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IMPACT OF NONPERFORMING LOANS ON PROFITABILITY ON THE BANKING SYSTEM IN THE REPUBLIC OF NORTH MACEDONIA

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Abstract

Banks are the most important participants in the financial system, but also the most significant and largest financial institutions around the world, measured through their share in the total financial sector assets. Banks play a significant role in economic growth, namely by diversifying the risk to their activity. Interest rate risk is one of the most important financial risks of each bank which the banks face. Each risk is in itself a direct or indirect negative impact on the profit, activity, or realization of the ultimate goal of the banks. The risk of a change in interest rates in the portfolios of banking activities is a risk of loss arising from unfavourable changes in interest rates, as seen by the bank.

The research in this paper concentrates on several directions with a common goal - the role and the need for bank profitability in today's conditions. The main research question is if in the research is a significant link between non-performing loans and bank profitability?

Based on these goals, the research pays special attention to the importance of the asset management companies, from which we determine the determinants of the profitability of the banking system and we analyzed them from 1998 to 2016. For this purpose, we used Ordinary Least Square the method with the determination of the determinants, where it is noted that the non-performing loans showed a negative correlation with the level of the profitability in the Republic of North Macedoniaand are statistically significant.

It is recommended that regulators draw up regulations and monitoring tools that will cause early warning signals about possible failures of the bank due to accumulation of non-performing loans.

Keywords:*Bank, Regulation, Profitability of banks, ROA, Economic.*

1. Introduction

Banks are the most important players in the financial system, but also the most important and largest financial institutions around the world, measured through their share in the total assets of the financial sector. The banking system is the most important part of the total financial system in the Republic of North Macedonia, because 90% of the total assets of the financial system belong to banks.

Banks play a significant role in economic growth, namely through the diversification of the risk for their activity. Interest rate risk is one of the most important financial risks of each bank that banks face. Each risk in itself represents direct or indirect negative impact on the profit, activity or realization of the final goal of the banks. As seen by the bank, the interest rate risk in the banking activities represents a risk of loss arisingfrom unfavourable interest rate changes.

The research in this paper concentrates on several directions, but at the end there is a common goal - the role and the needfor bank profitability in today's conditions. Special attention is paid to the role of banking regulation regarding competition and financial stability.In this way, the research on the impact of non-performing loans (NPL) appears to be important in the assessment of ROA. The main research question is:what is the impact of non-performing loan on the bank profitability in Republic of North Macedonia?To respond to that question, this paper is organized into six sections.

The research is structured in this way. The introduction belong insection one. In section two is done discussionreview of literature on bank profitability. Section three describes the performance indicators under study in the banking system in Republic of North Macedonia. Section four coincides with the description of the data obtained in the study and was analyzed the methodology used, while in section five will be presented the main results identified through linear regression model. In section six will discuss the results of the study and the conclusion of the research.

The methodology of research is based on the time series method by the Ordinary Least Square. The data used are from 1998 to 2016. The main objective of the research is to analyze the impact of non-performing loans on the progress of profitability in the banking system of the Republic of North Macedonia.

2. Literature Review

Banks play an important role in the financial market. However, to function normally they must be safe and to be perceived as such.Banks play a significant role in economic growth, namely through the diversification of the risk for their activity and also they play a significant role in the financial market. Why is important to determine the determinants of the profitability of the banks in the Republic of North Macedonia? Knowing these factors would help in the future easier to overcome potential negative shocks and maintain the financial stability of the banking system in the Republic of North Macedonia. The assessment of all-round banking operations as well as monitoring their financial situation is important for depositors, potential investors, managers and of course, regulators.

Historically, the incidence of banking sector failure resulted from insolvency which has often been associated with massive accumulation of non-performing loans (Fofack, 2005). When banks lend out money, they do it with the hope that their borrowers will make their payments as scheduled, but that doesn't always happen. Sometimes borrowers run out of money or fall into situations where they can't repay their debt, and that's how non-performing loans become a problem for so many banks. A non-performing loan, or NPL, is one that is in or close to fail.This typically happens when principal and interest payments on the loan are overdue by 90 days or more. Non-performing loans are generally considered bad debt because the chances of them getting paid back are minimal. The more non-performing loans a bank has on its books, the more stock price is likely to be affected more. (According to this web: The Motley Fool).Samir and

Kamra (2013) argue that non-performing loans have a deleterious impact on bank profits as they reduce interest income and erode current profits and capital base through provisions.

