0203	0.0643	0.1102	0.5067	0.5476
	Georgia	0.0324	0.0202	0.0271				
LOAN_GROWTH	Armenia	17.11%	14.36%	16.52%	0.0785	0.0635	0.0110	0.0317
	Georgia	23.00%	13.23%	20.58%				
ASSET_GROWTH	Armenia	17.64%	10.50%	14.35%	0.4205	0.3783	0.2857	0.1508
	Georgia	20.11%	14.63%	18.67%				

Note: *p-values are presented without correction for multiple comparisons, so values close to 0.05 should be interpreted with caution. The statistical significance level was set at 5% ($p < 0.05$). No comparisons were made between countries for SIZE, as the indicator was calculated based on assets expressed in national currencies and is not directly comparable.*

First, let's look at return on assets (ROA). The average ROA of Armenian banks was 2.28%, while that of Georgian banks was 2.46%. Although Georgia's figure is slightly higher, statistical tests did not show a significant difference between the two countries, neither based on all bank-year observations ($p = 0.5207$) nor on the average values of banks ($p = 0.6918$).

In the case of loan portfolio growth, the picture is somewhat different. The average growth in Georgian banks was 23.0%, while in Armenia it was 17.1%. Both tests on the average values of banks showed a statistically significant difference ($p = 0.011$ and $p = 0.032$). However, when considering all bank-year observations together, the results are not significant at the 5% level ($p = 0.079$ and $p = 0.064$).

The share of fixed assets was also higher in Georgian banks, on average 3.24%, compared to 2.46% in Armenia. Based on all observations, the difference is close to the threshold of statistical significance ($p = 0.064$), but it is not confirmed based on the average values of the banks. The average growth rate of assets is also higher in Georgia, 20.11%, while in Armenia it was 17.64%. This difference, however, is not statistically significant.

After comparing the main indicators of the two countries, the analysis continued within each country, assessing the relationship of ROA with bank size, asset structure and growth indicators. For this purpose, Pearson and Spearman correlation coefficients were calculated, and the difference between the Pearson coefficients of Armenia and

Georgia was tested using Fisher's z-test. The results are presented in Table 3.

Table 3. *Correlations between ROA and explanatory variables by country*

Variable	Country	Pearson r (p-val)	Spearman ρ (p-val)	Fisher Z (p-val)
SIZE	Armenia	0.4948 (0.0025)	0.4020 (0.0167)	−0.4850 (0.6276)
	Georgia	0.5808 (0.0003)	0.5249 (0.0012)	
PPE_RATIO	Armenia	−0.3151 (0.0652)	−0.2661 (0.1223)	−0.1187 (0.9055)
	Georgia	−0.2882 (0.0932)	−0.1053 (0.5471)	
LOAN_GROWTH	Armenia	0.4057 (0.0156)	0.1992 (0.2514)	1.6227 (0.1047)
	Georgia	0.0247 (0.8879)	−0.0434 (0.8044)	
ASSET_GROWTH	Armenia	0.4075 (0.0151)	0.1401 (0.4223)	1.7235 (0.0848)
	Georgia	0.0018 (0.9919)	−0.1162 (0.5060)	

Note: *Fisher's z-test compares the Pearson correlation coefficients for Armenia and Georgia. The statistical significance level was set at 5% ($p < 0.05$).*

Table 3 shows that the most striking result concerns bank size. A positive and statistically significant relationship between SIZE and ROA is observed in both Armenia and Georgia, using both Pearson and Spearman coefficients. The picture is different for loan portfolio and asset growth. In Armenia, Pearson coefficients show a moderately positive relationship with ROA, while in Georgia these relationships are almost absent. However, the Spearman results for Armenia are not statistically significant, so the results for growth indicators should be interpreted with caution. The relationship between SIZE and ROA is also presented in Figure 1.

