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IS THE PROFITABILITY OF THE MACEDONIAN BANKS DRIVEN BY HIGHER EFFICIENCY?

Abstract: The question of how Macedonian banks managed to maintain their performances and double their profits even during periods of slow credit growth and low financial intermediation is always contentious. This paper aims to identify the drivers supporting positive and stable returns in the Macedonian banking sector, aspiring to try to answer the question: Does higher efficiency drive the Macedonian banks' profitability?

The paper is focused on the determinants of bank profitability in the Macedonian banking sector. It aims to identify the drivers supporting positive and stable returns in 12 Macedonian banks for the period from 2007 to 2021. Using regression with time-fixed effects and a yearly data set compiled from revised individual financial reports of each bank, authors alternatively evaluate the impact of five independent variables (loan to deposits ratio, net-interest margin, overhead costs, equity multiplier, and fee income) on return on assets, set in the model as a dependent variable.

Based on the results, it can be concluded that several factors, including net interest income, operating costs, and fee income, influence banks' profitability. These variables significantly impact banks' profitability, as indicated by the estimated coefficients of the panel data model. On the other hand, the loan-to-deposit ratio and assets-to-capital ratio were insignificant in the model, suggesting that they have little to no impact on bank profitability.

Keywords: cost efficiency, bank profitability, net-interest margin, time series models

JEL classification: C22, E44, F65, G21

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Introduction

The efficiency of the banking sector in the previous decades has been under the strong influence of the high level of globalization and integration within the financial system. Furthermore, the rapid development and information technology application has caused a drastic decline in the expenses for processing financial transactions. The fierce competitive battle, conditioned by the flows of deregulation, has decreased the profit margins of the banks that seek to compensate through increasing the economy of scale and diversification of business activities. Strengthening market competitiveness is followed by a highly expressed tendency of consolidation of the banking institutions. Banking mergers and acquisitions appear as a mechanism that utilizes the economy of scale and activities diversification, which leads to greater efficiency and to the creation of competitive advantage for banking institutions in an uncertain and dynamic environment.

This paper aims to identify the drivers supporting positive and stable returns in the Macedonian banking sector. The paper structure continues with the literature review with a special focus on several models and techniques developed to measure bank efficiency and profitability, providing valuable insights into bank performance, and helping banks to make decisions that improve their performances. The second section of the paper represents a trend analysis of the chosen indicators connected to the profitability and efficiency of the Macedonian banking sector. Moreover, it includes the values of the efficiency indicators – net interest margin and operating costs and the indicators of profitability – ROA and ROE as well as other indicators as additional vital aspects influencing the bank's profitability representing financial intermediation, net-fee income, and capital adequacy based on data from the National Bank of the Republic of North Macedonia for the period between 2004 and 2021.

The next section of the paper is focused on the determinants of bank profitability in the Macedonian banking sector aiming through a panel data model to identify the drivers supporting positive and stable returns in 12 Macedonian banks from 2007 to 2021. This part describes the methodology with the interpretation and discussion of the results from the empirical data analysis. Finally, the last part represents the conclusion of the research.

1. LITERATURE REVIEW

The banking industry plays a crucial role in the financial system of any country. To ensure financial stability, banks need to operate efficiently. Therefore, analyzing bank efficiency has been a popular research area for economists and finance researchers. This literature review aims to provide an overview of the models, techniques, and approaches used to measure bank efficiency and profitability.

One of the most used models for measuring bank efficiency is the Data Envelopment Analysis (DEA) model (Charnes, Cooper, and Rhodes, 1978). DEA is a non-parametric approach that measures efficiency based on multiple inputs and outputs. Several studies, such as Berg, Forsund, and Jansen (1992) and Coelli, Rao, and Battese (1998), have used DEA to measure bank efficiencies. Another technique used to measure bank efficiency is the Two-Stage Network Data Envelopment Analysis (TSN-DEA) model. The TSN-DEA model allows for the measurement of efficiency in a two-stage process. This model has been used to measure efficiency in banks with two-stage processes, such as loan origination and servicing.

