NON-PERFORMING LOANS AND PROFITABILITY INDICATORS: THE CASE OF THE REPUBLIC OF MACEDNIA

Ljube Jolevski, MSc[1]

Abstract

In the traditional banking model, loans play a dominant role in banks' operations. Loan portfolio quality is the main generator of banks' results. In the periods of best results, as well as in times of worst performance of banks' operations, the reasons for success or failure have been attributable to the changes in the loan portfolio quality.

The basic indicator of credit portfolio quality is the share of non-performing loans to the total credit portfolio. The consequences of an increased amount of non-performing loans may not only reduce the financial results, but also reduce the capital and increase the risk profile of the bank.

This paper investigates the influence of the non-performing loans ratio on profitability indicators in the banking system of the Republic of Macedonia for the period 2007-2015. This analysis presents the correlation and regression between the non-performing loan ratio of non-financial entities and profitability indicators: rate of return on assets and rate of return on equity, as well as the spread between interest rates on loans and deposits in denars. The results of such correlation show a moderately high negative correlation between the non-performing loans ratio and rates of return on equity and return on assets. Regression analysis shows that increasing the non-performing loans ratio has influence by reducing bank profitability. Also, the statistical analysis confirms that the profitability position of the real sector is one of the most important factors affecting the movement and level of non-performing loans.

***Key words**: non-performing loans, banks, credit portfolio, profitability, return on assets*

***JEL Classification**: G21, G01, E51*

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1 NLB Bank AD Skopje, Republic of Macedonia, e-mail: ljubejol@yahoo.com

Introduction

In a banking system with predominant traditional activities, the loan portfolio has a superior role in the business policy of banks and their risk profile. Loans are the main source of banks' revenues, but at the same time, they are tied with the highest risks and can be the main loss generator of banks. The manifestation of credit risk expressed as an impossibility of loans to be fully or partially paid by the borrowers within the conditions noted in the loan agreement means a loss for the bank. Non-performing loans are loans where payments of principal or interest are past due by 90 days. Although this definition is commonly used, each country has developed its own definition and methodology for calculating non-performing loans. However, the indicator for the share of non-performing loans in total loans is one of the basic indicators for the quality of banks' credit portfolios.

Problems in the loan portfolio have a crucial role for the problems in all other areas of banks' operations, such as low profitability, liquidity problems or use of capital to cover credit losses. They may have effects such as: reducing market confidence in the bank, increasing its reputational risk and contributing to depositors withdrawing their deposits or increasing funding costs. Also, a high amount of non-performing loans is one of the main reasons for systemic insolvency of the banking sector, which presents a threat and obstacle not only to the development of the banking system, but to the economic system as a whole.

Given the fact that exposure to credit risk is a leading source of problems in banks, an analysis of the causes and effects of non-performing loans is justified. The paper analyzes non-performing loans as the most essential part of a loan portfolio with have direct implications for the profitable and solvent position of banks. The research is focused on the analysis of the period from the beginning of the financial crisis to 2015. Using statistical methods (correlation and regression), the significant impact of non-performing loans on banks' profitability indicators is confirmed. Also, the regression confirms that the profitability position of the corporate sector has influence on the non-performing loans ratio in banks.

The paper is organized as follows. First, it gives a brief overview of previous findings regarding non-performing loans (determinants and consequences). Second, it reviews and analyzes the non-performing loans in the Macedonian banking system. Third, it conducts a statistical analysis of non-performing loans and profitability indicators of the banking sector in the Republic of Macedonia, and finally, it offers some conclusions.

Literature review

There are numerous theoretical and empirical researches on non-performing loans, especially credit risk in general. Many papers produced more than twenty years ago emphasize the connection between credit quality and economic activity, for example: King and Plosser (1984), Bernanke, Gertler and Gilchrist (1989) and Moore (1997). The high level of non-performing loans could weaken the financial stability of the country, while the improved quality of loans can act as a remedy for the economic growth in the country.

Bernanke and Gertler (1989) connect the quality of credit portfolio with business

cycles. Namely, as the economy enters a recession, the ability of the borrower to pay the loan goes down. Uncertainty about the future forces companies to refrain from investing in new facilities and decreases their future potential yield, as well as their financial power. On one hand, companies cannot repay their loans, have difficulties with loan payment, while regular loans are transferred to non-performing loans. On the other hand, the disposable income of housholds decreases and the uncertain future makes the choice of households between current and future consumption difficult.

