

## **THE IMPACT OF NON-PERFORMING LOANS ON HOUSEHOLDS ON THE FINANCIAL PERFORMANCE OF BANKS IN MACEDONIA<sup>1</sup>**

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### **ABSTRACT**

The credit portfolio in banks with the traditional model of banking has dominant role in the banks' operations and. Loan portfolio quality it is the main generator of the banks' results. The basic indicator for quality of the credit portfolio is the share of non-performing loans to total credit portfolio. Very often, the NPL loans are also a source of other risks, as liquidity risk and solvency and increase the risk profile of the bank. This paper investigates the influence of the non-performing ratio on households on the financial performance of banking system in the Republic of Macedonia for the period 2010-2017. The analysis presents correlation and regression between non-performing loan ratio on households and profitability indicators: rate of return on assets and rate of return on equity, as well as the capital adequacy. The results of correlation shows 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 to reduce the bank profitability.

**KEY WORDS:** non-performing loans, banks, credit portfolio, profitability, capital adequacy

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<sup>1</sup>Original scientific article

## INTRODUCTION

In the banking system with dominant traditional activities, the loan portfolio has a superior role in the business policy of the 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 the banks. The manifestation of the credit risk expressed as impossibility of the loans to be fully or partially paid by the borrowers within the conditions noted in the loan agreement means loss for the bank. Non-performing loans are loans when 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 the credit portfolio of the banks.

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 on reducing market confidence in the bank, increasing reputational risk and contributing to depositors to withdraw deposits or increasing funding costs. Also, a high amount of non-performing loans is one of the main reasons of systemic insolvency of the banking sector, which presents a threat and an obstacle not only for the development of the banking system, but in the economic system as a whole.

Given the fact that exposure to credit risk is a leading source of problems in banks, the analysis of the causes and consequences of non-performing loans is justified. The paper analyzes non-performing loans as a most essential part of loan portfolio with 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. With statistical methods (correlation and regression), it is confirmed the significant impact of the non-performing loans on banks' profitability indicators and capital adequacy. The paper is organized as follows. First, it gives a brief overview of the previous findings regarding the non-performing loans, especially households (determinants and consequences). Second, it reviews an analysis of non-performing loans in the Macedonian banking system. Third, it conducts statistical analysis on the non-performing loans and profitability indicators and capital adequacy on the banking sector in the Republic of Macedonia, and, finally, it offers some conclusions.

## LITERATURE REVIEW

A high or increasing ratio of non-performing loans in the banking sector may threaten financial stability, impede the intermediation of funds from savers to borrowers, and possibly lower investments with implications for long-term growth. This makes it important to identify the drivers of non-performing loans and how the drivers affect non-performing loans in the future. Non-performing Loans (NPLs) has attracted a great deal of interest among researchers and policy makers during the last four decades as these increasing nonperforming loans are causing banking crisis which are turning into banking failures (Barr and Siems, 1994). Conducting a study on the Nordic banking system over the period 1993–2005, Berge and Boye (2007), concluded that problem loans are significantly linked to both the real interest rates and unemployment.

As many literatures shows, there have been an increased number of significant bank problems both at matured and emerging economies (Tendia et al. 2012). Banking sectors can perform worst as a result of inefficient management, low capital adequacy and poor assets quality. Nonperforming assets is also the single largest cause of irritation of the banking sectors (Sontakke and Tiwari, 2013). Deterioration in asset quality is much more serious problem of bank unless the mechanism exists to ensure the timely recognition of the problem. It is a common cause of bank failure. Poor asset quality leads nonperforming loan that can seriously damage a banks' financial position having an adverse effect on banks operation (Lafuente, 2012).

The growth of households' debt is also affected by excessive consumption as a consequence of expectations of fast-growing incomes (Herceg and Šošić, 2011). With the onset of the financial crisis in 2008, the vulnerabilities of banks were revealed and the upward trend of non-performing loans (NPL), commonly used as a measure of credit risk, started. This has become a significant problem especially because the changes in NPL are correlated with the negative GDP growth (Klein, 2013).

Lawrence (1995) showed that borrowers with low incomes have higher rates of default due to increased risk of facing unemployment and being unable to pay. An increase in the unemployment rate could influence negatively the present and future purchasing power of households and consequently increase the debt

burden. Accordingly, in periods of high economic growth and low unemployment rates borrowers are more able to support debt, consequently resulting in the decline of NPLs (Bofondi and Ropele, 2011).