Another popular approach for measuring bank efficiency is the Stochastic Frontier Analysis (SFA) model (Aigner, Lovell, and Schmidt, 1977). SFA is a parametric approach that assumes a random error component exists in the production process. Several studies have used SFA to measure bank efficiencies, such as Hjalmarsson and Vejsiu (2004) and Zaim and Karasoy (2011). The Malmquist Productivity Index (MPI) is another commonly used model for measuring bank efficiency (Färe, Grosskopf, Lindgren, Roos, and Sersenová, 1992). MPI is a non-parametric approach that measures productivity change over time. Several studies have used MPI to measure bank efficiencies, such as Barros, Santos, Assaf (2008) and Worthington and Hurst (2010). Other models and techniques have also been used to measure bank efficiency, such as the Free Disposal Hull (FDH) model (Worthington and Higgs, 2004) and the Two-Stage Network Data Envelopment Analysis (TSN-DEA) model (Lin, Chiu, and Yu, 2014). Abd Karim, Sok, & Hassan's (2010) study estimates a cost efficiency using the stochastic cost frontier approach assuming a regular gamma efficiency distribution model. The simultaneous equation regression results indicate that higher non-performing loan reduces cost efficiency. Likewise, lower cost efficiency increases non-performing loans. The result also supports the hypothesis that poor management in banking institutions results in bad-quality loans and escalates the level of non-performing loans. Additionally, lower cost

efficiency increases non-performing loans. The results are consistent with the studies by Altunbas et al. (2000), Fan and Shaffer (2004), and Girardone et al. (2004) that found that non-performing loans lead to inefficiency in the banking sector.

Several studies have used the ROA and ROE models to measure bank profitability, such as those by Oviatt and Rose (1987) and Batten, Hogan, and Szilagyi (2010). The DuPont Model is another commonly used model for measuring bank profitability, as it breaks down ROE into three components: net profit margin, asset turnover, and equity multiplier (Shin and Soenen, 1998). Additional studies have used this model to analyze the components of bank profitability, such as the study by Molyneux, Thornton, and Lloyd-Williams (1996).

When measuring bank performances, several authors propose a new methodological framework by considering the bank's business model as a crucial factor for the bank's performance. For example, Badunenko, O., Kumbhakar, S. C., and Lozano-Vivas, A. (2021) investigate the long and short-term effects of bank's business model choices on performance to assess if banks are successful in achieving cost-efficient business model. Farnè and Vouldis (2017) divide a similar set of banks into four clusters. The first two are commercial banks with large loan portfolios that differ in their funding base: one is mainly deposit-funded, whereas the other is wholesale-funded, through bonds and interbank markets; the third includes banks with a significant share of trading activities and holding securities portfolios funded in the interbank and wholesale markets. The fourth, the universal banking model, combines the other three. Tran, D. V., Hoang, K., and Nguyen, C. (2021), investigating the impact of economic policy uncertainty (EPU) on banks' business activities, represent the first study shedding light on how uncertainty in economic policies influences the choice of bank business model. Venturelli, V., Landi, A., Ferretti, R., Cosma, S., and Gualandri, E (2021) investigate how the financial market defines and evaluates different business models. Finally, Bonaccorsi di Patti, E., and Palazzo, F. (2020) investigate the impact of macroeconomic conditions on the profitability of EU banks by testing for differential effects according to the business model.

Regression analysis is also commonly used to identify the factors that affect bank profitability. Several studies have used regression analysis to identify the determinants of bank profitability, such as Demirgüç-Kunt and Huizinga (1999) and Athanasoglou, Brissimis, and Delis (2008). Borroni, M., and Rossi, S. (2019) focus on the determinants of bank profitability in Europe and

aims to identify the drivers supporting positive and stable returns. Simeon-ovski, Naumovska, and Petkovski, 2020 have used bank density to measure financial deepening to investigate its linkage with financial development and economic performance in 41 European countries from 2004 to 2018. Further-more, Elekdag, S., Malik, S., and Mitra, S. (2020) explore the determinants of profitability across large euro area banks using an approach based on condi-tional profitability distributions, how selected determinants differentially in-fluence the distribution of euro area bank profitability.

In conclusion, several models and techniques have been developed to measure bank efficiency and profitability. DEA, SFA, and MPI are among the most used approaches to measure bank efficiency, while the ROA, ROE, and DuPont models are popular models for measuring bank profitability. Regres-sion analysis is also commonly used to identify the determinants of bank prof-itability. These models and techniques can provide valuable insights into bank performance and help banks to make decisions that improve efficiency and profitability.

2. ANALYSIS OF THE MACEDONIAN BANKING SECTOR PERFORMANCES

The Macedonian banking system comprises 14 banks (The National Bank of the Republic of North Macedonia, 12 commercial banks, and one de-velopment bank). Regarding the ownership structure of the Macedonian bank-ing sector from 1998 to 2021, the highest portion of foreign owners, 75,7% in 2021, has replaced the predominant portion of domestic owners, 61,7 % in 1998. The Macedonian banking sector is characterized by a satisfactory level of profitability, which can be ascertained through the movement of return on assets (ROA) and return on equity (ROE) indicators. Figure 1 shows that after the downward trend during the financial crisis, the values of these indicators returned to the previous level, and the financial result of the banks was more than doubled compared to the maximum amount reached just before the finan-cial crisis. Even in a Health and Economic crisis, the banking system main-tained its stability and contributed to mitigating the consequences of the crises, registering solid profitability indicators of the banking system. The five largest banks generate approximately 90% of the profit.

Figure 1. Profitability of the Macedonian banking sector – ROA and ROE in % (left) and financial result in millions of EUROs (right)
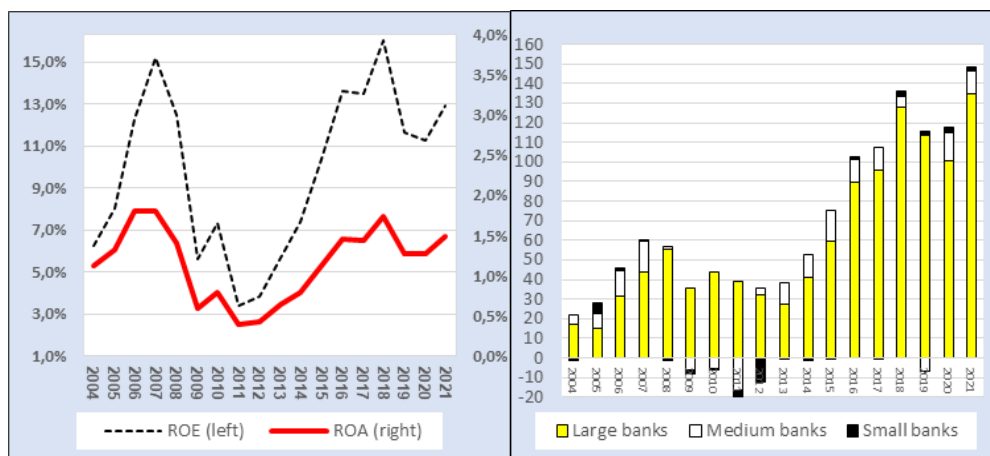
Source: Authors' calculations, based on data from the National Bank of the Republic of North Macedonia

Nevertheless, the period after the 2008 financial crisis marked a new phase in the lending activity of banks in North Macedonia, a period of slower credit growth which is a "new normal" of credit growth rates continuously in single digits. Hence, the question of how banks managed to maintain their performances and double their profits during such slow credit growth is still debatable.