According to Gup and Kolari (2011), at the time of approval, all credit decisions act as accurate credit decisions, but unpredictable conditions in the economic situation and other factors such as: shocks in interest rates, changes in tax laws etc. result in credit problems. Credit risk is the primary reason for the failure of banks and it is the most visible risk faced by bank managers.

Dreca (2012) finds that the situation in the banking system affects the overall economy in the country, because banks are sources of funding for better work opportunities, developing new ideas, research and overall prosperity. The most important factors affecting bank operations are: the size of the bank measured by its total assets, profitability measured by the indicator of return on assets and return on equity, the size of deposits and loans and the indicator for share of non-performing loans in total loans. According to Stuti and Bansal (2013), the best indicator of the banking industry solidity is the level of non-performing loans in the country's financial system.

Rascoelan and Mangu (2014) identify two groups of factors to explain the development of non-performing loans over time. The first group is focused on external events such as overall macroeconomic conditions affecting the creditworthiness of the borrower to repay the loans, while the second group is more focused on the movement of non-performing loans in various banks and the level of non-performing loans as determined by bank internal factors.

According to Adhikary (2007), the reasons for non-performing loans are usually associated with a lack of effective monitoring and supervision of banks, lack of effective resources in banks, weaknesses in the legal system and lack of effective debt collection strategies. The results of the survey conducted by Adebisi (2015) show that there is no connection between non-performing loans and the rate of return on assets in the Nigerian banking system, but there is a connection between non-performing loans and the rate of return on equity, i.e. the maximization of shareholder wealth is affected by movements of non-performing loans.

Research and experience show that the high share of non-performing loans in banks' balance sheets is a key structural problem in the financial sector. Thus, Rother (2010) points out that the amount of non-performing loans has the greatest impact on the level of financial intermediation and the development of the financial sector. According to the analysis, their impact is greater than the amount of capital adequacy and presents a double obstacle to the development of the financial sector. Due to the high share of problematic loans, banks raise their interest margins in order to protect themselves from the risks of possible loan write-off. Based on the surveys conducted in 19 countries in transition in the period from 1991 to 1997, he found that a one percentage point increase in the level of non-performing loans results in a 0.9 percentage point increase in the range of interest rates. On the other hand, the high level of problematic loans reduces the confidence in banks and financial sufficient do not invest their surplus funds in banks, thus causing additional problems for operations performance in the banking sector.

The recent global financial crisis experience suggests that the situation in the banking sector and the developments in the real economy are strictly related. Non-performing loans are one of the biggest problems in economic stagnation. Every problematic loan in the financial sector is seen as a mirror of a non-profitable company (Hou and Dickinson, 2007). From this point of view, the reduction of non-performing loans is a necessary condition for improving the economic status. Also, the impairment of problematic loans reduces the solvency position and risk profile of banks. Refraining from lending (because of reduced consumption and failed companies) further reduces economic activity and this reduced economic activity causes a larger amount of non-performing loans. Thus, a spiral is created, which is harmful to the banking system and the economy as a whole. Theoretical and empirical studies suggest a positive connection between market expansion and the rate of non-performing loans, which is explained by the fact that starting from the desire to achieve a greater market share, banks approve riskier loans and relax their lending criteria.

The deregulation process causes an increasing competition among banks (Salas and Saurina, 2003). Many authors determine that increased competition among banks affects increasing banks' exposure to credit risk, i.e. their credit portfolio quality is reduced as a result of relaxation of lending standards and criteria in order to collect greater credit market share (Jeong and Jung, 2013; Bolt and Tieman, 2004).

Podpiera and Weill (2008) empirically examine the connection between cost efficiency and non-performing loans in the banking industry in the Czech Republic from 1994 to 2005. They conclude that there is correlation between poor governance and non-performing loans and recommend that regulatory institutions should focus on strengthening the management performance in order to strengthen the financial system stability.

Jovic (2015) analyzes non-performing loans in Bosnia and Herzegovina, but in order to create a model to predict their movement. Applying different simple linear regression models and time series, the analysis proves that the movements of non-performing loans can be predicted at different times and periods, while non-performing loans are affected by due obligations, the growth rate of gross domestic product and interest rate spread.