Non-performing loans are considered determinants of profitability because, high levels of non-performing loans adversely affect bank net profit through provisioning of doubtful debts and write-offs of bad debts, which normally affect profitability (Ombaba, 2013). Subsequently, the moment when non-performing loans exceed bank capital in a relatively large number of banks, it comes in banking crisis, which eventually turns into a financial crisis (Biabani 2012 and Karim 2010).

In addition to non-performing loans, the GDP growth is also used to illustrate the relationship between GDP and profitability in the banking system, which has been analyzed by many authors, including Demirguc-Kunt and Huizinga, 2000.

3.A Brief Review of the Developments in the Domestic Banking System in 2017

According to National Bank of the Republic of North Macedonia, the activities of the banks in 2017 had different tendencies in the first and in the second half of the year. In the first half of 2017 the activities of the banks were under the influence of the reduced economic activity and the still were present risks from the domestic political events and the global environment. The total assets of the banks in this period featured modest growth which was primarily due to the decline in the deposit potential of the banks in the first quarter of 2017 and due to the minimal growth in the second quarter of the year. The gradual stabilizing of the situation and the ascertainment's of the economic entities in the second half of 2017 has relevant impact on the positive tendencies on the foreign currency market and on the upward tendency of the deposit base of the banks, mainly from the households. The dynamics of the credit activity of the banks followed to a large extent the tendencies of the deposits. The credit growth was due to the increased credit support of the banks to the households sector, but also due to the growth in the crediting of the corporate clients.

In a situation of moderate healing of the domestic economy and stabilization of the expectations and the trust of the economic entities, the crediting to non-financial entities[1] featured growth in 2017 for5.9%.

Graph 1. Annual growth of the loans to non-financial entities
In millions of denars

[1] The loans of non-financial entities include the loans of non-financial entities-residents and non-residents, which includes loans to private and public non-financial companies, central government, local self-government, non-profit institutions serving households (loans to other clients), sole proprietors and individuals (loans to households).

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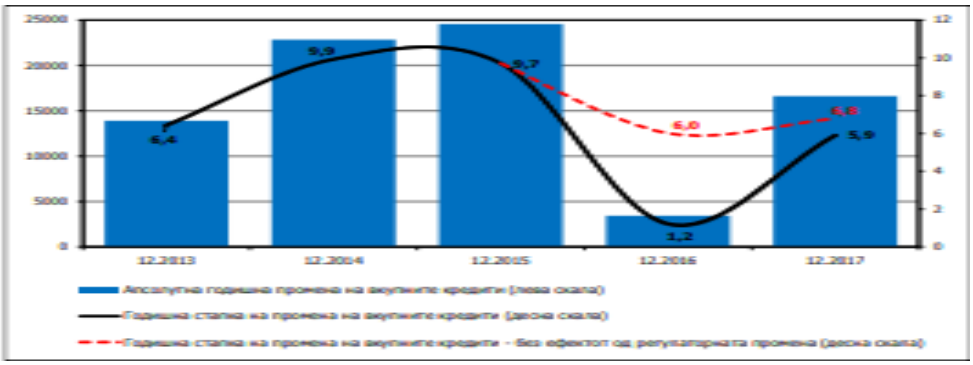

Source: NBRNM, using data provided by the banks (2013-2017).

The banking system increased the profits in 2017 as well, albeit with far less growth rate compared to the last years. The largest contribution to the increase of the profit in 2017 was provided by the non-interest revenues, contrary to the usual trend from the last years when the net interest income was the continuous main contributor to the growth of the profit.

In 2017 the banking system generated profit of 6.6 billion denars, which is more by 230 million denars i.e. 3.6% in comparison to the profit realized in 2016. The annual growth of the profit features certain slowdown compared to the last five-year period (2011 - 2016), when it was growing at an average of 40% per year.

The significantly slower growth of the profit in 2017 had influence on the indicators of profitability and efficiency of the banking sector. Following several years of continuous growth, the rates of return on average assets, the average equity and reserves featured minimal decline of 0.1 percentage point each and in the end of 2017 they are 13.5% and 1.4%, respectively. The analysis of particular components of the rate to return points out to certain decline in the profit margin and in the turnover of the average risk-weighted assets, which also contributed to the minimal decline of the rates of return.

4. Data and Methodology

4.1. Methodology

The primary objective of this study is to identify and evaluate an econometric model to assess the links between dependent and independent variables. Primary data in this study are derived from secondary sources, mainly identified from annual reports and statistics published by the National Bank ofthe Republic of North Macedonia,World Bank, FRED Economic data | ST. Louis FED, different data and information reports.