In this regard, banks show the accelerated growth of loans to individuals, especially after the financial crisis. In 2021, loans to households had a larger share than loans to companies, unlike the beginning of the analyzed period when these loans participated in the total loans by only about 10%. Furthermore, with more favorable (cheaper) short-term sources, banks finance loans with a longer maturity, characterized by higher interest rates, especially in the household sector (characterized by low-interest elasticity). Hence, long-term loans to households provide the opportunity to generate higher net interest income within this structure of assets and liabilities. However, these trends are more likely to be registered in a group of large-sized banks.

On the other hand, referring to the bank's deposit base transformation, after several years of upward trends of the loan-to-deposit ratio, the banks have started slowing the process of financial intermediation between surplus and deficit economic units, as some kind of "new normal," as well. Figure 2 (left) shows the loan-to-deposit ratio trends for the banking sector, large-sized

banks, and small and medium-sized banks separately. Considering other more favorable investment alternatives, large-sized banks tend to keep this ratio below 85%. Even though these banks have extra liquidity, they tend to replace the financing of private companies, considering the investments in government securities and deposits and assets in the Central Bank as more secure and profitable alternatives. Showing the changes in the absolute amounts of the individual positions that represent assets of the Macedonian banking sector as well as their share in total assets in the period from 2004 to 2021, Figure 2 (right) confirms that the amount of bank assets invested in securities, deposits, and assets in the NBRM increased in 2021 compared to 2004 increased by more than ten times (from 295,4 to 3.121,5 millions of EUR, which also increased their share in total assets from 15,3% to 30,1%.

Figure 2. Loan to deposits ratio in % (left) and structure of Macedonian banks' assets (right) in millions of EUR for the period from 2004 to 2021
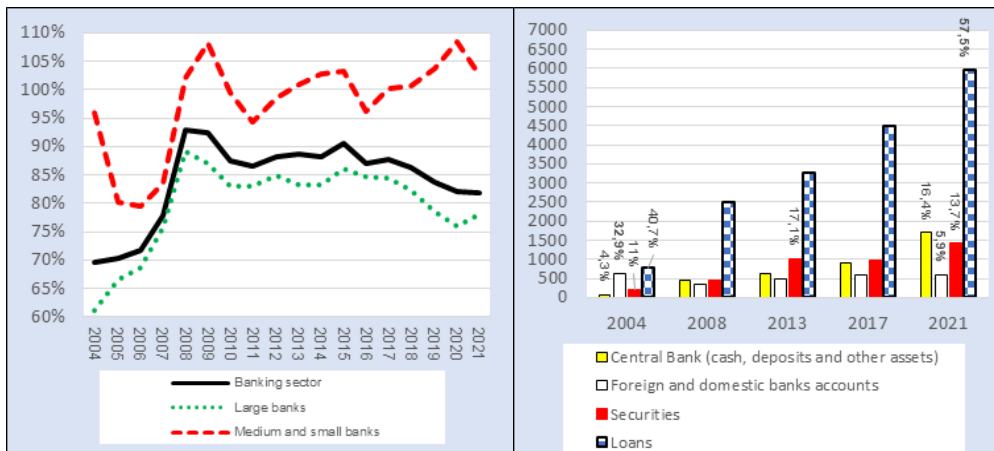
Source: Authors' calculations, based on data from the National Bank of the Republic of North Macedonia

However, room for more credible discussion for maintaining the bank's profitability considering dynamic changes in the circumstances of the bank's operating environment can be found through analysis of the bank's efficiency ratios such as net interest margin as well as overhead cost calculated as a share of net interest income or operating cost in total banks assets. Furthermore, we would also consider the net fee income and bank capitalization as additional vital aspects influencing the bank's profitability (Figure 3).