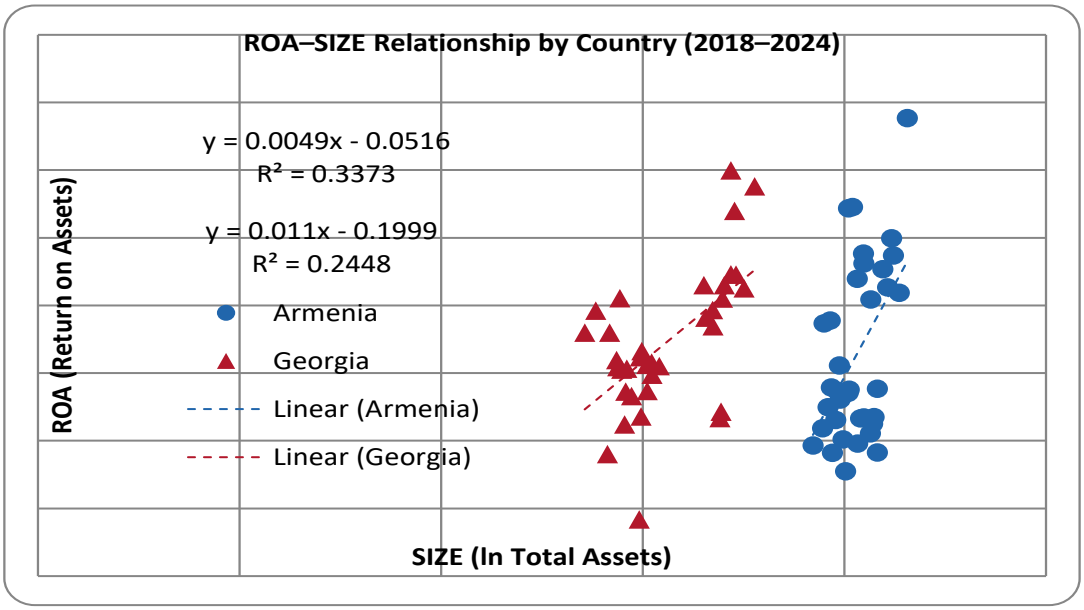

Figure 1. *ROA–SIZE Relationship by Country (2018–2024)*

Note: *Because SIZE is calculated in national currencies, SIZE values for two countries are not directly comparable. The graph represents the relationship between SIZE and ROA within each country. The difference in these relationships is not statistically significant using Fisher's z-test ($p = 0.628$).*

Both in Armenia ($r = 0.4948$, $p = 0.0025$) and in Georgia ($r = 0.5808$, $p = 0.0003$) a positive and statistically significant relationship is observed between bank size and ROA. This result is also visible in Figure 1. It coincides with the direction of the results of Athanasoglou et al., where a positive relationship was mainly recorded between bank size and ROA. At the same time, it differs from the results of Cangombe et al., in whose study the relationship between bank size and ROA was negative. However, the correlation analysis does not allow us to claim that a large bank size in itself leads to higher profitability.

In the case of fixed assets, the relationship between PPE_RATIO and ROA is negative in both countries: in Armenia $r = -0.3151$, and in Georgia $r = -0.2882$. However, at the 5% significance level, these results are not statistically significant. This is generally consistent with the study by Athanasoglou et al., where the role of asset structure in shaping bank profitability was also assessed to be limited.

In the case of loan portfolio and asset growth, the Pearson coefficients for Armenian banks show a

moderately positive relationship between both loan portfolio growth ($r = 0.4057$, $p = 0.0156$) and asset growth ($r = 0.4075$, $p = 0.0151$) and ROA. In the case of Georgia, these relationships are almost absent, $r = 0.0247$ and $r = 0.0018$, respectively. However, Fisher's z-test does not confirm the difference between countries at the 5% level, and the Spearman coefficients for Armenia are also not statistically significant ($\rho = 0.1992$ and $\rho = 0.1401$). Therefore, the relationship between growth rates and ROA should be assessed with caution. Rapid credit growth may be accompanied by higher short-term returns, but it does not in itself indicate the long-term quality or riskiness of the loan portfolio.

CONCLUSION

The study compared the financial performance of 10 commercial banks in Armenia and Georgia for 2018–2024.