Kozaric and Zunic (2015) analyze the relation between risks to which banks are exposed, the rate of non-performing loans and the rate of capital adequacy in the banking system of Bosnia and Herzegovina. In addition, as indicators of banks' risk exposure, indicators of profitability ROA and ROE, risk weighted assets, the share of loans in total assets, the loan/deposit ratio, ratio for the share of liquid assets in total assets and liquid assets terms of long-term obligations are used. They conclude that there is a strong correlation between the rate of capital adequacy and non-performing loans, ROA and ROE. Non-performing loans have a strong negative correlation with indicators of liquid assets share in total assets and liquid assets in long-term liabilities. Authors recommend that banks in Bosnia and Herzegovina should pay more attention to non-performing loans, which are one of the biggest dangers to their liquidity and stability.

Nikolov and Popovska–Kammnar (2016) analyze the non-performing loans in the Macedonian banking system and find that in a period of economic growth and higher inflation, non-performing loans are low and stable. The increase of the capital to asset

and return on equity ratios reduces the level of non-performing loans, as well. They conclude that as long as the economy is stable and banks are profitable and have adequate capital, non-performing loans are on a level suitable for the banks.

A lot of empirical literature is focused on examining the determinants of non-performing loans. Studies that investigate the impact of macroeconomic factors on non-performing loans include: Pesola (2001) for Nordic countries; Kalirai and Scheicher (2001) and Boss et al. (2002) for Austria; Delgado and Saurina (2004) for Spain; Bofondi and Ropele (2011) for Italy; Beck, Jakubik and Piloiu (2013) for EU countries; and they all confirm the impact of macroeconomic conditions on the movement and level of non-performing loans. In addition, most studied macroeconomic factors are: gross domestic product growth, unemployment rate, inflation rate, interest rates, credit growth and the exchange rate. In many papers, in addition to macroeconomic variables, the combined effect, i.e. their influence and specific banking determinants, has been examined (Dash and Kabra, 2010; Louzis, Voulsis and Metaxas, 2010; Zribi and Boujelbene, 2011; Castro 2012; Nikolaidou and Vogiazas 2014; Roman and Bilan, 2015). The most analyzed specific bank determinants are Capital Adequacy Ratio, rate of return on assets, rate of return on equity, cost structure, bank size, etc. However, all authors agree that different factors (of both macroeconomic and bank-specific nature) affect the emergence and growth of non-performing loans.

Non-performing loans and profitability in the banking system in the Republic of Macedonia

Credit activity has a dominant influence in the operations of Macedonian banks. In the period from 2007 to 2015, the domestic credit market noted favorable movement, although with different dynamics due to the developments in international financial markets, events in Greece, developments in the domestic economy and political conditions. Banks' credit activity towards the non-financial sector registered a continuous growth on an annual basis, although with different intensity. In 2015, a higher annual growth (9.7%) was realized in contrast to the lower credit growth in previous years.

The basic indicator of loan portfolio quality is the share of non-performing loans. When the global financial crisis effects were felt by the Macedonian economy, non-performing loans started to increase. With the slow recovery in 2010 and the following years, the growth of non-performing loans registered a slowdown. Thus, in 2015, the growth was 4.7%, which was at the lowest level in the post-crisis period after 2008. The slower growth of non-performing loans with less slower growth in banks' lending activity contributed to a decrease in the share of non-performing loans in total loans to 10.8% at the end of 2015.

Movements of total non-performing loans arise from the variable movement of non-performing loans in the corporate sector. They are the main drivers of non-performing loans with a share of around 80% in the total non-performing loans. These loans by default expose banks to an increased risk, considering the high amounts of

approved loans, the long maturity of loan repayment, the uncertainty of the economic environment in which companies operate. The non-performing loans of households are relatively small and stable. In 2015, these loans reduced by 0.1% (Graph 1).