Figure 3. Efficiency indicators in % (left) and Capital adequacy of the Macedonian banking sector in % and millions of EUR (right) for the period from 2004 to 2021
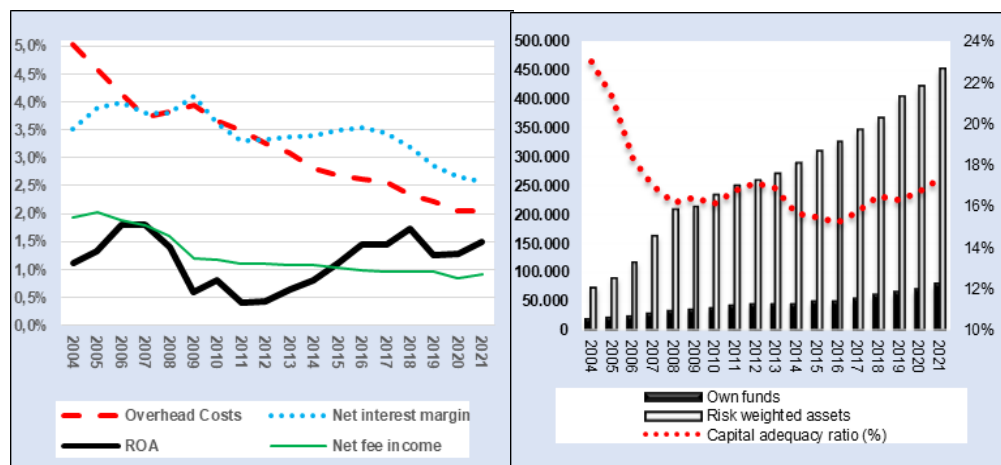
Source: Authors' calculations, based on data from the National Bank of the Republic of North Macedonia

Except for the 2008-2009 financial crises, Figure 3 (left), illustrating the ***overhead costs*** ratio's trend, indicates constantly improved cost efficiency, reflected by the reduced share of the banks' operating costs in the bank's assets. Namely, due to the advantages of the economy of scale, increased competitiveness, investments in new contemporary software solutions, and increased labor productivity, large-sized banks notice a sustainable reduction of operating costs with the potential to further strengthen the bank's efficiency.

The tendency to reduce the ***net interest income*** and increase the operating costs during the financial crisis was followed by a fall in the profitability indicators. Thus, several banks (from the group of small and medium-sized banks) registered a loss. In conditions of a slight increase of the net interest income during the reduction of the operating costs, in the period after the crises, the profitability indicators were stabilized. In the next period, in the environment of declining interest rates, banks managed to reduce the interest rate of their liabilities with higher intensity than the reduction of the interest rates of their placements. Consequently, the sharp decline in interest expenses followed by a slighter decrease in the bank's interest income was one of the main reasons for a significant increase in the profit of the banking system. Since maintaining a favorable net interest income became a fundamental challenge

for banks in the following period, the stagnation of the net interest margin was replaced with their reduction. However, banks continued to work profitably due to the reduced operating cost and increased fee income.

Namely, in conditions of low interest rates and with significantly exhausted room for further reduction of the cost for their deposit financing, Macedonian banks were increasingly oriented towards finding alternatives to compensate for the reduced contribution of the net interest income to the formation of the returns ratios. For example, they managed to increase their *fee income* (Figure 3, left) by increasing the scope of the activities that generate commission income or by introducing new services or more sophisticated business activities. At the same time, in the absence of significant amounts of recapitalization, banks are mainly oriented to internal capital creation (reinvesting profits made in the capital funds), which emphasizes the importance of profitability for the solvent positions of banks, as well as for supporting banks activities (Figure 3, right).

3. DATA AND METHODOLOGY

This part of the paper is focused on the determinants of bank profitability in the Macedonian banking sector and aims to identify the drivers supporting positive and stable returns in 12 Macedonian banks for the period from 2007 to 2021. Using regression with time-fixed effects and a yearly data set compiled from revised individual financial reports of each bank, authors alternatively evaluate the impact of five independent variables (loan to deposits ratio, net-interest margin, overhead costs, equity multiplier, and fee income) on return on assets, set in the model as a dependent variable.

This session starts by presenting the collected data; then, the paper refers to a descriptive analysis of the variables used. Finally, an explanation of the assumptions on which the model is based follows. Table 1 shows the variables used in the econometric model accomplished by explaining the premises for their expected relationship with the dependent variable.

Table 1. Specification of the variables used in the empirical analysis

Type of variable	Specification	Description of variables	Expected Result
Dependent variable	Return on assets (**ROA**)	The ratio between the net income and the average annual assets of the banks	
Independent variable	Financial intermediation ratio (**LOANDEP**)	The ratio between total loans and total deposits	(+)
Independent variable	Net-interest margin (**INTMARGIN**)	The ratio between the net interest income and the average annual assets of the banks	(+)
Independent variable	Overhead costs (**COSTS**)	The ratio between the operating costs and the average annual assets of the banks	(-)
Independent variable	Equity multiplier (**EM**)	Proportion of bank's assets financed by equity	(-)
Independent variable	Fee income (**FEEINC**)	The ratio between the fee income and the average annual assets of the banks	(+)

Source: Authors' calculations

Panel data analysis allows for examining variable changes over time and the differences between individuals or groups. In this case, the dependent variable is bank ROA. The independent variables include loan/deposit ratio, net interest income to assets ratio, operating costs to assets ratio, equity multiplier ratio, and fee-income to assets ratio. The loan-to-deposit ratio calculates the bank's percentage of loans compared to deposits received. A greater ratio could mean the bank is taking on more risk, but it could also mean it is doing better financially. A lower ratio can mean that the bank is more risk-averse and prudent. The net interest income represents the net interest income the bank receives from its assets-to-assets ratio. A higher ratio shows that the bank is more effective at turning its assets into income. The operating costs to assets ratio measure the amount of operating expenses incurred by the bank relative to its assets. A lower ratio indicates that the bank is more efficient at managing its expenses. The assets-to-capital ratio measures the amount of assets the bank holds relative to its capital. A higher ratio may indicate that the bank is taking

on more risk, but it may also suggest that it has more resources to deploy. The fee-income-to-assets ratio measures the portion of fee-income generated by the banks in their average annual assets. A greater fee income is a favorable alternative for compensating the reduced contribution of the net interest income to the formation of the return ratios. Table 2 shows the dataset's descriptive statistics and includes measures of central tendency: mean and median, the minimum and maximum value of the data, and the standard deviation.

Table 2: Descriptive statistics of the dataset

Variables	Mean	Median	Std. Dev.	Min	Max
ROA	0,001286	0,006468	0,023185	-0,107075	0,039495
LOANDEP	0,809739	0,782576	0,289744	0,202603	4,006603
INTMARGIN	0,034723	0,033928	0,011519	0,000000	0,097384
COSTS	0,040462	0,034492	0,025295	0,013660	0,186474
FEEINC	0,010061	0,009240	0,003696	0,003979	0,025274
Observations	206	206	206	206	206

Source: Authors' calculations

The empirical approach in this paper aims to estimate the parameters of each independent variable and determine the relationship between the independent variables and the return of the bank's assets. Therefore, let's define the following:

$$y_{it} = \text{ROA, where } i = 1, 2, \ldots, N \text{ and } t = 1, 2, \ldots, T$$
$$X' = [x_1 \quad x_2 \quad , \ldots, \quad x_k], \text{ where each } x_k \text{ represnts a single independent variable}$$
$$i = 1, 2, \ldots, N, \text{ where } i = 1 \text{ is the first and } N \text{ is the } 12^{th} \text{ individual bank in the database}$$
$$t = 1, 2, \ldots, 15, T, \text{ where } t = 1 \text{ is the end of 2007 and } t = T \text{ is the end of of 2021}$$

The decomposition of the form of the primary regression function allows us to determine and quantify the connection between the selected determinants and the return on assets (ROA). We tried to estimate the parameters using regression with time-fixed effects for five indicators in the selected sample of 12 banks for 15 years. To avoid the multicollinearity with the initial value of the functions in the system, in this model, we assume that the individual fixed effects are equal to zero for each arbitrary "i" entry. Consequently, the regression function is defined as:

$$Y = XB + TD + e$$

Y = total assets of OFIs XB = undependent varaibles
TD = parameter vector e = residuals

Or in a decomposed form of a matrix:

$$\begin{pmatrix} y_{1,1} \\ y_{1,2} \\ y_{1,3} \\ \vdots \\ y_{N,T} \end{pmatrix} = \begin{pmatrix} 1 & x_{1,1,1} & \cdots & x_{1,k,T} \\ & \vdots & \ddots & \vdots \\ 1 & x_{N,1,1} & \cdots & x_{N,k,T} \end{pmatrix} \begin{pmatrix} \beta_0 \\ \beta_1 \\ \beta_2 \\ \vdots \\ \beta_k \end{pmatrix} + \begin{pmatrix} t_{1,1} & \cdots & t_{1,T} \\ \vdots & \ddots & \vdots \\ t_{N,1} & \cdots & t_{N,T} \end{pmatrix} \begin{pmatrix} d_1 & 0 & & 0 & 0 \\ 0 & d_2 & \cdots & 0 & 0 \\ 0 & 0 & & 0 & 0 \\ \vdots & & \ddots & & \vdots \\ 0 & 0 & \cdots & d_{T-1} & 0 \\ 0 & 0 & & 0 & d_T \end{pmatrix} + \begin{pmatrix} e_{1,1} \\ e_{1,2} \\ e_{1,3} \\ \vdots \\ e_{N,T} \end{pmatrix}$$

To complete the multiplication of the matrix, the only equation for the entire system would be as follows:

$$y_{i,t} = \beta_0 + x_{1,i,t}\beta_1 + x_{2,i,t}\beta_2 + \cdots + x_{k,i,t}\beta_k + t_{i,t}d_t + e_{i,t}$$

4. RESULTS AND DISCUSSION

In analyzing the panel data output results, looking at each independent variable's coefficients and their statistical significance is important. A positive coefficient suggests that the independent variable positively relates to bank ROA, while a negative coefficient suggests the opposite. The statistical significance of the coefficient tells us whether the relationship is likely to be real or just due to chance. It is also important to look at the model's overall fit, as measured by R-squared. A high R-squared indicates that the model can explain a large proportion of the variation in bank ROA, while a low R-squared suggests the model is ineffective. Overall, the panel data analysis can provide valuable insights into the factors driving bank ROA and help banks make more informed decisions about their lending practices, expense management, and risk management strategies.

Panel data diagnostic tests are essential to ensure the model is reliable and produces accurate results. If diagnostic tests show that the model assumptions are not being met, adjustments may be necessary to ensure the model is valid.

1. Breusch-Pagan test: The results show no evidence of heteroscedasticity, indicating that the variances of the residuals are the same across all values of the independent variables.
2. Hausman test: The results suggest that the fixed effects model is more appropriate than the random effects model. This indicates that

the coefficients of the independent variables are constant across all individuals in the panel.
3. Serial correlation test: The results show no evidence of autocorrelation, indicating that the model's residuals are not correlated with one another over time.
4. Collinearity tests: The results show no evidence of multicollinearity among the independent variables in the model, indicating that the independent variables are not highly correlated.

The results of these diagnostic tests suggest that the panel data model used in the academic paper is valid and produces accurate results. This provides confidence in the study's findings and ensures that the conclusions drawn are reliable.

Table 3 presents the results of the applied econometric model. Based on the analysis, the paper shows that the loan-to-deposit ratio and assets-to-capital ratio are statistically insignificant. This means that these variables are not associated with significant changes in bank ROA. In other words, these two independent variables do not directly impact bank profitability in this model. However, the net interest income to assets ratio, operating costs-to-assets ratio, and fee-income-to-assets ratio are all statistically significant with a probability below 1%. This means that these variables are associated with significant changes in bank ROA.

Table 3. Results of the basic model

Independent variable	Coefficient	Std. Error	t-Statistic	p-value
Constant	0,006886	0,005641	1,220747	0,2236
LOANDEP	-0,000156	0,004471	-0,034840	0,9722
INTMARGIN	0,426904	0,130972	3,259497	0,0013
COSTS	-0,757954	0,057180	-13,25553	0,0000
EM	-0,000240	0,000325	-0,739219	0,4606
FEEINC	1,228806	0,352726	3,483742	0,0006

Source: Authors' calculations

Specifically, an increase in the net interest income to assets ratio, or a decrease in the operating costs to assets ratio and provision to assets ratio, is associated with an increase in bank ROA. This suggests that these three vari-

ables are important drivers of the bank's profitability. Based on the estimated coefficients, an increase in the net interest income to assets ratio by one unit is associated with a 0.42 unit increase in bank ROA, holding all other independent variables constant. On the other hand, a decrease in the operating costs to assets ratio by one unit is associated with a 0.75 unit increase in bank ROA, holding all other independent variables constant. Finally, an increase in the provision-to-assets ratio by one unit is associated with a 1.22 unit increase in bank ROA, holding all other independent variables constant.

As for the R-squared value of 0.50, the independent variables in the model explain around 50% of the variation in the dependent variable, bank ROA. While this is a moderate level of explanatory power, the model can capture a significant portion of the factors contributing to bank profitability. Overall, these results suggest that in this specific model, factors related to net interest income, operating costs, and provision are significant drivers of bank profitability, while loan-to-deposit ratio and assets-to-capital ratio do not appear to have a significant impact. However, as the paper mentioned earlier, it's important to consider the model's specific context and underlying assumptions to fully interpret the results.

Conclusion

Based on the previous findings, it can be concluded that several factors, including net interest income, operating costs, and fee income, influence banks' profitability. These variables significantly impact banks' profitability, as indicated by the estimated coefficients of the panel data model. On the other hand, the loan-to-deposit ratio and assets-to-capital ratio were insignificant in the model, suggesting that they have little to no impact on bank profitability.

Results of the analysis in the study have found that the net interest income to assets ratio, operating costs to assets ratio, and provision to assets ratio are crucial determinants of a bank's profitability. The results show that an increase in the net interest income to assets ratio, or a decrease in the operating costs to assets ratio and provision to assets ratio, leads to an increase in bank ROA. The estimated coefficients reveal that the impact of each variable on bank ROA is different, with an increase in net interest income to assets ratio having the smallest effect and an increase in provision to assets ratio having the largest effect. These findings suggest that banks can enhance their profitability by focusing on improving these key drivers of profitability.

However, considering the negative and insignificant relation obtained for loan to deposit ratio as a signal for low level of financial intermediation, it is still questionable if the profitability of the Macedonian banks is fully driven by higher efficiency. Aspiring to other more favorable investment alternatives, large-sized banks tend to keep this ratio below 85%. Even though these banks have extra liquidity, they tend to replace the financing of private companies, considering the investments in government securities and deposits and assets in the Central Bank as more secure and profitable alternatives. Moreover, the high interest margins also point towards unsuitable allocation of the financial resources and insufficient competitiveness in the banking sector of a country. Nevertheless, constant improvement in cost efficiency, can be considered as a vital driver of bank profitability. Namely, due to the advantages of the economy of scale, increased competitiveness, investments in new contemporary software solutions, and increased labor productivity, Macedonian banks have noticed a sustainable reduction of operating costs with the potential to further strengthen the bank's efficiency.

The panel data diagnostic tests run on the model indicate that it is reliable and produces accurate results, which provides confidence in the conclusions drawn from the study. Overall, the study's results provide valuable insights into the factors that influence bank profitability, which bank managers and policymakers can use to make informed decisions and improve the overall performance of the banking industry. However, it is important to note that the findings of this study are specific to the sample of banks and the period analyzed and may not necessarily generalize to other contexts. Therefore, future studies should replicate the analysis with different samples and periods to further validate the results.

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