The results show that there is no statistically significant difference between the average ROA of the selected banks in the two countries. At the same time, the average growth rate of the loan portfolio in Georgian banks was higher than in Armenia.

The most obvious result concerns the size of the bank. In both Armenia and Georgia, a positive and statistically significant relationship was observed between SIZE and ROA. However, this does not mean that the increase in the size of the bank itself leads to higher profitability.

In the case of Armenian banks, Pearson results showed a positive relationship between the growth of the loan portfolio and assets with ROA, while in Georgia such a relationship was almost not observed. However, the Spearman results for Armenia are not statistically significant, and Fisher's z-test does not confirm the difference between the countries at the 5% level.

These observations should be assessed within the limitations of the study and should not be interpreted as causal inferences.

Several practical observations can be drawn from the results.

• For bank management: The positive relationship between bank size and ROA suggests that larger banks in the sample had higher profitability on average. However, this does not mean that increasing bank size per se increases ROA.

• For regulators: The higher loan growth recorded by Georgian banks can also be viewed in conjunction with indicators of loan portfolio quality and risk.

• For investors and analysts: Bank size can be viewed as an additional indicator related to profitability, but not as a basis for independent assessment.

The study has several limitations. Only 10 banks were included in the sample, which limits the generalizability of the results. In addition, the database lacks indicators for credit risk, capital adequacy, and a number of other important indicators. Data from different years of the same bank are not completely independent, and in the case of analysis with averages of each bank, the sample is too small. Additional correction for multiple statistical tests was also not applied. Therefore, the results obtained should be considered as preliminary associations, not causal evidence. In future studies, it is possible to expand the sample to include more banks or quarterly data, add credit risk and capital adequacy indicators, and apply dynamic panel methods in the case of a larger database. In order to compare the size of banks in the two countries, it would also be desirable to present assets in a single currency.

References

1. **Almarzoqi, R, Ben Naceur, S.** Determinants of Bank Interest Margins in the Caucasus and Centrel Asia. – IMF Working Paper, WP/15/87. Washington, D.C.: International Monetary Fund, 2015. DOI: 10.5089/9781484342817.001.
2. **Dabla-Norris, E., Floerkemeier, H.** Bank Efficiency and Market Structure: What Determines Banking Spreads in Armenia? – IMF Working Paper, WP/07/134. Washington, D.C.: International Monetary Fund, 2007. DOI: 10.5089/9781451866988.001
3. **Athanasoglou, P.P., Delis, M. D., Staikouras, C. K.** Determinants of Bank Profitability in the South Eastern European Region. Pp. 1-17. // *Jounral of Financial Decision Making*, 2006, Vol. 2, No. 2.
4. **Bortoluzzo, A. B., Ciganda, R. R., Bortoluzzo, M. M.** Determinant Factors of Banking Profitability: An Application of Quantile Regression for Panel Data. // *Future Business Journal*, 2024, Vol. 10, No. 1, Article 56. DOI: 10.1186/s43093-024-00347-z.
5. **Cangombe, E. L., Almeida, L. G., Tavares, F. O.** Determinants of Banking Profitability in Angola: A Panel Data Analysis with Dynamic GMM Estimation. // *Risk,* 2025, Vol. 13, No. 7, Article 123. DOI: 10.3390/risks13070123.
6. **Koju, L., Koju, R., Wang, S.** Macroeconomic and Bank-Specific Determinants of Non-Performing Loans: Evidence from Nepalese Banking System. Pp. 111-138. // *Journal of Central Banking Theory and Practive,* 2018, No. 3. DOI: 10.2478/jcbtp-2018-0026.
7. **Radovanov, B., Milenković, N., Kalaš, B., Horvat, A. M.** Do the Same Determinants Affect Banks' Profitability and Liquidity? Evidence from West Balkan Countries Using a Panel Data Regression Analysis. // *Mathematics,* 2023, Vol. 11, No. 19, Article 4072. DOI: 10.3390/math11194072.

Сдана/Հանձնվել է՝ 09.09.2026
Рецензирована/Գրախոսվել է՝ 16.09.2026
Принята/Ընդունվել է՝ 23.09.2026