The methodology of research is based on the time series method by the Ordinary Least Square. Identified data are processed by the statistical program Eviews 9.0. Initially, the relevant tests have been developed for evaluation of variables and construction of the final model of linear equation. The data used are annual, from 1998 to 2016 andthe main objective of the research is to analyze the impact of non-performing loans (NPL) on the progress of profitability in the banking system of the Republic of North Macedonia.

This research adopted causality research design and deductive research strategy. The causality research design has been chosen because: The study attempted to test and analyze the relationship among hypothesized variables, the design helps to find empirical association between the independent variables and a dependent variable.

This research used descriptive analysis and multiple regression analysis methods to analyze data. To ensure that the sample matched with multiple methods of regression analysis, data was tested for normality, multi co-linearity and heteroskedasticity. No significant violations were found.

Based on these goals, the research pays special attention to the importance of the asset management companies, from which we determine the determinants of the profitability of the banking system and we analyzed them from 1998 to 2016. For this purpose, we used Ordinary Least Square method for the determination of the determinants, where Return on asset (ROA) is dependent variable and Non-performing loans, Liquid liabilities to GDP and GDP growthrepresent independent variable.A regression model is estimated to examine the relationship between NPL and ROA. The model is expressed as:

$$\boldsymbol{ROA_t = \beta_0 + \beta_1 NPL + \beta_2 LL + \beta_3 GDPg + u_t} \qquad \textbf{(1)}$$

Whereas:β_0 = Constant parameter;

β_{1-3} =Coefficients of independent variables;

u_t = Represents the unexplained residual and t = time.

where, ROA: *Return on assets (dependent variable),*NPL: Non-Performing Loans, LL: Liquid liabilities to GDP and GDPgrowth: GDP growth. According to these data, hypotheses are:

Effect of NPL on bank profitability in Republic of North Macedonia:

$\mathbf{H_0}$. The non-performing loans has a positive effect on bank profitability (ROA) in Republic of North Macedonia;

$\mathbf{H_1}$**.** The non-performing loans has a negative effect on bank profitability (ROA) in Republic of North Macedonia.

Effect of Liquid liabilities to GDP on bank profitability in Republic of North Macedonia:

$\mathbf{H_0}$.Liqud liabilities affect bank profitability in Republic of North Macedonia;

$\mathbf{H_1}$.Liqud liabilities do not affect bank profitability in Republic of North Macedonia.

Effect of Economic growth on bank profitabilityin Republic of North Macedonia:

$\mathbf{H_0}$. Economic growth affects bank profitability in Republic of North Macedonia;

$\mathbf{H_1}$.Economic growth doesnot affect bank profitability in Republic of North Macedonia.

5.Empirical Results

Times series data is used in this study from 1998-2016, all data are obtained from NBRNM, World Bank and FRED Economic data | ST. Louis FED. Identified data are processed by the statistical program Eviews 9.0. **Table 1** below also shows the descriptive statistics of all data used in the study.

Table 1.Descriptive statistics of variables impacting ROA

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	ROA	NPL	LIQUID LIABILITIES TO GDP	GDP GROWTH
Mean	1.035263	17.66263	38.45799	3.031569
Median	0.980000	10.93000	41.84910	3.378736
Maximum	2.260000	41.30000	54.42080	6.473487
Minimum	-1.020000	6.280000	13.37290	-3.067246
Std. Dev.	0.734282	12.43570	14.47170	2.326454
Observations	19	19	19	19

Source: Researcher's own construct using Eviews 9.0.

This study is used to find the impact of independent variable on bank profitability, by using following variables NPL, Liquid liabilities to GDP and GDP growth, with 19 observations. So, the descriptive analysis shows that NPL has an average of 17% and Std. Dev. 12.43570, the maximum and minimum values are 41.30000 and 6.280000, respectively. Liquid liabilities to GDP has an average of 38% and Std. Dev. 14.47170, the maximum and minimum values are 54.42080 and 13.37290respectively, GDP growth has an average of 3% and Std. Dev. 2.326454, the maximum and minimum values are 6.473487 and -3.067246, respectively.

Relevant tests identified are: the test of autocorrelation and multico-linearity test. Multico-linearity test serves to evaluate the linear relationship between the variables, if the index value is greater than 10, it is estimated that variable has a high co-linearity, suggesting his departure from the model. The results are shown in **table 2**, which suggests that multico-linearity does not exist.