Castro (2012) indicated that deterioration of financial conditions contributes significantly to increasing the rate of NPLs. Similarly, increases in real wealth as proxied by house prices may improve the quality of loans. As loans for house purchases are usually mortgage loans, rising house prices reduces the probability of defaulting of households as they can sell their houses and end the loan without defaulting. Therefore, changes in equity or house prices are expected to be negatively associated with the level of NPLs (Shu, 2002).

Bernanke and Gertler<sup>2</sup> connect the quality of credit portfolio with business cycles. Namely, as the economy enters into a recession goes down the ability of the borrower to pay the loan. Uncertainty about the future is forcing the companies to refrain from investing in new capacities and decrease the future, potential yield as well as their financial power. On one hand, companies cannot repay their loans, have difficulties with loan payment and regular loans are transferred to non-performing loans. At the other hand, the disposable income of the households decreases and uncertain future makes difficult the selection of households between current and future consumption.

According to Gup and Kolari<sup>3</sup>, 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: the shocks in interest rates, changes in tax laws etc. resulting 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<sup>4</sup> find that situation in the banking system affects the overall economy in the country, because banks are source of funding for better work opportunities, developing new ideas, research and overall prosperity. The most important

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<sup>2</sup>Bernanke, B. and Gertler, M., (1989), “*Agency Costs, Net Worth and Business Fluctuations*”, The American Review, 79 (1), pp14-31.

<sup>3</sup>Gup, B. and Kolari, G. „*Commercial banking- Risk management*“, Skopje, Ars Lamina, translation into Macedonian language, 2005.

<sup>4</sup>Dreca, N., “*Evaluation of Financial Performance of Banking Sector: Evidence from Bosnia and Hercegovina, Croatia, Serbia and Slovenia*”, Journal of Economic and Social Studies, available at: <http://eprints.ibu.edu.ba/1389/1/2012>.

factors that affecting bank operations are: the size of the bank measured by its total asset, profitability measured by the indicator of return on assets and return on equity, the size of deposits and loans and the indicator for participation of non-performing loans to total loans. According to Stuti and Bansal (2013), the best indicator of the health in banking industry 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 the 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 at the movement of non-performing loans in various banks and the level of non-performing loans is determinate by internal factors of the banks. According to Adhikary<sup>5</sup> reasons for non-performing loans are usually associated with a lack of effective monitoring and supervision of the banks, lack of effective resources in banks, weaknesses in the legal system and the lack of effective strategies for debt collection.

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<sup>6</sup> point out that 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 have double obstacle to the development of the financial sector. Due to the high share of problematical loans, banks raise interest margins in order to protect from the risks of possible write-off of loans. Based on surveys conducted in 19 countries in transition in the period from 1991 to 1997, he found that one percentage point increase in the level of non-performing loans result in a 0.9 percentage point increase in the range of interest rates. At other side, the high level of problematical loans reduces the confidence in the banks and financial sufficient do not invest surplus funds in banks causing additional problems on the performance of the operations in banking sector.

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<sup>5</sup>Adhikary, B.K, *Non-performing Loans in the Banking Sector of Bangladesh: Realities and Challenges*, Bangladesh Institute of Bank Management, 2007.

<sup>6</sup>Rother., P.C. "Explaining the Behavior of Financial Intermediation: Evidence from the Transition Economies", IMF Working Paper No.36, 2010.

Hou and Dickinson<sup>7</sup> noted that impairment for problematical loans reduces the solvency position and risk profile of banks. Refraining from lending, through reduced consumption and failed companies, further reduces economic activity and this reduced economic activity causes a larger amount of non-performing loans. Thus it is created a spiral that 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 are explained by the fact that starting from desire for achieving the greater market share banks approve riskier loans and relax their criteria for lending.

The process of deregulation impacts on increasing competition among banks (Salas and Saurina,<sup>8</sup>). Many authors determinate that the increased competition among banks affects increasing banks' exposure to credit risk, i.e. the reduction in the quality of credit portfolios as a result of the relaxation of the standards and criteria for lending in order to collect greater credit market share ( Jeong and Jung, 2013; Bolt and Tieman)<sup>9</sup>.

Podpiera and Weill<sup>10</sup> 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 regulatory institutions to focus on strengthening management performance in order to strengthen the stability of the financial system.

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<sup>7</sup>Hou, Y. and Dickinson, D. “*The non-performing loans: some bank-level evidences*”, 2007.

<sup>8</sup>Salas, V. and Saurina, J. “*Credit Risk in Two Institutional Regimes: Spanish Commercial and Saving Banks*”, *Journal of Financial Services Research*, Vol.22:203-224, 2002.

<sup>9</sup>Jeong, S. and Jung, H “Bank Wholesale Funding and Credit Procyclicality: Evidence from Korea”, *Panoeconomicus*, pp. 615-631 . 2013, available at: [http://www.panoeconomicus.rs/casopis/2013\\_5/03%20Sangjun%20Jeong%20and%20Huechae%20Jung.pdf](http://www.panoeconomicus.rs/casopis/2013_5/03%20Sangjun%20Jeong%20and%20Huechae%20Jung.pdf).

<sup>10</sup>Podpiera, J. and Weill, L., “*Bad luck or bad management? Emerging banking market experience*”, *Journal of Financial Stability* 4, pp.135-148, 2008.

Kozaric and Zunic<sup>11</sup> 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 bank's exposure to risk are used indicators of profitability ROA and ROE, risk weighted assets, the share of loans in total assets, the ratio of loans/deposits, ratio for the share of liquid assets in total assets and liquid assets terms of long-term obligations. They conclude that there is 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 participation of liquid assets 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 for their liquidity and stability.

A number of empirical literature is focused to examine the determinants of non-performing loans. The studies that investigate the impact of macroeconomic factors on non-performing loans are included: 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<sup>12</sup> for EU countries and they all confirm the impact of macroeconomic conditions on the movement and the level of non-performing loans. In addition, most studied macroeconomic factors are: the growth of gross domestic product, unemployment rate, inflation rate, interest rates, credit growth and the exchange rate. In many papers, despite macroeconomic variables has been examined the combined effect, their influence and specific banking determinants (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, from macroeconomic and bank-specific nature, affect the emergence and growth of the non-performing loans.

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<sup>11</sup>Kozaric, K. and Zunic, E. "Causes and Consequences of NPLs in Bosnia and Herzegovina Banking Sector", Journal of Economic and Social Studies, Volume 5, Nr.1, 2015.

<sup>12</sup>Beck, R., Jakubik, P. and PiloIU, A. "Non-performing loans What matters in addition to the economic cycle?" , Working Paper Series, No1515, European Central Bank, 2013.

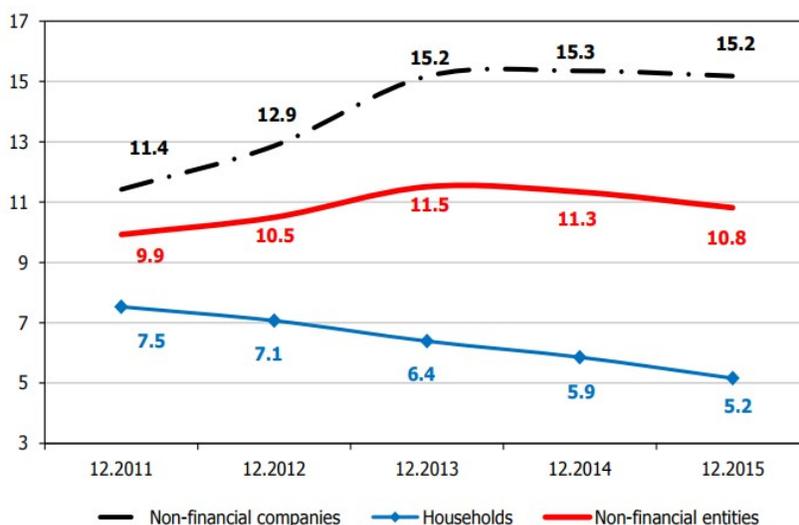
## NON-PERFORMING LOANS AND PROFITABILITY IN THE BANKING SYSTEM IN THE REPUBLIC OF MACEDONIA

Credit activity has a dominant influence in the operations of Macedonian banks. In the period from 2010 to 2016, the domestic credit market has noted favorable movement, although with different dynamics due to the developments in the international financial markets, the events in Greece, developments in the domestic economy and political conditions. The banks' credit activity towards the non-financial sector, on an annual basis, has registered continuous growth, although with different intensity.

The basic indicator for the quality of the loan portfolio is the share of non-performing loans. When the effects from the global financial crisis were felt by the Macedonian economy, the non-performing loans started to increase. With the slow recovery in 2010 and the following years, the growth of non-performing loans has registered slowdown. Thus, in 2015, growth is 4.7%, which is the lowest rate in the post-crisis period after 2008. The slower growth of non-performing loans with less slower growth in the lending activity of the banks 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 to the corporate sector. They are main driver of non-performing loans with a share of around 80% in the total non-performing loans. These loans by default expose banks to increased risk considering the high amounts of approved loans, the long maturity for repaying loans, the uncertainty of the economic environment in which companies operate. The non-performing loans of the households are relatively small and stable. In 2015, these loans reduced by 0.1% (Graph 1).

Graph1. 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 2017

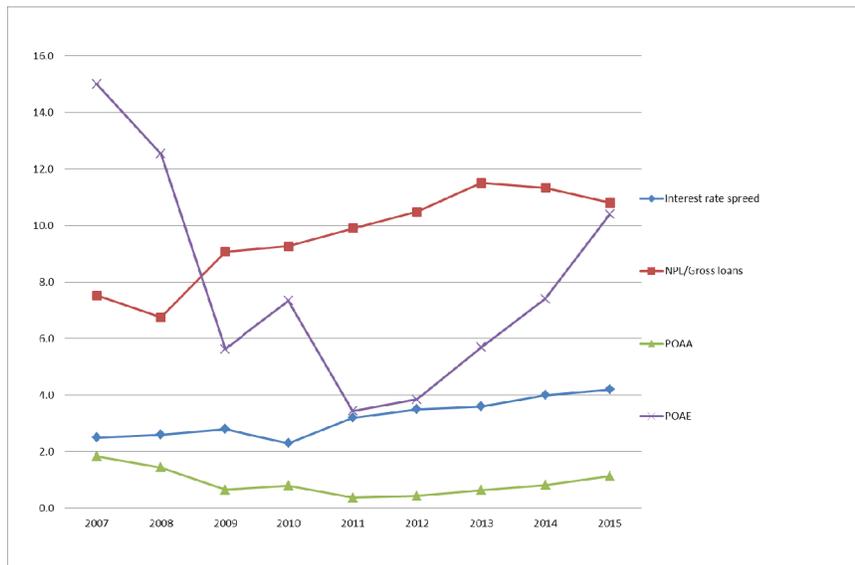
The coverage of non-performing loans with the allocated impairment is high, which provides a satisfactory capacity of the banking system to absorb unexpected loan losses. This arises from the faster growth of the impairment of the growth of non-performing loans. High coverage provides significant resistance to the banking system of 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.<sup>13</sup>

The pro-cyclical character of the 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 the banks, and the deteriorated quality of the loan portfolio caused a higher amount of impairment.

<sup>13</sup>National Bank of the Republic of Macedonia, *Annual reports for banking system of Republic of Macedonia 2009, 2010, 2011, 2012, 2013, 2014 u 2015 year*, available at [www.nbrm.mk](http://www.nbrm.mk)

These changes were reflected in the reduction of the financial position of banks. In 2010, the impairment significant decreased (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 impairment of the loans on a net basis, which corresponds to the almost doubled decreased annual growth rate of non-performing loans in 2015, had a positive impact on the financial result. The financial positive result is higher for 47.3% than previous year. 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 the 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 creates about two thirds of the total revenue.

Graph 2. The Basic profitability indicator and NPL ratio



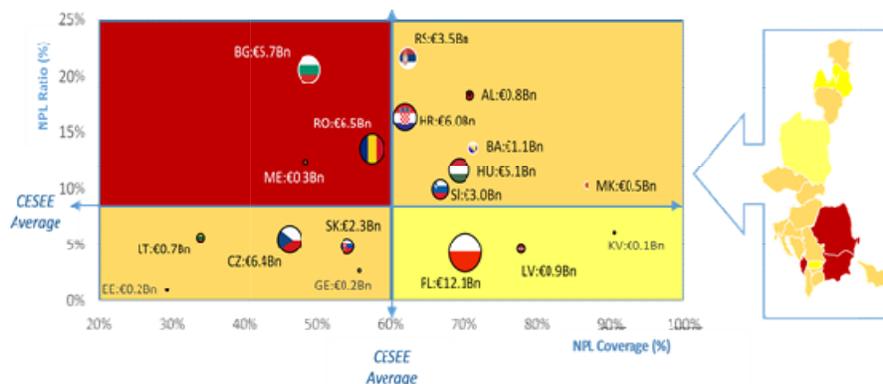
Source: NBRM

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 from 10,3% is a little 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)<sup>14</sup>.

Graph 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 NPL ratio has decreased compared to levels recorded in December 2014, NPL ratios remain persistently high, exceeding 10% in 10 of the 18 CESEE countries. Resolving impediments

<sup>14</sup> Cloutier, E., *NPL Monitor for the CESEE, 2H*, Vienna Initiative, pp. 2-3, 2016.

to NPL resolution and transactions has remained at the top of the agenda of international financial institutions, regulators, and banks across the countries.

#### CORRELATION AND REGRESSION ANALYSIS OF NON-PERFORMING LOANS WITH BASIC PROFITABILITY INDICATORS

The request for a more detailed analysis of the banks' performance is increased in conditions of rapid changes in the economy and strong competition. Not only bank's shareholders, but also other market participants such as depositors, borrowers, regulators, and competitors are interested for the bank's performance. The financial result of the bank is calculated by various indicators and techniques, in order to analyse 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 the non-performing loans on the bank's profitability indicators.

The starting point of the analysis is the main financial indicators: 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 quality of the loan portfolio.<sup>15</sup> ROAA is calculated net income to average assets and ROAE is calculated net income to average capital for banking system. In the research is used the total amount of non-performing loans in the banking sector because the non-performing loans from corporate sector have dominant role with around 80% in determining the total amount of non-performing loans and the quality of the 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 that show the degree and direction of their connection are given in the following table:

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<sup>15</sup>Jolevski, Lj., "The reasons and consequences of non-performing loans. The case of the Republic of Macedonia", Skopje, UKIM, master thesis, 2016.

Table1.Coefficients of correlation

<b>Indicators</b>	<b>Pearson correlation coefficient with the share of non-performing loans to total loans</b>
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 authors' 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 has a negative correlation of 0.67 indicating that the increased amount of non-performing loans have significant impact on reducing the ratio of profitability. Starting from the point that the rate of return on assets shows how the management is efficient in generating revenues, it can be concluded that 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 coefficient of correlation indicates that with increasing the non-performing loans ratio, the rate of return on equity decreased.

Moderately high negative correlation has imposed the necessity to expand the analysis of these two indicators by applying the technique of regression analysis. Regression analysis is a statistical method of determining the impact of changes in an independent variable on the changes of another dependent variable. Dependent variable is the indicator of return on assets (ROAA) and the independent variable is the indicator for share of non-performing loans to 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 has affected the movement of the indicator of return on assets.

On the basis of the calculation has been determined the regression equation  $y = 2.779 - 0.195 x$ . 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 calculation of the regression equation conclude that if the share of non-performing loans to total loans is increased by 1%, the indicator of return on assets will be reduced by 0.195 percentage points. The standard error of the regression, or the unexplained variability, is 0.38. The F statistic is 5.59 meaning that the regression is statistically significant.

Regression analysis was applied to determine the influence of the non-performing loans ratio on the rate of return on equity. Dependent variable is the rate of return on equity and independent variable is non-performing loans ratio.. The coefficient of determination is  $R^2 = 0.4133$ . 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  $y = 22.755 - 1.5401x$  can conclude 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 analysis confirms that problems related to non-performing loans may significantly affect the profitable position of banks. 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, that can not service their increased obligations towards banks. With the untimely return of the debt increases the amount of non-performing loans.

The achieved results can be compared with the results in similar studies conducted in the Republic of Macedonia. The conclusions are almost the same. For example, Iloska<sup>16</sup> concludes that banks in Macedonian banking system tend to be more profitable when they are able to undertake more lending activities,

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<sup>16</sup>Iloska, N., "An Analysis of Bank Profitability in Macedonia" *Journal of applied economics and Business*, Vol.2, ISSUE 1, pp. 31-50, 2014.

yet due to the credit quality of lending portfolios, a higher level of provision is needed. Such a high level of provisions against total loans in fact affects the performance of banks adversely. Banks, therefore, need to improve profitability by improving screening and monitoring of credit risk.

Davcev and Hourvoulides<sup>17</sup> find out significance relationships of the return on assets and return on equity ratios with the equity size, loan loss and operating expenses in the banks.

Spaseska<sup>18</sup> investigate the bank internal determinants on profitability and conclude that total loans, asset quality (non-performing loan to total loan ratio), capital adequacy and total deposit to total assets have more effect than macroeconomic factors on profitability of the banks.

With the application of simple statistical techniques, correlation and regression method, the findings of the consequences of non-performing loans on the performance of banks 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 for return rate of equity in the corporate sector, calculated for the period from 2010 to 2015, Pearson correlation coefficient is - 0.58. It shows moderate negative correlation. The result of the correlation turned an additional application of regression analysis. But now in the equation, non-performing loans ratio is dependent variable, while the rate of return on equity in companies is an 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 ratio of profitability of the corporate sector) is increased by 1%, causes decreasing in non-performing loans of 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

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<sup>17</sup>Davcev, L. and Hourvoulides, N. "Profitability Parameters in the Banking System of Macedonia" Proceedings: International Conference on Applied Economics 2009. pp. 133-141. ISSN 1791 – 9347, 2009.

<sup>18</sup>Spaseska "Determinants of banks' profitability in Republic of Macedonia", *Annals of the „Constantin Brâncuși” University of Târgu Jiu, Economy Series*, Issue 2/2017.

is 0.476, indicating a moderate positive correlation. With rising bankruptcy procedures increase and share of non-performing loans to total loans. By statistical analysis is confirmed that the situation in the real sector is one of the most important factors affecting movement and the level of non-performing loans. Their 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. Not by chance, in the conditions of economic crisis increases prudence of banks in relation to its lending activities, or they are not will to inject fresh capital into the economy and slow down their credit growth by tightening of 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 the banks. Therefore, monitoring the developments in the corporate sector and households on a regular basis is essential for the risks that might be exposed banks, and in general financial stability in the economy.

## CONCLUSIONS

The effect of the high amount 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 capital base. At the same time, it is also a limiting factor for the bank's future credit placements and its growth and development. Also, the inability to collect claims increases the risk premium of the banking products, raises the interest rates on loans, and thus also reduces the rate of credit growth. Therefore, the high level of non-performing loans contributes to increase risk profile of the bank. Because of that, the resolution of non-performing loans is a key challenge for the banks and creators of the macroeconomic environment in the country.

The credit activity is a core banking operation in Macedonian banking system. The share of non-performing loans to total loans is one of the basic indicator for

the quality of the credit portfolio. The results of correlation and regression analysis 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 in the amount of non-performing loans, cause reducing of the two main indicators of bank profitability, 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 have twofold effect of the bank's profitability. First, it change the structure of its financial position by reducing the profit (or increasing losses), and slow down the rate of return on capital (because capital is used as regulatory capital to cover the losses).

On the other hand, the deterioration of the indicator of return on equity in the corporate sector cause an increase in non-performing loans, which confirms that the reduced profitability for 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 of non-performing loans often have many dimensions and their resolution requires certain decisions of systemic character. Starting from the causes of non-performing loans and the consequences that they have not only of the banking institution, but also for the banking system and whole economy, it is necessary to intensify the ways to solve them and adoption of a comprehensive and integrated strategy at state level.

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#### Anex

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	andard Err	t Stat	P-value	Lower 95%	Upper 95%	lower 95.0%	pper 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

<i>Regression Statistics</i>									
Multiple R	0.642901409								
R Square	0.413322221								
Adjusted R Square	-1.285714286								
Standard Error	3.237898754								
Observations	9								

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>gnificance F</i>
Regression	9	51.70275	5.744751	4.931592	#NUM!
Residual	7	73.38792	10.48399		
Total	16	125.0907			

	<i>Coefficients</i>	<i>andard Err</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>ower 95.0%</i>	<i>pper 95.0%</i>
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 corporate sector

SUMMARY OUTPUT

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

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>gnificance F</i>
Regression	6	1.001537	0.166923	1.502141	#NUM!
Residual	4	2.66696	0.66674		
Total	10	3.668497			

	<i>Coefficients</i>	<i>andard Err</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>ower 95.0%</i>	<i>pper 95.0%</i>
Intercept					0	0	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