The Impact of the Macroeconomic Factors over the Performance of the Banking Sector in Republic of North Macedonia

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ABSTRACT

Monitoring and assessment of the performance of banks and the banking sector as a whole, presents a serious challenge, especially in the environment in which they operate today. The needs and demands of the clients are constantly increasing and changing, as well as the regulatory requirements, which influence the banking operation process, their efficiency, and effectiveness. This paper examines the importance and effects of the macroeconomic factors over the performance of the banking sector in the Republic of North Macedonia, considering the trend in the banking industry. Thus, the logic behind this research is to determine whether and in which direction are aimed effects of some selected macroeconomic variables. The relation between the profitability of the banking sector and some macroeconomic variables has been analyzed by employing ordinary least squares method, to perceive the results of the sector and to identify trends in the key indicators and the factors affecting the performance. The study is based on secondary quarterly data on the performance of the banking sector and some selected macroeconomic variables published by the NBRNM, as well as data from the banks' financial statements for the period between 2010-2019. The general conclusion from this analysis is that the unemployment rate and average net salary growth both significantly affect the profitability of the banking sector in the Republic of North Macedonia, but GDP growth and the National Bank policy rate both are statistically insignificant in the model.

Keywords: ROAA, Banking Sector, Macroeconomic Factors, Ordinary Least Squares Method

INTRODUCTION

The past two centuries has marked the development of the market economy, which is directly correlated to the development of the financial sector, comprising the banking system. In other words, the development of the banking system has contributed to the development and strengthening of economic movements. Therefore, the banking system and its operations are essential in theoretical and practical aspect.

The main function of the banks is the intermediation function performed through the purchase of surplus funds from economic units (business sector, government and individual / household) and distributing them to deficit economic units (Hempel, 1994). The second role is providing the economy with liquidity. The globalization had its impact over the increase of the risk the banks encounter. Therefore, as banks insolvency and non-liquidity can have an impact

over the debtors, shareholders, deponents and other institutions borrowing from the bank, banks can have bigger impact on the economy, compared to any other company.

However, there are some serious indicators which warn that the main characteristics of the banking system are in correlation to the periodic instability of the market. The global financial crises caused bankruptcy of some of the biggest financial institutions, underlined the risks encountered by the global financial system, and imposed concern for a radical reform of the banking sector.

In terms of overall overview of the conditions and the perspectives of the banks in the modern business environment, it is necessary to consider the development of the banking operations, the understanding of the banking principles and the banking operation principles. The most important questions regarding this matter is why the banks following the changes in the world economy have new tendencies, as well as the changes in the new scientific paradigm, and how they have changed the business philosophy. In that regard, the answer is that in order to enable its stability and profitability, significant reforms were conducted in the banking sector.

During the past couple of years, we have witnessed an intensified presence of foreign capital inflows in the total capital, increased concentration, increased competition, increased participation of alternative distribution channels, and decrease of operational expenses which caused need for additional productivity and efficiency in the operations.

The development of the new technologies and the achievements in the field of information technology had significant impact over all aspects of banks operations. Financial innovation and the competition in the banking sector lead to decrease of the interest margin in the banking sector and thereof the profitability. On the other hand, in order to comply with the international banking regulation and the corporate management, the banking legislation experienced significant changes. This especially refers to compliance with the BASEL regulation which increased the liquidity as well as it increased the capital requirements implied to the banks. As a result of these changes, in the past couple of years we have witnessed the transformation and modernization of the banking sector, where the foreign banking groups had the biggest impact through overtaking and merging in the banking sector.

The performance of the banks and the banking sector have always been and will be subject of analyses, as it reflects the conditions and the trend of movement in the banking sector, as well as the correlation of certain factors which have the biggest impact over the overall performance of the banks.

The analyses of the performance and the financial indicators of the banks and the sector in general, enables making of rational decisions in corporate management and maintenance of stability in the banks as well as the financial system in overall. The evaluation of the performance of a certain bank, and the sector as a whole, is important for the economy and especially for the subjects which are directly involved in the banking system as deponents, shareholders, potential investors and regulatory bodies.

The evaluation of the profitability of the banking institutions is based on the financial analyses, i.e. analyses of the financial statements and financial indicators of profitability and risk. However, while evaluating the banks performance, the supervisory entities take under consideration not only the qualitative aspects of the bank's operations, but the quantitative indicators too.

Taking under consideration the importance and effects that the financial and banking sector have on the overall economic wellbeing, it is of essential importance to analyze the performance and the determinants of the performance of the banking sector. Hence there is a particular interest in analyzing the two main determinant groups that are extremely important for the performance of the banking sector - the macroeconomic environment (which defines the key environment for efficient functioning) and the organizational factors.

In our paper we attempt to determine the key determinants of the performance of the Macedonian banking sector.

1. LITERATURE REVIEW

The macroeconomic environment in which banks operate is a set of factors that influence the direction of banks' business activities as well as their performance. Research conducted by Gonzales - Hermosillo, Pazarbasioglu, and Billings (1997) shows that macroeconomic factors have a significant impact on financial performance. Among the most important macroeconomic factors that have an impact on the financial performance of the banking sector are the following: gross domestic product, exchange rate, inflation rate and the amount of the referent interest rate of the National Bank. In order to obtain a complete picture of the economic environment, in addition to the aforementioned macroeconomic factors, other macroeconomic determinants are often analyzed, such as: budget deficit, public debt, current balance, as well as the country's international investment position.

A study of Athanasoglou et al. (2006) conducted on Greek Banking industry over the period 1985-2001 reveals that the macroeconomic factors are not significantly affecting the profitability of the banks while all bank specific factors are strongly affecting profitability.

In the study of Pasiouras and Kosmidou (2007), conducted to 584 European banks between 1995 to 2001, reveals that the effect of the inflation is minor or has small influence on profitability of the domestic banks and negative influence on the banks with majority foreign ownership.

External factors of the profitability of the bans are not under control of management body of the banks (Vong & Chan, 2009). In the part of the external factors, in most of the papers there is an evidence over the impact of Gross Domestic Product on the profitability of the banks.

The growth of the GDP is linearly connected to the credit demand which shows that GDP increase leads to higher credit demand and vice versa (Ongore & Kusa, 2013). In a study by Bilal et al., (2013), conducted on Pakistan Banks have discovered that GDP has linear positive effect over ROE.

In a study performed by Toprak and Talu (2015) attempted to reveal the bank-specific and macroeconomic factors of Turkish commercial banks between 2005-2015. They conclude that among macroeconomic factors, real GDP and interest rates have positive relation with profitability while the TL exchange rate has a negative impact.

Ghurtskaia (2018) in her paper performed regression analysis between the dependent variable ROA and independent variables which include ROA, unemployment, inflation, FDI and exchange rate in Georgia. The study suggests that macroeconomic factors have minor significance with the profitability of the banks.

2. EMPIRICAL ANALYSIS OF THE IMPACT OF MACROECONOMIC FACTORS ON THE PERFORMANCE OF THE BANKING SECTOR

2.1.Methodology, Data and Variables

In this paper a descriptive statistical and econometric analyses were performed. As descriptive statistics for calculated patterns by frequency are used the following indicators: mean, minimum value, maximum value and standard deviation. A brief description of these statistical indicators is also provided. Furthermore, in order to determine the linear dependence between the independent variables and the dependent variables, a correlation coefficient is calculated. Additionally, we use a regression analysis, i.e. a multiple regression using the least squares method (LSM). This regression analysis aims to investigate the causal relationship between different variables.

In order to analyze the profitability of banks, a multiple regression equation was estimated in this study. Using the multiple regression analysis model with the ordinary least squares

(OLS) method, it is provided the opportunity to analyze the profitability of the banking sector determined by a series of separate independent variables. The multiple regression equation will be of the form:

$$Y_t = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \cdots + \beta_n X_{nt} + \varepsilon_t,$$

where Y_t is a dependent variable, while X_1, X_2, X_{nt} are independent variables, β_0, β_1, β_2, β_n are the estimated coefficients, and ε_t is the error term containing the other variables affecting the dependent variable, and they are not included in the model, i.e. are not contained in the independent variables.

Accordingly, the OLS method (ordinary least squares) will be applied as previously mentioned. The least squares method is the base of modern statistical analysis. In addition to its limitations and random errors, its numerous variations, expansions and appropriate expressions bear the burden of statistical analysis and are known and appreciated by all. This method is called the "least squares" method because this method minimizes the sum of the squared differences between the predicted and the actual value of the variables. That is, it is equivalent of minimizing the sum of squares of regression residuals. The estimates obtained by this method are considered to be efficient, since there are no other estimates that have less dispersion over the actual value of the parameter.

These grades are often referred to as the best unbiased grades. However, if the assumptions of the OLS method are not fully met, or some of those assumptions are disturbed, then the estimates obtained by the OLS method have a certain degree of bias and are not considered effective judgments. So, despite the widespread application of this method in empirical research due to its simplicity, it also carries certain risks of bias in the estimates obtained with it. This method assumes that the independent variables are exogenous, i.e. they are exogenously assigned to the model, and that is, they influence the dependent variable without the dependent variable affecting them. This would mean that the increase in the loan interest rate would affect the increase in the bank's profitability, but also that the increase in the bank's profitability would not affect the increase of the loan interest rate.

Table-1: Description of the Model Variables

Name of the variable	Variable Short Names
Return on Average Assets	ROAA
Real GDP Growth Rate (Annual Growth Rates in %)	GDP Growth
Inflation Rate (Annual Changes in %)	Inflation
Unemployment Rate (in %)	Unemployment Rate
Average Net Salary Growth (Real Changes)	Average Net Salary Growth
National Bank Policy Rate	Policy Rate

The success of econometric analysis ultimately depends on the availability of appropriate data. Therefore, it is considered desirable to give a small overview on the sources, types and limitations of the data, which we find in this analysis. Although data can be obtained from different institutions, the quality of data is not identical everywhere, primarily due to the different methodologies used in data collection. The data used in this empirical analysis are taken from publicly available databases from the NBRM, the Ministry of Finance and the State Statistical Office. The data used for certain variables are quarterly data and cover the period from the first quarter of 2010 to the fourth quarter of 2019. In addition, all data belong to the quantitative data set. Hence, the nature of this analysis allows us to abstract from the use of qualitative data. The table below provides an overview of the individual variables used in the following part of the analysis.

2.2.Analysis of the Integrative Characteristics of the Series

The main goal of this empirical analysis is to determine the causality between the dependent variable on one hand and the independent variable on the other. Given that this empirical analysis is based on time series data, the underlying segment which is examined is the problem of stationarity. The concept of stationarity exists if the mean and variance of the time series are constant over time, and the value of the covariance between two time periods depends only on the distance or lag between the two time periods and not on the actual time for which the covariance is calculated (Gujarati, 1995). The importance of the concept of stationarity is reflected in the regression of one time series variable over another time series variable. Such a regression can result in a very high R^2 even though the relationship between the two variables is not meaningful i.e. we face the problem of "false" regression. This problem is due to the fact that if the two variables, i.e. time series are non-stationary, meaning they show pronounced trends in movement, the high R^2 is due to the presence of the trend, and not to the true relationship between the two variables. It is therefore very important to find out whether the relationship between the two economic variables is true or false, as non-stationary time series can lead to false regression relationship. Hence, it can be concluded that the concept of stationarity is of great importance for the relevance of econometric analysis in this paper. In order to determine the time series integrative characteristic, this paper will apply the ADF test (Augmented Dickey Fuller). The set hypotheses are:

- H_0: The time series variable has a unit root; the time series variable is non stationary;
- H_1: The time series variable is stationary.

The results of the conducted ADF-test for the integrative characteristics of the used variables in our model, we can conclude that according to the stated test, all variables except inflation rate are stationary at level I (0). The table 2 shows the results of the integrative characteristics of the used variables.

Table-2: Results of the Integrative Time Series Feature (ADF Test)

Variables	Statistics (LLC-test)	p-value od the statistics (LLC-test)
ROAA	-3,371002	0,0702
GDP Growth	-6,531966	0,0000
Inflation Rate	-2,129762	0,5138
Unemployment Rate	-2,619652	0,0102
Average Net Salary Growth	-3,243261	0,0911
Policy Rate	-7,831813	0,0000

Source: Author's Calculations

2.3. Correlation Analysis

In order to determine the degrees of linear dependencies between variables, we can calculate the simple correlation ratios. They are shown in the table 3.

Econometric theory has confirmed that an absolute value of R higher than 0.80 is already a sign of strong multicollinearity. The results shown in the table 3 show that most of the variables' values are not highly correlated. According to the t-statistics of the ratios and their p-values several conclusions can be stated. For instance, there is a high negative correlation between the variables ROAA and unemployment rate, and moderate negative correlation between the variables ROAA and National Bank policy rate. Among the variables ROAA and unemployment rate there is a strong and significant negative relationship with a ratio of 0.807693. This indicates that there is a strong inverse proportional relationship between banks' profitability and unemployment. We can say that the unemployment shown through reduced disposable income and reduced savings among economic entities causes a decrease in the banks'

loan base through reduced deposits; and because most of the banks' profits are derived from their lending activity, their profitability declines. On the other hand, the reduced profitability of banks and the reduced loan offer to the citizens and the business sector cause a decrease in the economic activity and increase of the unemployment.

Table-3: Correlation Ratios

Correlation t-Statistic Probability	ROAA	GDP Growth	Unemployment Rate	Average Net Salary Growth	Policy Rate
ROAA	1,000000 --- ---				
GDP Growth	0,023945 0,147649 0,8834	1,000000 --- ---			
Unemployment Rate	- 0,807693 - 8,444579 0,0000	-0,120091 -0,745689 0,4604	1,000000 --- ---		
Average Net Salary Growth	0,731426 6,611928 0,0000	0,332088 2,170297 0,0363	-0,690926 -5,891553 0,0000	1,000000 --- ---	
Policy Rate	- 0,495974 - 3,520969 0,0011	0,019495 0,120196 0,9050	0,721025 6,414547 0,0000	-0,273928 -1,755765 0,0872	1,000000 --- ---

Source: Author's Calculations

Additionally, moderate negative and significant relationships exist between the variables ROAA and National Bank policy rate with a ratio of 0.495974. The increased profitability of the banks increases their lending activity and is reviving the economy. This will result with increased supply of money, which will cause easier access to money or lower interest rates. Low interest rates, on the one hand, cause higher demand for loans and, revive the economy through greater investment, which also implies increased profitability of banks due to higher volume of activities.

Also, high and significant positive correlation of 0.721025 exists between unemployment rate and policy rate. This means that as interest rates rise, borrowings become expensive, effective demand decreases, investments decline, and the economy begins to contract. As a result, unemployment rate is increasing. Conversely, when unemployment declines, the disposable income of the citizens' increases, they spend more and save more, which means that the loan potential offers of the banks is increased and interest rates are lower. Consequently, there is strong and significant positive correlation between ROAA and average net salary growth. High negative but significant relation exists between unemployment rate and average net salary growth. The other correlations between variables are insignificant, i.e. the p-value is higher than the significance level of 0,05.

2.4.Regression analysis

Based on the individual variables used in this analysis, a multiple equation is specified representing the profitability of the banks in the Republic of Macedonia between the first quarter of 2010 and fourth quarter of 2019. However, due to its wide acceptance and involvement in many empirical researches, in order to come to an indicative estimation, in this research the used method will be the ordinary least squares (OLS) method. The regression equation will be of the form:

$$ROAA_{2010q1-2019q4}$$
$$= \beta_0 + \beta_1 GDP_{growth_{2010q1-2019q4}} + \beta_2 Unemployment_{rate_{2010q1-2019q4}}$$
$$+ \beta_3 Average\ Net\ Salary_{growth_{2010q1-2019q4}} + \beta_4 Policy_{rate_{2010q1-2019q4}} + \varepsilon_t$$

The results of the regression equation are shown in table 4:

Table-4: Results of the regression equation

Dependent Variable: ROAA				
Independent Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
GDP Growth	-0,055071*	0,028486	-1,933225	0,0613
Unemployment Rate	-0,085130***	0,027774	-3,065076	0,0042
Average Net Salary Growth	0,117943***	0,041141	2,866804	0,0070
Policy Rate	0,025282	0,114247	0,221293	0,8262
C	3,128046***	0,525795	5,949169	0,0000
Parameters of Importance of the Model				
Determination Ratio (R^2)				0,738210
Adjusted Determination Ratio (Adjusted R^2)				0,708291
F-statistics				24,67370
The significance of F-statistic				0,000000

*** / ** / * denotes significance at 1%, 5% and 10% level of significance, respectively; Source: Author's Calculations

Based on the results we can point out the following conclusions:
- The parameters β_1, β_2, β_3, and β_4 show that banks' profitability expressed by the ROAA indicator:
  - will decrease by 0,055071% if GDP increase by 1%;
  - it would decrease by 0,085130% if unemployment increase by 1%;
  - will increase by 0,117943% if average net salaries increase by 1%;
  - will increase by 0,025282% if National Bank policy rate increases by 1%.
  - but if we take into account the p-values we can say that from the statistical point of view, the ROAA indicator of banks' profitability is affected by unemployment and average net salaries.
  - while the econometric analysis revealed that the impact of National Bank policy rate and GDP growth on banks' profitability are not statistically significant.
- The coefficient of determination R^2 has a value of 73,82%, which indicates that many of the variations in the model are explained by the included variables.
- The p-value of the F-statistics of the evaluated model is lower than 5% (0%) and we accept the hypothesis that the explanatory variables have a significant impact on the movement of the dependent variable.
- Multicollinearity has been tested through the variance-inflation factor (VIF). The VIF score of that model is 1,15; and it is generally accepted that if VIF is greater than 5 then multicollinearity should be treated as a problem. Also, many experts consider that if the absolute value of the simple correlation coefficients (r) are higher than 0.80, it is already

a sign of strong multicollinearity. In our case, we can say that multicollinearity by both criteria should not be treated as a problem.

A Breusch-Pagan-Godfrey test has also been performed to test whether the variance of the errors from a regression is dependent on the values of the independent variables. The p-value of the test statistics is 40,01%, i.e. it has a higher value of 5%; in this case we cannot reject the null hypothesis of homoskedasticity.

CONCLUSION

Profitability is a fundamental goal of every financial institution and a prerequisite for its long-term survival. For this reason, in theory as well as in practice, particular attention is devoted to the development of performance indicators and implementing measurement systems. They are supposed to enable the monitoring of performance compared to targets in an appropriate and timely manner, and to establish appropriate reporting systems. Factors affecting the performance of the banking sector can be systematized into two groups: macroeconomic and intra-organizational. The most common macroeconomic factors that are used in similar research papers are: the GDP, inflation and exchange rate. On the other hand, the intra-organizational factors that influence the performance of banks, which have been analyzed in various studies, consists of: size of banks, capitalization, market share, efficiency, ownership structure. Regarding the empirical analysis of the determinants of the performance of the banking sector in the Republic of North Macedonia, it can be pointed out that the correlation analysis of the macroeconomic factors indicates that very high negative correlation exists between the variables ROAA and unemployment, and moderate negative correlation between ROAA and National Bank policy rate.

This indicates that there is a strong inverse proportional relationship between banks' profitability and unemployment. We can say that the unemployment shown through reduced disposable income and reduced savings among economic entities causes a decrease in the banks' loan base through reduced deposits; and because most of the banks' profits are derived from their lending activity, their profitability declines. On the other hand, the reduced profitability of banks and the reduced loan offer to the citizens and the business sector cause a decrease in the economic activity and increase of the unemployment. The increased profitability of the banks increases their lending activity and is reviving the economy. This will result with increased supply of money, which will cause easier access to money or lower interest rates. Low interest rates, on the one hand, cause higher demand for loans and, revive the economy through greater investment, which also implies increased profitability of banks due to higher volume of activities.

The regression analysis indicates that 73,82% of the variations in the banks' profitability expressed by the ROAA indicator are covered by the variations of the variables included in the model (GDP growth rate, unemployment rate, average net salaries growth rate and policy rate). The remaining 14% of the variances are not explained by the model, i.e. they are explained by some variables that are not included in the model.

According to the empirical evidence in this paper, there are several variables that can have a significant impact on the banks profitability. Hence, a cautious approach through better understanding and managing of this variables can be implemented in order to protect and increase profitability. However, as this methods has its own limitations, an additional research can be made in order to specify the measures that can contribute to improving the banking system's performance.

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