Table 2. Correlation of variables impacting ROA

	ΔROA	Δ NPL	Δ LL	GDP growth
ΔROA	1.000000	-0.610874	-0.375925	0.280948
Δ NPL	-0.610874	1.000000	-0.265152	-0.028050
Δ LL	-0.375925	-0.265152	1.000000	-0.130076
GDP growth	0.280948	-0.028050	-0.130076	1.000000

Source: Researcher's own construct using Eviews 9.0.

Autocorrelation is tested by Durbin-Watson test and DW = 2.44. Autocorrelation in the regression analysis is related to the presence of the correlation between accidental errors, the assumption is that the value of the accidental error for one observation is not correlated to the value of the accidental error for any other observation.The result suggest that positive autocorrelation is not significant and to continue with data analysis.

5.1 Linear regression model results

This section will show the relevant results of the linear regression model (OLS) and the data were tested using the Eviews 9.0 statistical program.On the basis of the results from the testing it is possible to make transformations of series and their modelling, with Unit Root test. (HyndmanJ.R.) The series of ROA, non-performing loans and liquid liabilities to GDP are non-stationary series for our model, so the final econometric model for bank profitability and non-performing loans is presented in this form:

$$\Delta \boldsymbol{ROA} = 0.034253\boldsymbol{C} - 0.104883\Delta \boldsymbol{NPL} - 0.164824\Delta \boldsymbol{LL} + 0.056327\boldsymbol{GDPgrowth} \quad \textbf{(2)}$$

The NPL coefficient estimate is negative and statistically significant, indicating the higher the level of non-performing loans, the lower the ROA. The possible explanation for this

relationship is that the client's delay in interest and principal payments affectsthe balance sheet as well as the income statement. Therefore, the results support Hypothesis 1. The non-performing loans has a negative effect on bank profitability (ROA) in Republic of Macedonia.

The estimated coefficient of *Liquid liabilities* ratio is negative and statistically significant, the coefficient of *GDP* is positive and statistically insignificant. Apossible explanation for this is that an increase in economic activities is associated with a low rate of defaults.

The following will appear statistical tables of results in total deposits. It is noted that the variables involved in the study may explain about 71% of ROA in years 1998-2016. Durbin-Watson stat. is 2.44, F-statistic is 11,94450, Prob(F-statistic) is0.000377, estimating that the model is statistically significant.

Table 3. Model Summary

Method: Least Squares Independent Variables	Coefficient	Prob.	R^2	Adjusted R-squared
C	0.034253	0.8635	.719	.658
Δ NPL	-0.104883	0.0002		
Δ LL	-0.164824	0.0023		
GDP growth	0.056327	0.2098		

Source: Researcher's own construct using Eviews 9.0, with bank data and macroeconomic data from 1998-2016 and with dependent variable ΔROA.

Meanwhile, in the following tableare presented summary in which the hypotheses raised in the case is confirmed.

Table 4: Summary of the hypothesis of studying the depended variables ROA

Hypothesis	**Impact**
Non-performing loans has an impact on the ROA	Negative
Liquid liabilities to GDP has an impact on the ROA	Negative
GDP growth has an impact on the ROA	Positive

Source: Researcher's own construct using Eviews 9.0

* Hypothesis is accepted if the value of ***p*** is less than 0.05%, for each variable.

The results of the paper have identified significant results for ROA in the banking sector in Republic of North Macedonia from the 1998 – 2016.

5.2. Econometric Tests

Normality test

The normality test was based on the null hypothesis of normality distribution of the residuals. The results in **figure 1** indicate that we do not reject the null hypothesis of normality distribution at 5% level of significance. Thus the residuals are normally distributed.

Figure 1. Normality test

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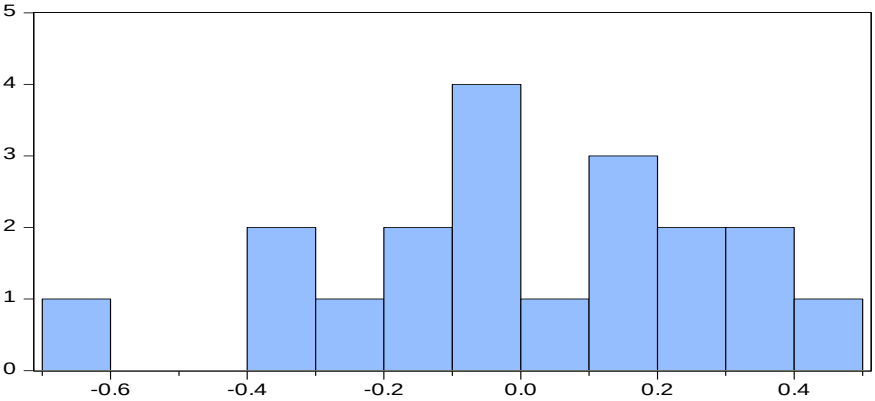