Figure 1. Share of non-performing loans in total loans (for non-financial entities), in %
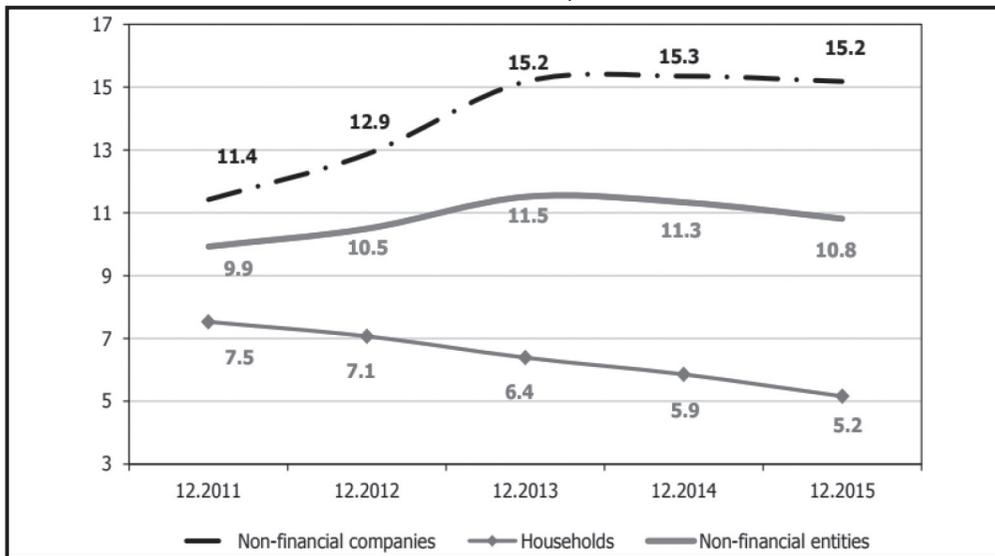
Source: NBRM, Report on the risks in the banking system of the Republic of Macedonia in 2015

The coverage of non-performing loans with the allocated impairment is high, which provides a satisfactory capacity of the banking system to absorb unexpected loan losses (on 31.12.2015, it was 86.7%). This arises from the faster growth of non-performing loans' impairment. The coverage of non-performing loans with its own impairment has registered a constant upward movement since the end of 2009 (74.4%), and at the end of 2015 it was 87.1%. High coverage provides significant resistance of the banking system to shocks. Thus, with an extreme assumption of impossibility of collecting non-performing loans in total, the capital adequacy ratio would be reduced by 1.3 percentage points (NBRM, Report on the risks in the banking system of the RM in 2015).

The pro-cyclical character of banks' operations is perceived not only through the movement of loans, but also through the profitability and efficiency of the banking system (Graph 2). The slowed down credit growth as a consequence of the global crisis caused a decrease in the net income of banks, while the deteriorated quality of loan portfolio caused a higher amount of impairment. These changes were reflected in the reduction of the financial position of banks. So, the profit realized in 2008 was about 7% lower compared to the profit in 2007, but the profit realized in 2009 was even 50% less compared to the previous year, as a result of the impairment allocated for the deteriorated loan portfolio quality. In 2010, the impairment significantly de-

creased (by 30.9%) compared to the previous year and it contributed to a 37.7% increase in profit compared to the previous year. In 2012 and in the following years, the profitability position of Macedonian banks continued to strengthen. And in 2015, the decreased loans impairment on a net basis, which corresponds to the almost double decreased annual growth rate of non-performing loans in 2015, had a positive impact on the financial result. The positive financial result was higher than the previous year by 47.3%.

In the past decade, the structure of bank income has changed, since net interest income occupies the place of the most important component, and thus has a dominant role in the revenue potential. If before the crisis, the net interest income accounted for less than half of the total revenues, in 2015 it made up about two thirds of the total revenue.

Most of banks' income is used to cover banks' operating costs, and then the impairment. The portion of the net interest income spent on covering the impairment of financial assets at the end of 2015 was 27.3%, as opposed to 31.12.2014 when it was 32.1%. In an environment of low and declining interest rates, one of the major challenges for banks in terms of profitability is their capacity for further maintenance of the growing net interest income.

**Figure 2.** The Basic profitability indicator and NPL ratio
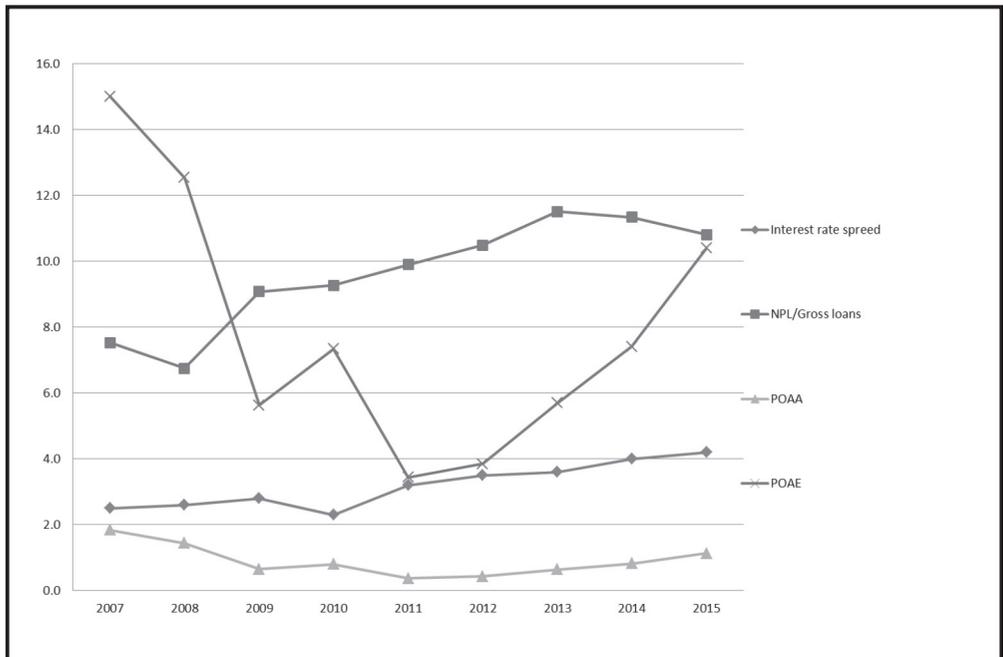
Source: NBRM

Different macroeconomic conditions, differences in local legislation and supervisory regulation create a different environment that, among other things, contributes to large variations in the level of non-performing loans in countries. Variations

exist not only between countries and between banks, but also within banking groups in their different geographical areas and different business orientations.

Macedonia, compared with CESEE countries with non-performing ratio of 10.3% is slightly above the average, but the non-performing coverage ratio (measured as the proportion of loan loss provisions to NPLs) is very high. Kosovo, Macedonia and Latvia have the highest NPL coverage ratio at 90.5%, 86.7% and 77.8%, respectively (Graph 3).

**Figure 3.** NPL ratio, coverage ratio and amount (%, € Bn, 31.12.2015)
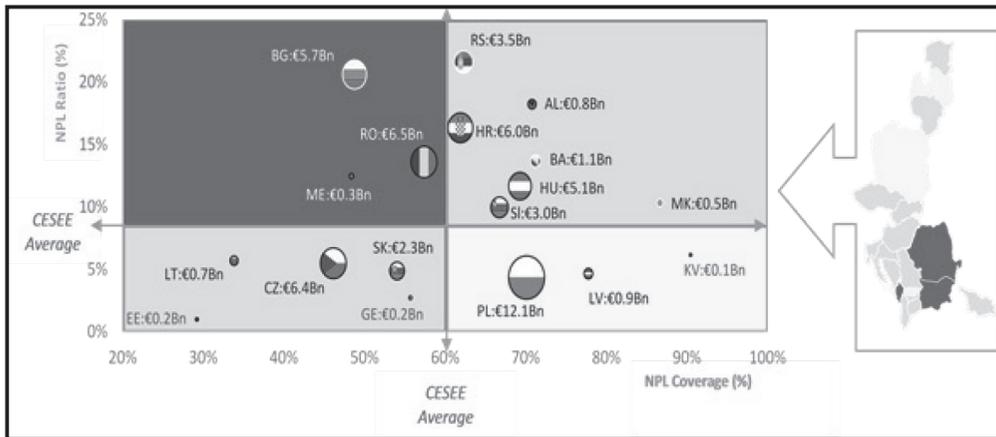
Source: Vienna Initiative, NPL Monitor for the CESEE, 2H 2016, p. 2

As of December 2015, non-performing loans in Central, Eastern and South Eastern Europe amounted to €55.5 Bn which equates to circa 5.1% of GDP or 7.7% of gross loans. Additional €129.2 Bn in NPLs were recorded in Cyprus, Greece and Ukraine as at December 2015. Despite the fact that the NPL ratio has decreased compared to the levels recorded in December 2014, NPL ratios remain persistently high, exceeding 10% in 10 of the 18 CESEE countries. Resolving the impediments to NPL resolution and transactions has remained at the top of the agenda of international financial institutions, regulators and banks across the countries.

Profitability ratios (Rates of return on assets and equity) place the banking system of the Republic of Macedonia in the middle of the list, as compared with the banking systems in the region and some EU member states (Graph 4).

Figure 4. Return on assets and return on equity, by country, in %
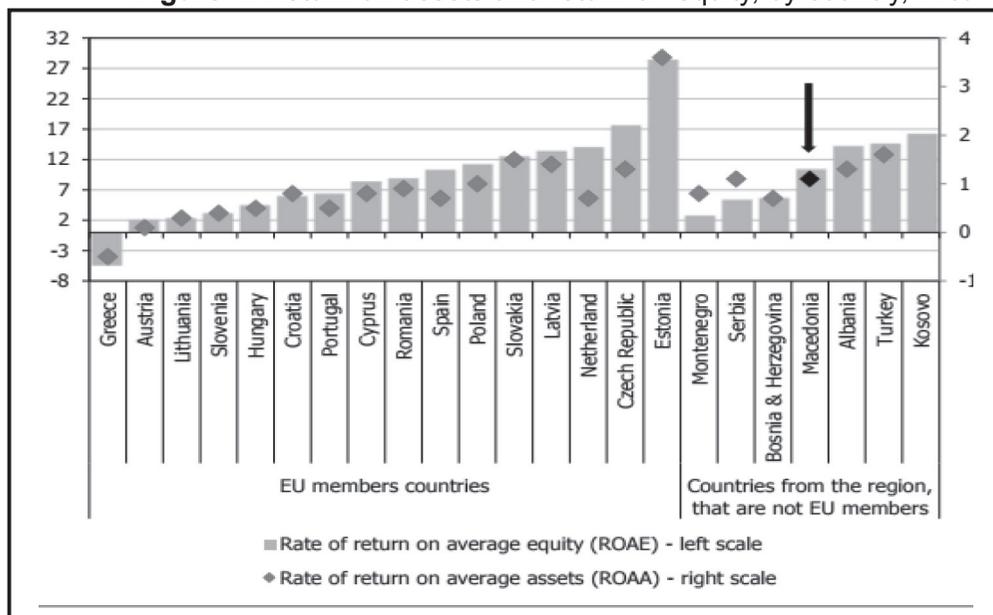
Source: NBRM, Report on the risks in the banking system of the Republic of Macedonia in 2015

Correlation and regression analysis of non-performing loans with basic profitability indicators

The demand for a more detailed analysis of banks' performance is increased in conditions of rapid changes in the economy and strong competition. Not only banks' shareholders, but also other market participants such as depositors, borrowers, regulators and competitors are interested in banks' performance. The financial result of the bank is calculated by various indicators and techniques, in order to analyze current and past trends, as well as future estimates for the bank's operations. One of the important analyses of the bank's success in managing the credit risk is determining the impact of non-performing loans on the bank's profitability indicators.

The starting point of analysis is the main financial indicators: the rate of return on average assets as an indicator to measure the effectiveness of using assets (ROAA), the rate of return on average capital to measure the performance of the bank in the use of equity (ROAE), the spread between the interest rate on loans and deposits in denars and the share of non-performing loans of non-financial entities in total loans to non-financial entities (households and the corporate sector) as a measure of loan portfolio quality. ROAA is the calculated net income to average assets and ROAE is the calculated net income to average capital for the banking system. In this research, the total amount of non-performing loans in the banking sector is used because the non-performing loans from the corporate sector have a dominant role with around 80% in determining the total amount of non-performing loans and the quality of credit portfolio.

The period for calculation is from 2007 to 2015. The calculated coefficients of correlation between the non-performing loans ratio and specific indicators showing the degree and direction of their connection are given in the following table:

Table 1. Coefficients of correlation

Indicators	Pearson correlation coefficient with the share of non-performing loans to total loans
Return on assets (ROA)	-0.666524
Return on equity (ROE)	-0.642901
Spread between interest rates on loans and deposits in denars	0.847784

Note: The author's calculations

Profitability indicators show moderately high negative correlations with non-performing loans ratio. Between the rate of return on assets (ROAA) and the non-performing loans ratio, there is a negative correlation of 0.67 indicating that the increased amount of non-performing loans has a significant impact on reducing the profitability ratio. Starting from the point that the rate of return on assets shows how much the management is efficient in generating revenues, it can be concluded that a higher indicator of non-performing loans contributes to reducing the effective management of funds.

The rate of return on equity (ROAE) and the non-performing loans ratio also have a moderately high negative correlation of 0.64. The correlation coefficient indicates that with increasing the non-performing loans ratio, the rate of return on equity is decreased.

Moderately high negative correlation has imposed the necessity to expand the analysis of these two indicators by applying the regression analysis technique. Regression analysis is a statistical method of determining the impact of changes in an independent variable on the changes of another dependent variable. The dependent variable is the indicator of return on assets (ROAA) and the independent variable is the indicator for share of non-performing loans in total loans. The regression equation is based on empirical data, and its calculation will determine how the change in the movement of non-performing loans affects the movement of the return on assets indicator.

On the basis of the calculation, the regression equation **$y = 2.779 - 0.195 x$** has been determined. The coefficient of determination is **R^2** = 0.444, meaning that 44.4% of the variations in the rate of return on assets are explained by changes in the non-performing loans ratio, indicating the statistical significance of the test. The regression equation calculation concludes that if the share of non-performing loans in total loans is increased by 1%, the indicator of return on assets will be reduced by 0.195 percentage points. The standard error of regression, or the unexplained variability, is 0.38.

Regression analysis was applied to determine the influence of the non-performing loans ratio on the rate of return on equity. The dependent variable is the rate of

return on equity and the independent variable is the non-performing loans ratio. The coefficient of determination is **R² = 0.4133.** It means that 41.3% of the variations in the rate of return on equity are explained by changes in the non-performing loan ratio.

From the regression equation **y = 22.755 - 1.5401 x**, it can be concluded that if the non-performing loans ratio is increased by 1%, then the rate of return on equity will be reduced by 1.54 percentage points.

Correlation and regression analyses confirm that problems related to non-performing loans may significantly affect the profitable position of banks.

The relatively high positive correlation between non-performing loans and the spread between the interest rate on loans and deposits in denars confirms the conclusion that the increase in interest rates increases the potential to worsen the creditworthiness of customers, who cannot service their increased obligations towards banks. With the untimely return of the debt increases the amount of non-performing loans.

With the application of simple statistical techniques, correlation and regression methods, the findings regarding the effects of non-performing loans on banks' performance are confirmed. One reason for the emergence and increasing presence of non-performing loans is the situation in the real sector or financial performance of the corporate sector. If the same statistical techniques are applied to determine the relationship of the non-performing loans ratio from the corporate sector with the indicator of equity return rate in the corporate sector, calculated for the period from 2010 to 2015, then Pearson correlation coefficient is 0.58. It shows a moderate negative correlation. The result of the correlation demanded an additional application of regression analysis. But now in the equation, the non-performing loans ratio is the dependent variable, while the rate of return on equity in companies is the independent variable. By calculating the data, the equation is as follows: **Y = 13.1 - 0.393 x.**

Therefore, if the rate of return on equity (as a profitability ratio of the corporate sector) is increased by 1%, it causes a decrease in non-performing loans of the corporate sector by 0.393 percentage points. Also, the calculation of the coefficient of correlation between the non-performing loans ratio from the corporate sector and the number of bankruptcies in the period from 2010 to 2015 is 0.476, indicating a moderate positive correlation. The increased number of bankruptcy procedures also increases the share of non-performing loans in total loans. By such statistical analysis, it is confirmed that the situation in the real sector is one of the most important factors affecting the movement and level of non-performing loans. Companies' problems caused by the loss of markets, declining production, rising inventories, the impossibility of selling their products can be reflected in the level of non-performing loans. It is not by chance that in conditions of economic crisis, the prudence of banks shall increase in relation to their lending activities, or they will not be able to inject fresh capital into the economy and slow down their credit growth by tightening the criteria for approving loans.

The deterioration in the capacity of households to repay their debt due to changes in income (interest rates or foreign exchange risks) can easily cause a rise in non-performing loans. The financial potential of the corporate sector and households' ability to gain regular income from operations and the level of their debt directly affects the operation or performance of banks. Therefore, monitoring the developments in the corporate sector and households on a regular basis is essential to the risks to which banks might be exposed, and to the economy's financial stability in general.

Conclusions

The effect of high numbers of non-performing loans is multiplied because it causes a disruption in all banking activities. The high amount of non-performing loans can cause deterioration in the profitable position, significantly reduce the financial result and reduce the capital base. At the same time, it is a limiting factor for the bank's future credit placements, growth and development. Also, the inability to collect claims increases the risk premium of banking products, raises the interest rates on loans, and thus, reduces the rate of credit growth. Therefore, the high level of non-performing loans contributes to an increased risk profile of the bank. Because of that, the resolution of non-performing loans is a key challenge for both banks and creators of the macroeconomic environment in the country.

Credit activity is a core banking operation in the Macedonian banking system. The share of non-performing loans in total loans is one of the basic indicators of credit portfolio quality. The results of correlation and regression analyses showed that there is a moderately high negative correlation between the non-performing loans ratio and rates of return on equity and return on assets. Increasing the amount of non-performing loans causes a decrease in the two main bank profitability indicators, ROAA and ROAE.

In order to minimize the negative effect of the increase in non-performing loans, banks lock out additional amount of capital, which remains "trapped" and reduces the rate of return on capital. In this way, the growth of non-performing loans has a twofold effect on the bank's profitability. First, it changes the structure of its financial position by reducing the profits (or increasing the losses), and slows down the rate of return on capital (because capital is used as a regulatory capital to cover the losses).

On the other hand, the deterioration of the return on equity indicator in the corporate sector causes an increase in non-performing loans, which confirms the fact that reduced profitability of companies could lead to a transformation of regular to non-performing loans.

Therefore, the resolution of non-performing loans is a necessary imperative for survival, prosperity and stable development of each banking institution. Problem or non-performing loans often have many dimensions and their resolution requires certain decisions of a systemic character. Starting from the causes of non-performing loans and the effects they have not only of the banking institution, but also on the banking system and whole economy, it is necessary to intensify the ways of solving them and adopt a comprehensive and integrated strategy at the national level.

This analysis can be the basis for further research and NPL causality examination. Further research can include the non-performing loans ratio analysis on the level of the bank in the banking system of the Republic of Macedonia, as well as an NPL analysis by type of activity for the corporate sector or type of credit products for households.

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Appendix 1

Regression analysis between non-performing loans ratio and rate of return on average assets (ROAA)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.666524088
R Square	0.44425436
Adjusted R Square	-1.285714286
Standard Error	0.385156298
Observations	9

ANOVA

	df	SS	MS	F	Significance F
Regression	9	0.830095	0.092233	5.59569	#NUM!
Residual	7	1.038418	0.148345		
Total	16	1.868512			

	Coefficients	Standard Err	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept							0	0
X Variable 8	2.779249371	0.804754	3.453541	0.01064	0.876309397	4.682189	0.876309	4.682189
X Variable 9	-0.195146842	0.082496	-2.36552	0.049934	-0.390219692	-7.4E-05	-0.39022	-7.4E-05

Regression analysis between non-performing loans ratio and rate of return on equity (ROAE)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.642901409
R Square	0.413322221
Adjusted R Square	-1.285714286
Standard Error	3.237898754
Observations	9

ANOVA

	df	SS	MS	F	Significance F
Regression	9	51.70275	5.744751	4.931592	#NUM!
Residual	7	73.38792	10.48399		
Total	16	125.0907			

	Coefficients	Standard Err	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
X Variable 8	22.75501138	6.765334	3.363472	0.012027	6.75754	38.75248	6.75754	38.7524831
X Variable 9	-1.540119889	0.693523	-2.22072	0.061812	-3.18004	0.099802	-3.18004	0.09980173

Regression analysis between non-performing loans ratio and rate of return on equity for the corporate sector

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.522503795
R Square	0.273010216
Adjusted R Squar	-1.5
Standard Error	0.816541415
Observations	1

ANOVA

	df	SS	MS	F	Significance F
Regression	6	1.001537	0.166923	1.502141	#NUM!
Residual	4	2.66696	0.66674		
Total	10	3.668497			

	Coefficients	Standard Err	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept							0	0
X Variable 5	13.13569101	2.134043	6.155308	0.003535	7.210638	19.06074	7.210638	19.06074
X Variable 6	-0.393422495	0.320999	-1.22562	0.287569	-1.28466	0.497814	-1.28466	0.497814