Source: Researcher's own construct using Eviews 9.0

Heteroscedasticity

Based, on the zero hypothesis of non heteroscedasticity. The results in **Table 5** show that we do not reject the zero hypothesis which implies that the remains are homoskedastic

Table 5. Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.288175	Prob. F(3,15)	0.3146
Obs*R-squared	3.892278	Prob. Chi-Square(3)	0.2733
Scaled explained SS	1.957683	Prob. Chi-Square(3)	0.5812

Source: Researcher's own construct using Eviews 9.0.

6. Conclusion

The profit rate of each financial institution is influenced by several factors. Some of them depend only on her and others are part of a wider environment in which she does not always have influence. The results we received from the analysis largely coincide with the constant literature we have read.

In this paper we used the OLS method to examine the impact of non-performing loans on the profitability of the banking system of the Republic of North Macedonia. The survey showed that the increase in non-performing loans is associated with a decrease in ROA (return on assets). These results support the theory, which argues that increased credit risk exposure, measured by non-performing loans, usually is associated with an increase in operating costs and leads to reduced profitability. The results of this study leave several implications for researchers, practitioners and regulators.

On the other hand, regulators should carefully monitor the efficiency of the bank's performance and capital adequacy by paying greater attention to the movements in the relationship between costs and income and the bank's capital position. In particular, regulators should develop regulations and monitoring tools that will trigger early warning signals about possible failures of the bank due to the accumulation of non-performing loans.

Linear regression results show that the differentiation-stationary with Unit Root testof non-performing loans has a negative impact on the differentiationof the banking system's profitability (ROA) and are statistically significant, the independent variable explains about 71% of the model in the period 1998-2016, which would say that the model provides 71% base for the forecast.

7. References

- According to this web: The Motley Fool, What Are Non-Performing Loans? , Article info-Jan 26, 2018 at 8:03PM;
- Biabani, S., Gilaninia, S., and Mohabatkhah,H. (2012). Assessment of Effective Factorson NonPerforming Loans (NPLs) Creation:Empirical Evidence from Iran (2006-2011).Journal of Basicand Applied ScientificResearch, ISSN 2090-4304, 2(10)10589-10597, 2012;
- DermirgucKunt, A., and Huizinga, H.,(2000). Financial structure and bankprofitability. WorldBank working paper no.2430;
- Economic time series page, (2018), *" ROA",* Avaliabla from:http://www.economagic.com/
- Fofack, H. (2005). Non-Performing Loans inSub-Saharan Africa: Causal Analysis andMacroeconomic Implications, World BankPolicy Research Working Paper No. WP3769;
- Hyndman J. R., Monash University, Forecasting: Principles and Practice,Transformations, stationarity, differencing, OTexts.com/fpp/2/4/ Avaliable at: https://robjhyndman.com/uwafiles/6-Stationarity-Transformations-Differencing.pdf;
- International Monetary found, (2018), *"Index"* Avaliable from: https://www.imf.org/external/index.htm;
- Karim, M. Z. A., Chan, C. S., and Hassan, S.(2010). Bank Efficiency and Non-PerformingLoans: Evidence from Malaysia andSingapore. Prague Economic Papers, 2,2010;
- National Bank of the Republic of North Macedonia (2018), Report on the risks in the banking system of the Republic of Macedonia in 2017, Skopje, 67-82;
- Ombaba, M. K. (2013). Assessing theFactors Contributing to Non-PerformanceLoans inKenyan Banks. European Journal ofBusiness and Management, 5(32), 155-162;
- Dr. Samir and Kamra D., (2013),University of Delhi - Swami Shraddhanand CollegeA Comparative Analysis of Non-Performing Assets (NPAs) of Selected Commercial Banks in India, *Opinion: International Journal of Management, Vol. 3, No. 1, June 2013*, SSRN, 2015;

The World Bank, IBRD-IDA, (2018), *"Non-performing loans",* Avaliable from: