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DETERMINANTS OF BANK PROFITABILITY IN THE REPUBLIC OF MACEDONIA – A PANEL DATA ANALYSIS

The goal of this paper is to examine the determinants of profitability of the 16 banks in the Republic of Macedonia using quarterly data from Q1 2007 to Q4 2013. As a measure of profitability of the banks we will use the ratio of return on assets and the ratio of return on equity. Empirical results provide evidence that among internal factors of bank profitability, the most important ones are credit risk management capital to total assets ratio and operating expense management. From the external determinants, we found only the inflation to be significant for bank profitability.
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1. Introduction

Information on the performance of each bank is an important issue that has aroused interest of the public as a user of banking services, the public as a potential investor in shareholders capital of the banks, the banks management, the financial markets, the banking supervisors and regulators in terms of controlling the stability of the financial system and in academic circles.

This interest has intensified significantly in the last two decades. Namely deregulation, technological change and the globalization of goods and financial markets, the financial crisis of 2008-2009 and European debt crisis of 2011-2012 have affected all aspects of the operation of banks, and accordingly have impacted on profitability. Also, international financial crisis, the severe reduction of both supply and demand of bank loans, the major deterioration of bank portfolio quality, the enhancing of banking risks etc., have affected banks profitability in most of the countries. Furthermore, the emergence of a strong competition from non-bank financial institutions such as investment and pension funds, the implementation of Basel 3, will certainly have an impact on the profitability and performance of the banks. In this context, Republic of Macedonia may provide an interesting case study for countries in transition. In the past two decades, the Macedonian

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economy has experienced a number of significant economic events such as: a decline in GDP of about 30% from the 1989 to 1994; price volatility; very high inflation during the early years of independence; economic blockade by Greece over the dispute related to the name of the country; the wars in the former Yugoslavia; very high unemployment rate exceeding 30 per cent; internal ethnic conflict in 2001 which brought the country at the brink of civil war; the global financial and economic crisis; Eurozone debt crisis etc. Despite all these shocks, the Macedonian banking sector has remained a factor for maintenance of macroeconomic and financial stability.

Like many other countries in transition, in the past two decades the banking sector in the Republic of Macedonia has been constantly changing. The changes include changes in banking regulation, consolidation, entry of foreign banks, and changes in banking activities and performances. The Macedonian banking model is relatively conservative and is characterized by high capital adequacy ratios, strong liquidity and low reliance on foreign financing. In 2007, the last year before the recent global financial crisis, Macedonia had one of the highest capital adequacy ratios (17,0%) among Central and Eastern European countries. In the same year, bank credit penetration was 34, 22% of GDP, one of the lowest ratios within this group of countries (although it increased more than 2 times from 16,45% in 2002). The credit expansion is largely funded by deposits, with loans to deposit ratio of about 88% in 2014, which indicates that there is an excess of liquidity and insufficient utilization of bank deposits. This is a separate topic that requires broader elaboration, but in this context it should be mentioned that increace of the loan/deposit ratio can be realized, by increasing a capacity of companies to finance their activities through bank loans. One of the most significant factors that affects the capacity of companies for bank financing , according to the general banking criteria is their capital position. Many of them have relatively low level of capital invested initially from their owners, most of it generated through reinvestment of profits earned over the years of their existence. Furthermore, from the viewpoint of the banks there are several other limiting factors which constrain credit activity of the banks:relatively high level of indebtetness of companies (debt/equity ratios), unsatisfactory quality of financial management and corporate governence in significant percentage of enterptises,etc. However, the fact that Macedonian banking sector is structurally underdeveloped and not highly levered has made it relatively well positioned during and after the crisis. Despite the fact that maintenance of stability has traditionally been the main priority of the Macedonian banking sector, the profitibility indicators have improved in recent years, although they are still below regional average. Bearing all this in mind the purpose of this paper is to analyze the key determinants of profitability of banks in the Republic of Macedonia over the time period from 2007 to 2013. Although there are many studies that analyze the profitability of the banking sector in many countries, only a few authors in their research include the banking sector of the Republic of Macedonia. According to author's knowledge, there are only five studies that examine the determinants of profitability of the Macedonian banking sector as a single country Davcev and Hourvouliades (2009), Ćurak et al. (2011),Poposka and Trpkoski (2013) Boshkoska (2013) and Iloska (2014). Also the profitability of Macedonian banks was analyzed in the two panel countries studies from Athanasoglou et al. (2006) and Košak and Čok (2008). Unlike the aforementioned studies from Davcev and Hourvouliades (2009), Ćurak et al. (2011), Poposka and Trpkoski (2013) and Iloska (2014), in this paper

we used a longer time series of data, and also we included the industry-related and macroeconomic determinants.

Through research on this issue, in this paper we expected to get results of what are the key variables that determine the profitability of banks in the country, further movements and directions of bank profitability of Macedonian banking sector in order to achieve improved performance. The knowledge of the factors that influence bank profitability is not essential just for the bank managers, but also for other stakeholders like the central bank, government and other authorities. The analysis of these factors can help for the development of effective strategies in order to successfully face the new challenges for the banking sector in the country, such as the emergence of new financial institutions and instruments, the requitments of the Basel 3 regulations and also achievement of satisfactory profit for banks' shareholders.

The structure of the paper is as follows. After the Introduction, in Section 2 will be explained in theoretical settings profitability of banks, and will also be given an overview of the empirical literature that deals with this issue. Sources of the data employed as well as methodology are presented in Section 3. Section 4 presents the empirical results and section 5 concludes the paper and gives policy recommendations.

2. Literature Review

In this section first we present the theoretical research and highlight the most relevant theories in the field of profitability of banks. The theoretical frameworks are usually followed by the empirical investigation of the developed models, so in the first part of literature review we will highlight both the models and the empirical findings, where they are present. Then we proceed to the empirical studies which for the most part evaluate the determinants of profitability of the banks in each particular country and across countries.

2.1. Theories about the determinants of banks' profitability

One of the most debated and most tested theories in the literature that deals with the studies of profitability is the so-called Structure-Conduct-Performance (SCP). The basis of this model has been found in the work of Bain (1950,1951), and was applied in the manufacturing sectors. This model was later introduced in the banking sector through the work of Schweiger and McGee (1961) which was further used as a basis for empirical research on the impact of concentration on banking sector profitability. The basis of this theory suggests that banks are able to extract monopolistic rents in concentrated markets by their ability to offer lower deposit rates and charge higher loan rates. There are two alternative hypotheses to this model: the concentration-stability hypothesis and the concentrationfragility hypothesis.

The concentration-stability hypothesis proposes a negative relationship between market concentration and risk. According to this hypothesis, banks in concentrated markets can increase profits and reduce financial instability through the provision of greater capital

reserves, which protect them against economic and liquidity shocks Boyd, et al. (2004). On the other hand, in markets with high concentration, banks have a higher franchise value, which deters them from taking excessive risks Keeley (1990). Besides, large banks have a comparative advantage in monitoring loans and are able to achieve greater diversification of both the loan portfolio and the geographical distribution Méon and Weill (2005). Lastly, it is much easier to supervise a few banks than several. Consequently, supervision is more effective in concentrated systems with fewer banks, and such greater effectiveness reduces systemic risk Allen and Gale (2000).

However, the opposite approach, namely the concentration-fragility hypothesis, asserts that the higher the concentration, the higher the risk. A higher concentration can lead to an increase in interest rates on loans, so borrowers will have to undertake riskier projects to repay their loans Boyd and De Nicolò (2005). More over, banks in more concentrated markets tend to be larger, so they are usually more protected by governments, given their importance in the overall economy. Nevertheless, this additional protection may lead them to take greater risks, which may reduce financial stability Mishkin (1999). Moreover, a larger size and greater diversifycation (more common among big banks) can lead to reduced efficiency in management, less effective internal control and increased organizational complexity, which can lead to higher operational risk Cetorelli et al. (2007).

Many researches do not support this theory, since it is not supported by unified empirical results or conclusions. As a result, another theory appeared, the so-called. Theory of Efficient Structure (E.S). This hypothesis states that efficient firms increase in size and market share because of their ability to generate higher profits, which usually leads to higher market concentration. To distinguish between the two hypotheses, past researchers have included market share as an independent variable, with a positive coefficient usually supporting the EFS hypothesis (Smirlock, 1985). The other proponents of this theory Demsetz (1973), Peltzman (1977), Brozen (1982) conclude that there is no relationship between concentration and profitability, but thrre is connection between the bank's share of market and profitability. But, unlike previous authors, Chirwa (1987, 1998) in his study received negative and statistically insignificant results that refute the theory of efficient structure.

The next theory which examines the profitability of banks is the so-called portfolio theory. According to this theory the optimal level of maintenance of each asset in the portfolio of the bank is determined by a number of factors such as the vector of rates of return on all assets held in the portfolio, vector of the risks associated of each financial asset in the portfolio and the size of the portfolio Agu (1992). This means that diversification and portfolio composition of banks are the result of decisions made by the banks' managements. The ability to get maximum profit depends on the funds that are in the portfolio and obligations established by management and the costs incurred by the bank to produce each component of assets.

In accordance with the portfolio theory, many studies have introduced some useful variables in the profit function of commercial banks. Sinkey (1975) postulated that there are several factors, both financial and operational, that might be used to diagnose possible problems in a bank's performance. The factors are: assets composition, loan characteristics, capital adequacy, sources and uses of revenues, efficiency and profitability. Ford and Oslon

(1978) reported that the financial determinants of high performance banks are: gross loans to total deposit, gross charge-off to loans, interest on deposits, securities income to securities, municipal bonds, payroll expense to employees, over head to earning assets, operating expenses to earning assets, interest on deposits to time and saving deposits, loan income to gross loans, loan loss provision to earning assets. Similar determinants are included in the model of banks performance used by Baker (1978).

There are also theoretical explanations for the equity-to-asset ratio. These explanations are based on the signaling and bankruptcy cost hypothesis. The first hypothesis states that a higher equity ratio is a positive signal to the market of the value of a bank Heid, Porath and Stolz (2004). Less profitable banks cannot achieve such a signal since this will further deteriorate their earnings. In this way a lower leverage, indicates that banks perform better than their competitors who cannot raise their equity without further deteriorating the profitability. The latter hypothesis suggests that in a case where bankruptcy cost are unexpected high a bank hold more equity to avoid period of distress Berger (1995).

Overall, the theoretical review yields variables like concentration, market share, loan characteristics, capital adequacy, payroll expense to employees, over head to earning assets, operating expenses to earning assets, as determinants influencing profitability of banks. It should be noted that, there are not purely theoretical papers which used macroeconomic determinants in their theoretical models and there is no concrete evidence of how these factors affect the profitability of the banks. But as we can see in the next section, the authors who empiricaly investigate the determinants of banks' profitability also used macroeconomic determinants.

2.2. The empirical literature

The studies which tried to identify what are the major determinants of the profitability of the banks can be grouped into two categories: those that have focused on a panel of countries - Molyneux and Thornton (1992), Abreu and Mendes (2002), Staikouras and Wood (2004) , Goddard et al. (2004), Athanasoglou et al. (2006) , Micco et al. (2007), Pasiouras and Kosmidou (2007), and those that have focused on a particular country - Berger et al. (1987), Berger (1995), Mamatzakis Remoundos (2003), Naceur (2001, 2005), Aburime (2008) Athanasoglou et al . (2008).

Empirical results of the above studies differ, based of databases, time periods, and so on, the basis of differences in the countries themselves. However, there are some common elements that allow to categorize determinants of the profitability of the banks. Bank profitability is usually measured by the return on assets ROA or return on equity ROE, which is the return to shareholders on their equity and are expressed as a function of internal and external determinants. The internal determinants include: bank-specific variables size of the bank, credit risk, operational costs, the ratio of capital adequacy. The external determinants reflect environmental determinants (industry-related and macro-economic) that are not related to bank management but reflect the economic and legal environment that affect the operation and performance of banks.

Since the purpose of this paper is not to make a review of the empirical literature, in sequel of the paper we made short sublimate of the empirical literature that emphasizes the determinant of banks profitability in panel of countries in Central and Southeast Europe where Republic of Macedonia belongs. Also we will analyze studies that examine the determinants of profitability of the Macedonian banking sector as a single country.

Athanasoglou et. al (2006) explore determinants that affect the profitability of the banks in the SEE countries (Albania, Bosnia and Herzegovina, Bulgaria, Macedonia, Romania, Serbia, Croatia and Montenegro) using data for the period 1998-2002. They introduced a new determinant - the banking reform index, which identifies the progress in areas such the adoption of regulations according to international standards and practices and the implementation of higher and more efficient supervision. Their results are pointing out that logarithm of total assets and the equity to total assets ratio, have positive effects on the profitability of the banks, while the total loans and operating costs relative to total assets have a negative impact on the profitability. A positive relationship between banking reforms and profitability was also identified.

Košak and Čok (2008) investigate the relationship between bank ownership (foreign vs.domestic) and bank performance in selected set of six South-East European countries: Albania, Bulgaria, Croatia, Macedonia, Romania and Serbia and Montenegro (at the time), using data for the period 1995-2004. In their analysis they were using three types of data. The first type of the explanatory variables refers to the individual bank characteristics, the banking market characteristics and macroeconomic variables. Their results show that, while bank specific factors reflecting capital strength, cost efficiency and credit risk exposure proved to be associated with performance measures according to prior expectations, liquidity management and bank asset structure factors didn't demonstrate any statistically significant link to performance indicators. From the market specific and macroeconomic factors only interest rate spread and HHI and, to some extent, GDP growth rate and the growth rate of the foreign exchange rate, proved to have significant explanatory power, whereas market share and stock market capitalization to GDP ratio turned out to be inconclusive.

From the studies which have focused on a particular country we will make short sublimate of four empirical studies that have focused on a profitability of Macedonian banking sector.

Davcev and Hourvouliades (2009) examine the influence of bank specific factors on profitability of nine banks in the Republic of Macedonia. The autors used ordinary least square method against two dependent variables that serve as profitability proxies: the ROE and the ROA, using data from 2005 to 2007. Their findings show that the most significant variables to bank profitability are the equity to assets ratio and the total loss on loans. The operating expenses are significant only in the ROE profitability. Other variables, like bank size, inflation and loans to assets, fail to prove significant, both in the multiple and in the single regression models.

Ćurak et al. (2011) analyzes bank-specific, industry-specific and macroeconomic determinants of bank profitability. They applied dynamic panel analysis on the sample of 16 banks in the Macedonian banking system in the period between 2005 and 2010. According to the obtained results, among internal factors of bank profitability, the most

important one is operating expense management. Further, the profitability is influenced by solvency risk and liquidity risk. Regarding the external variables, economic growth, banking system reform and concentration show significant effect on bank profitability in the Republic of Macedonia.

Poposka and Trpkoski (2013) examined Macedonian banking sector profitability from Q4/2001 – Q3/2012, using ordinary least square method. The regression results show that adequacy ratio, capital and reserves to total assets ratio, highly liquid assets to total assets ratio, non-performing loans to total loans ratio, net-interest income to gross income ratio and personnel costs to non-interest expenses ratio are significant in determining the profitability of the banks. Though, GDP growth rate, loans to population to gross loans ratio and business loans to gross loans ratio are statistically insignificant in determining the profitability (ROA and ROE) of banks in Macedonia.

Boshkoska (2013) investigated the structure and the profitability of the banking sector in Republic of Macedonia comparing it with the banking sectors of some countries in the region. As a result of her research she made a list of several conclusions: 1) The research showed that the small-sized banks have a major role in decreased profitability of the entire sector. 2) It is necessary to lower the number of banks existing in Macedonia through the processes of merging, overtaking of the smaller banks by the big ones, in order to strengthen the competition in the banking sector. 3) Bank consolidation will have the following benefits for smaller banks:- Increased market share - Expansion of business activities - Increased type and quality of service for their clients- Increased competitiveness- Increased profitability - Rationalized expenses 4) Introduction of the new Basel standards will influence the level of profitability of banks in Macedonia

Iloska (2014) using the simple ordinary least squares (OLS) method estimates profitability of the Macedonian banking sector over the period 2008-2011. As a measure of profitability she used the return on assets (ROA). The empirical findings indicate that operating expenses and loan-loss provisions exhibit negative relationship with bank profitability, while the staff expenses, bank size and the share of loans in total assets affect the profitability positively. In addition, the results suggest that liquid assets, deposits and non-interest income have very weak influence on profitability.

3. Methodology

3.1. Model Specification

In this study we adopted panel data analysis for conducting our model. The term panel data refers to pooling of observations of separate units (countries, banks, groups of people etc.) on the same set of determinants over several time periods Baltagi (2001). Prior to describing our model it is important to stipulate the reasons why in our analysis we will used panel data, and why panel data analysis can be beneficial. Among the main advantages of panel data, compared to other types of data, is that the approach allows testing and adjustment of the assumptions that are implicit in crosssectional analysis Maddala (2001).

In our study we use unbalanced panel for sixteen banks in the Republic of Macedonia using quarterly data from 01/2007 to 04/2013.

The general model to be estimated is of the following form:

$$y_{it} = \mu + \sum_{k=1}^{K} \beta_k X_{it}^k + \varepsilon_{it} \tag{1}$$

$$\varepsilon_{it} = \nu_i + u_{it} \tag{2}$$

where y_{it} is the profitability of bank i at time t, with $i = 1,...,N; \ t = 1,..., T$, μ is a constant term, X_{it} are k explanatory variables and ε_{it} is the disturbance with ν_i the unobserved bank-specific effect and u_{it} the idiosyncratic error. This is a one-way error component regression model, where $\nu_{it} \sim \text{IIN}(0, \sigma_\nu^2)$ and independent of $u_{it} \sim \text{IIN}(0, \sigma_\nu^2)$.

According to the discussion in the Introduction section we will use three groups of the explanatory determinants X_{it}: bank-specific, industry-specific and macroeconomic determinants. Then the specification of model (1) with the X_{it} separated into three groups will have the following form:

$$y_{it} = \mu + \sum_{j=1}^{J} \beta_j X_{it}^j + \sum_{l=1}^{L} \beta_l X_{it}^l + \sum_{m=1}^{M} \beta_m X_{it}^m + \varepsilon_{it} \tag{3}$$

where the X_{it} with superscripts j, l and m denote bank-specific, industry-specific and macroeconomic determinants respectively.

Before crossings to identify potential internal and external determinants of profitability it is necessary to identify the dependent determinant. In the literature, bank profitability, typically measured by the return on assets (ROA) and/or the return on equity (ROE). ROA is return on assets and it is calculated as the ratio between net profit and total assets of the bank. This indicator shows the skills of management to make use of financial and material resources in a manner that will provide maximum profit and, according to Golin (2001), this indicator is a key factor that can determine the profitability of the bank. In ideal circumstances, the denominator should be calculated on a daily basis. However, because such data is unavailable for the needs of our paper we will use a quarterly data.

But although ROA provides useful information about bank profitability, that is not what the bank owners care about most. They are more concerned about how much bank is earning on their equity investment that is measured by the return on equity - ROE Mishkin (2012). ROE is the rate of return that shareholders have received on invested capital. This indicator

is calculated as the ratio between net profit and equity of the bank. In order to preserve the real value of capital in terms of inflation, the rate of return should be at least equal to the rate of inflation. According to Dietrich and Wanzenried (2010), this indicator is not the best indicator for determining profitability. Namely, it is known that banks with lower financial leverage (more capital) usually have higher indicator of ROA, but lower ROE indicator than banks with higher leverage. Given that low financial leverage is a characteristic of the entire banking sector in the Republic of Macedonia, banks realize low return on capital, although characterized by a satisfactory rate of return on assets. Because of this fact for the purposes of our paper we consider that ROA is a better and more meaningful indicator for determining profitability, although in our analysis we will also present the results of ROE.

Within our presentation of the independent determinants, we consider both bank-specific profitability determinants, as well as the macroeconomic and industry-specific characteristics. Factors that we use as control determinants, and can explain the profitability of banks, include the following:

- Bank-specific profitability determinants: Liquidity ratio, bank size, capital to total assets ratio, credit risk, salary expenses to total assets ratio;

- Industry-related determinants: Concentration in the banking sector and EBRD index;

- Macroeconomic determinants: GDP growth and inflation.

3.1.1. Bank-specific profitability determinants

The first determinant, which we will use in our analysis, is the liquidity ratio. Liquidity ratio is an important determinant for ongoing banking operations. Without the necessary liquidity to meet its customers' obligations, the bank would have to borrow from more expensive sources of funds, reduce its profitability and in the worst case could even go bankrupt. Thus, the higher the liquidity ratio, the bank is in a better position and less vulnerable to a bank failure. On the other hand, the lesser the amount of funds held in liquid investments, the greater the expected profitability index Eichengreen and Gibson (2001). As a measure of liquidity in this study we will follow Mamatzakis and Remoundos (2003) and we will use the ratio of loans to assets -LA. It would be better to use the ratio of liquid assets to total assets as a better proxy for liquidity - however, data is unavailable. The main disadvantage of ratio of loans to assets is that it portrays nothing regarding the liquidity of the financial system's assets Vlastarakos (2009). It shows nothing about the nature of the liabilities either. According to Bourke (1989) there is a positive and statistically significant relationship between bank liquidity and profitability. Unlike Bourke (1989), Molyneux and Thorton (1992) in their study pointed out that there is a negative correlation between liquidity and profitability of the bank. In this paper we expect from this determinant to be ambiguously correlated with the profitability of the bank.

The relationship between bank size and profitability, has been one of the most widely used determinants which studied these relationship, but with no consensus on the direction of its influence, as the studies produced mixed results. The effect of a growing size has benefits like economies of scale and reduced costs or economies of scope and product

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diversification, that provide access to markets that small banks cannot entry. In addition, large banks may be able to exert market power through stronger brand image or implicit regulatory (too-big-to-fail) protection. As a result, bank size will positively affect profitability. For example, Smirlock (1985) proves a significant and positive impact of a bank's size on its profitability. Short (1979) goes further by claiming that size has a positive influence on profitability through lowering the cost of raising capital for big banks. The studies by Bikker and Hu (2002) Goddard et al. (2004) and Košak and Čok (2008) support the proposition that increasing a bank's size positively affects profitability through cost of capital. Also the study by Goddard et al. (2004) shown a positive and significant relationship between bank performance and bank size when there is a significant economy of scale. But, if the bank becomes extremely large in size, the ability of bank to diversify their products may lead to higher risk and lower return, because the bank is harder to manage and also due to bureaucratic and other reasons. For example, some researches Athanasoglou et al. (2008), showed that size negatively affected bank profitability, while others, including Berger et. al (1987), Goddard et al. (2004), Anthanasoglou et al. (2005), identified only slight relationship between size and profitability. In other words, the effect of size could be non-linear, with profitability initially increasing with size and then declining for bureaucratic and other reasons Athanasoglou et al. (2008). In this paper we will follow Athanasoglou et. al (2005) and we use the banks' logarithm of real assets-LSIZE and their square-LSIZE2 in order to capture this possible non-linear relationship.

The next determinant that we will test in our model is bank capital to total assets of the banks - CA. The capital of the bank is the ultimate line of defense against the risks in terms of technical insolvency of the bank. This is especially evident in conditions when the bank faces serious problems in asset quality and when reserves for credit losses are not sufficient to cover bad loans. In that case, the excess of bad loans are written off against capital. Therefore, this indicator is considered as an essential indicator of capital security of a bank. We expect this determinant to be ambiguously related to bank profitability

Credit risk - CR is associated with the size of the reserve for loan losses over total loans. If we have a higher indicator, it means that the quality of the portfolio is worse because there is a higher risk of the loan portfolio. For these determinant we can't anticipate in advance what will be the relationship with profitability of banks for the following reasons. Onone hand, the hypothesis about the relationship of risk and return implies that there is a positive relationship between risk and profitability. The higher risk implies higher profitability of the bank. On the other hand, the negative relation is also possible.Namely, higher ratio of reserve for loan losses over total loans can also indicate a higher credit risk due to an increasing number of potentially default borrowers (unpaid loans) which may mean creating a poor quality of assets that could decrease profitability (negative relationship).

Superior workforce is a prerequisite for achieving profitability and stability of a bank. Namely, the main intention is to increase productivity and therefore profitability. If employees are motivated (by salaries, benefits, power or prestige) and if they have discretion to pursue their own objectives, they will increase efficiency and therefore will raise profit of the bank. The opposite situation will occur if quality of the staff is low, and where some employees will not exert full effort. Hence, workforce should lead to better results, but it is too hard to measure this quality directly like in the case of other

determinants. We suppose that the quality should be reflected in the operating expenses or more precisely in salary expenses, expressed by the salary expenses to assets ratio – SEA Mamatzakis, and Remoundos (2003).

3.1.2. Industry-related determinants

The first determinant of group of industry-related determinants which we will use in our analysis is the concentration in the banking sector. According to the Structure-Conduct Performance theory, banks in highly concentrated markets tend to collude and therefore earn monopoly profits (Short 1979 and Gilbert 1984). This is because banks in more concentrated markets should be capable of adjusting spreads in response to unfavourable changes in the macro-economic environment to leave returns unaffected (Flamini, McDonald and Schumacher 2009). As we have seen in the Section 2, there is no unified theoretical view on the impact of the concentration of the banking sector on the profitability of the bank. Except in theory, these dilemmas are confirmed in practical research. The studies of Molyneux and Thorton (1992) and Bourke (1989) found that concentration in the banking industry should lead to monopolistic profits for some banks. However, various studies have found no evidence in favour of the SCP hypothesis. Staikouras and Wood (2003) in their study of EU banks for the period of 1994–1998 did not find support for the SCP hypothesis. In a study of Australian banks, Williams (2003) puts forward some results claiming that concentration reduces profits of the foreign entrants serving as a barrier to entry. The Gilbert (1984) found that out of 47 studies, only 27 support the thesis that says that in concentrated banking environment, banks have higher profits. From the above mentioned explanation for this determinant we expect to be ambiguously related to bank profitability.

In this study as a measure of concentration we will use the Herfindahl-Hirschman index – HHI. It is calculated according to the share of each bank in the overall category is analyzed as (total assets, total deposits, etc..). For the purposes of our paper we will use the total assets of the banking sector in the country. When the index is in the interval from 1,000 units to 1,800 units, the level of concentration in the banking system generally is considered acceptable.

The last industry-related determinant which we will use in this paper is the EBRD index of banking sector reform in the country. Using this index we can identify progress in several areas such as: i) the adoption of regulations in accordance with international standards and practices, ii) implementation of better and more effective supervision, iii) privatization of state banks and iv) write-off of bad loans and closing insolvent banks. This index provides a ranking of the progress of liberalization and institutional reform of the banking sector, on a scale of 1 to 4 +. If the result is 1, it is a small change from the socialist banking system while the result of 4 + represents a level of reform that are approaching the institutional standards and norms in developed countries with a market economy. In a study conducted by Athanasoglu et al (2008), it is concluded that this variable has a negative and statistically significant impact on banks' profitability. The authors conclude that reforming the banking sector and its outreach to the banking sector in the developed countries has a positive influence on the improvement of competitiveness, but at the same time reduces the

profitability of banks. Unlike the previous study, in the research conducted by Košak, and Čok (2008) they find a positive relationship between the EBRD index and profitability of banks. For this determinant also we expect to be ambiguously related to bank profitability.

3.1.3. Macroeconomic determinants

Another group of determinants that is affecting the profitability of banks are macroeconomic determinants. GDP growth - GDPG is one of the most common determinants for measuring economic activity in a country. In literature, the GDP growth is positive and statistically significant determinant on profitability of the banks (Demirguc-Kunt and Huizinga, 1999; Bikker and Hu, 2002; Athanasoglou et al., 2008). On the basis of these studies we expect GDP growth to have a positive impact on the profitability of the banks.

Inflation is the second macroeconomic determinant that is affecting costs and revenues of all institutions, including banks – INF. First author who has researched the impact of inflation on the profitability of banks was Revel (1979). According to his research the impact of inflation on the profitability of banks depends on whether the bank costs rise faster than inflation. Thus the impact of inflation is in collision with macroeconomic stability that allows prediction of the rate of inflation. According to Perry (1992), the effect of this determinant on the profitability of banks, largely depends on whether the bank is able to anticipate or not inflation. Studies conducted by Molyneux and Thorton (1992) and Bourke (1989) showed that a higher rate of inflation leads to realization of higher profits.

Apart from the actual determinants in the empirical model, we will include two dummy variables. Thereby, with DUM will be marked the global economic crisis that has value 1 for the period from September 2008 to December 2009 and 0 for all other periods. With DUM1 will be designated the European debt crisis that has value 1 for the period from January 2011 to December 2012, and 0 for all other periods. The general specification of model (1) is:

$$y_{it} = \mu + \sum_{j=1}^{J} \beta_j X^{j}_{it} + \sum_{l=1}^{L} \beta_l X^{l}_{it} + \sum_{m=1}^{M} \beta_m X^{m}_{it} + DUM + DUM1 + \varepsilon_{it} \quad (4)$$

3.2. Data Source and Sample Characteristics

Data of the dependent determinants ROA and ROE, are taken from the annual financial reports from the banks in the Republic of Macedonia. Data for the independent determinants are taken from different sources. The, individual bank-level data (banking size, liquidity ratio, banking capital to total assets, credit risk and employees costs were obtained from the annual financial reports from the banks that were included in the model. The data for concentration ratio was obtained from the National Bank of Macedonia, while data from the second industry-related determinant was obtained from the EBRD Transition reports. The data for macroeconomic determinants (GDP growth and inflation) ware obtained from the National Bank of the Republic of Macedonia. In order to put on a

quarterly basis, the data will be interpolated with linear interpolation and will cover the period from 2007q1 to 2013q4. The data was chosen due their availability, because before 2007 there are a lack of data and in the sample was included all banks in the Republic of Macedonia.

Table 1 presents descriptive statistics for the determinants involved in the regression model. Key figures, including mean, standard deviation, min and max value are reported. This is generated to give overall description about data used in the model and served as data screening tool to spot unreasonable figure.

Table 1

Descriptive statistics

	ROA	ROE	LA	LSIZE	CA	CR	SEA	HHI	EBRD	GDPG	INF
Mean	-1.027779	0.287534	53.77217	5.049253	17.13043	10.71563	2.141052	1549.611	2.967857	0.862982	3.104871
Median	0.361250	2.675000	57.37500	4.899697	12.32500	8.425000	1.566250	1578.000	3.000000	0.480000	3.000000
Maximum	4.500000	26.85000	76.60000	7.252762	81.70000	41.40000	18.54000	1637.000	3.000000	3.100000	9.262500
Minimum	-51.10000	-78.40000	11.00000	2.041220	4.300000	1.700000	0.000002	1410.000	2.700000	-0.400000	-0.800000
Std. Dev.	6.712613	16.42105	14.96659	1.258192	13.27935	7.894741	2.062967	66.96900	0.092899	0.859350	2.254887
Observations	388	388	388	388	388	377	416	420	420	420	420

Source: Autor calculation.

According to Table 1, the industry-specific and macroeconomic determinants comprise all 420 observations, and there are not missing values. But, there were missing observations in all bank-specific determinants. This is due to missing reported figure in annual financial reports from some banks. Further on, for each determinant we calculated mean, median, minimum, maximum value and standard deviation.

As can be seen, ROA determinant is the only one having negative mean value of -1.027779, which goes to the maximum of 4.500000 and minimum of -51.10000, with standard deviation of 6.712613. The negative mean value is due to the period when the data is collected, that covers the years of the world economic and financial crisis, and European debt crisis and their effect spilled over the Macedonian banking system, too. The mean value from ROE is positive and has mean value of 0.287534, with maximum of 26.85000 and minimum of -78.40000. ROE has second largest standard deviation with 16.42105. These deviations happened because one bank had unusually high earnings in 2010 (as it did not provide enough loan-loss provisions) and unusually low earnings in 2011. Similarly, another bank had the highest negative ROA values in the course of four years due to huge operating expenses that could not be covered even from both interest and non-interest income together. Under these circumstances, we decided to continue the analysis with these outliers. As Table 1 shows, concentration presents larger standard deviation with 66.97 compared with other determinants. It revealed that the concentration in the banking sector in the Republic of Macedonia has more significant variance than other determinants. Namely, three banks account for 61.1% of the total assets, while nine banks constitute less than 4% (NBRM, 2013, p. 57). But in the last years, the share of the top three i.e. five banks slightly decreases in all segments of banking operations.The reduction in the concentration is mainly a result of the faster growth of banks that follow after the first three, or better, five banks with the largest share for each segment (NBRM, 2013, p. 57).

The macroeconomic determinants present small standard deviation, which implies that macroeconomics in the Republic of Macedonia during the period of 2007 to 2013 remains reasonably stable.

3.3. Panel unit root test

The empirical model given by equation (4) forms the basis of our estimation. When we used these model the first step was to verify that all determinants are integrated with the same order. However, it has been widely acknowledged that standard unit root tests can have low power against stationary alternatives for the important cases, Campbell and Perron (1991). As an alternative, recently developed panel unit root is applied. In this paper, we test for stationarity of the panel, using a Maddala and Wu panel unit root test for unbalanced panels. Maddala and Wu (1999) proposed a Fisher-type test which combines the p-values from unit root tests for each cross-section i. The test is nonparametric and has a chi-square distribution with 2n degrees of freedom, where n is the number of countries in the panel. They state that not only does this test perform best compared to other tests for unit roots in panel data, but it also has the advantage that it does not require a balanced panel, as do most tests. The test statistic is given by;

$$\lambda = -2\sum_{I=1}^{n} \log_e(p_i) \sim \chi^2 2n(d,f) \tag{5}$$

Where p_i is the p-value from the ADF unit root tests for unit i.

3.4. Econometric methodology

In the literature which investigates the bank profitability, the autors usually apply ordinary least squares methods or fixed or random effects models (Bourke,1989; Molyneux and Thornton, 1992; Athanasoglou et. al (2005), Goddart et. al (2004). But, given the dynamic nature of our model (certain determinants which are dynamic in their nature, it is expected that their current behaviour depends on their past behaviour) least squares estimation methods produce biased and inconsistent estimates Baltagi (2001). Namely, bank profits show a tendency to persist over time, reflecting impediments to market competition, informational opacity and/or sensitivity to regional macroeconomic shocks to the extent that these are serially correlated Berger et al. (2000). Therefore, we follow (Athanasoglou et al. 2008; García-Herrero et al. 2009; Dietricha, and Wanzenried 2010) and we adopt a dynamic specification of the model by including a lagged dependent determinant among the regressors. These dynamic relations are given by next equation:

$$y_{it} = \mu + \delta y_{i,t-1} + \sum_{j=1}^{J} \beta_j X_{it}^{j} + \sum_{l=1}^{L} \beta_l X_{it}^{l} + \sum_{m=1}^{M} \beta_m X_{it}^{m} + DUM + DUM\,1 + \varepsilon_{it} \tag{6}$$

where i denotes individual and t denotes time, μ is an intercept, δ is a is the speed of adjustment to equilibrium and $\beta_1, \beta_2, ... \beta_K$, are the parameters of explanatory determinants. It is assumed that ε_{it} are IIN $(0, \sigma_v^2)$, δ measures the speed of mean reversion. A value of δ between 0 and 1 indicates that profitability is persistent but will eventually return to the equilibrium level. A value close to 0 means denote a high speed of adjustment and imply that the industry is fairly competitive, while a value of δ close to 1 implies less competitive structure (very slow adjustment). Eichengreen and Gibson (2001).

But, in dynamic relationships econometric analysis of equation (6) will confront the following problems/challenges. Namely, estimation of bank profitability refers to the endogeneity problem. More profitable banks, for example, may be able to increase their equity more easily by retaining profits García-Herrero et al. (2009). Similarly, they could also pay more for advertising campaigns and increase their size, which, in turn, might affect profitability. But, the causality could also go in the opposite direction, because the more profitable banks can hire more personnel, and thus reduce their operational efficiency. Another problem is unobservable heterogeneity across banks, which exists in our sample. Therefore, we suspect a dynamic structure of our basic model with lagged profits included to be more efficient in determining the current period's performance. Yet, including a lagged dependent determinant in the model can cause autocorrelation.

Consequently, we will proceed with the estimation of our basic model using the generalized method of moments (GMM) panel estimator, developed for dynamic panel models by Arellano and Bond (1991) and Arellano and Bover (1995). Arellano and Bond proposed one - and two-step estimators. In this paper we use the one-step GMM estimator since Monte Carlo studies have found that this estimator outperforms the two-step estimator both in terms of producing a smaller bias and a smaller standard deviation Judson and Owen (1999).

In order to use the Arellano and Bond model we set all explanatory determinant to be strictly endogenous besides GDPG, HHI and INF. Such treatment of these determinants is consistent with the literature Trujillo-Ponce (2013). The validity of chosen instruments for parameters estimation can be tested using the Sargan test. Accepting the null hypothesis means that the chosen instruments are valid.. The second group of test refers to tests of serial correlations in the differenced residuals – (first-order (m1) and second-order (m2) serial correlation). The first-order autocorrelation in the differenced residuals does not imply that the estimates are inconsistent Arellano and Bond, (1991:282). However, the second-order autocorrelation would imply that the estimates are inconsistent. We also report Wald tests of the joint significance of both the coefficients and the dummies, which validates the use of such determinants in our equation.

4. Empirical Results

In this section we begin with analysis of the results of the panel unit root tests. The results of this test are presented in Table 2. The null of non-stationarity is rejected at the 5% level for all determinants but EBRD. We continue with the estimation of the model not excluding this determinant, since we are less likely to get spurious results given that the dependent variables are stationary.

Table 2

Maddala and Wu panel unit root test

Dereminants	ROA	ROE	LA	LSIZE	CA	CR	SEA	HHI	EBRD	GDPG	INF
Test-statistic	61.5446	46.6941	77.0235	58.6712	50.8329	53.3440	46.1895	48.6642	2.475	107.589	165.651
Prob. value	0.0006	0.0266	0.0000	0.0013	0.0052	0.0054	0.0298	0.0170	0.1598	0.0000	0.0000

Source: Autor calculation.

Next in Table 3 we reports the empirical estimations of Equation (6) for both measures of bank profitability (ROA and ROE) in Republic of Macedonia during the 2007-2013 period, using the generalized method of moments (GMM) one step panel estimator, developed for dynamic panel models by Arellano and Bond (1991) and Arellano and Bover (1995).

Table 3

Estimation Results

	ROA	Std. Error	p-value	ROE	Std. Error	p-value
ROA(-1)	0.073**	0.049	0.038			
ROE(-1)				0.061*	0.046	0.084
Const	0.114	0.110	0.299	0.463*	0.267	0.083
LA	-0.135***	0.036	0.0001	-0.151*	0.083	0.068
LSIZE	6.106	3.960	0.123	39.246***	9.107	0.00002
LSIZE2	-19.421	18.48	0.293	-145.735***	42.637	0.00063
CA	0.256***	0.061	0.00003	0.500***	0.136	0.00025
CR	-0.649***	0.053	0.00001	-1.371***	0.121	0.00001
SEA	-0.383**	0.191	0.044	-0.213	0.434	0.624
HHI	-0.006	0.007	0.383	-0.020	0.017	-0.238
GDPG	0.083	0.440	0.849	-0.698	1.004	0.486
INF	0.365*	0.193	0.058	0.471	0.438	0.282
DUM	-0.374	1.125	0.739	-1.544	2.564	0.547
DUM1	-0.602	0.941	0.521	-5.125**	2.180	0.018
Test for AR(1) errors	-9.6245		0.0000	-10.074		0.0000
Test for AR(2) errors	1.22029		0.2224	0.373		0.7088
Sargan over-identification test (p-value)			0.7351			[0.9473
Wald (joint) test (p-value)			0.0000			0.0000

Source: Autor calculation.
1. Arellano-Bond test that average autocovariance in residuals of order 1 is 0 (HB0B: No autocorrelation).
2. Arellano-Bond test that average autocovariance in residuals of order 2 is 0 (HB0B: No autocorrelation).
*,** and *** show that the null hypothesis can be rejected at 10%, 5% and 1% significance levels respectively.

The model seems to fit the panel data reasonably well, having fairly stable coefficients, while the Wald test indicates fine goodness of fit. The Sargan test shows that the chosen instruments are valid (with *p*-value of 0.7351, for ROA, and p-value of 0.9473 for ROE). The estimator ensures efficiency and consistency provided that the residuals do not show serial correlation of order two (even though the equations indicate that negative first-order autocorrelation is present, this does not imply that the estimates are inconsistent. Inconsistency would be implied if second-order autocorrelation was present Arellano and Bond (1991), but this case is rejected by the test for AR(2) errors).

The high statistical significances of the lagged profitability variables also confirm the dynamic character of the model specification. The values of δ are close to 0.07, for ROA, and 0.06 for ROE, which indicates slow speed of adjustment to profitability trends in the banking sector i.e. fairly competitive Macedonian banking sector. The results for ROA is similar to that found by previous study in the Macedonian banking sector (e.g., Ćurak et al. 2011). The significant coefficient of the lagged profitability variable confirms the dynamic character of the model specification.

The effect of bank-specific determinants is in line with expectations**.** The first determinant loans to assets ratio has negative and significant relationship with profitability which results is consistent with Molyneaux and Thornton, (1992). The estimated coefficient corresponding to this suggests that an increase in liquidity will cause a decline in profitability. These findings highlight the trade-off between liquidity and profitability. Namely, the more resources that are tied up to meet future liquidity demands, the lower the bank's profitability. The problem of ensuring adequate liquidity while not negatively impacting performance requires skilful management.

The estimated equations when ROA is the dependent determinant show that the effect of bank size on profitability is positive and statistically significant, while the relationship is linear (the square of bank assets is negative and also statistically significant). This result implies that there exist economies of scale to exploit up to a marginal point. The results are consistent with the paper of Iloska (2014), but inconsistent with paper of Ćurak et al. (2011). The European Commission (1997), in investigating the cost characteristics of various European banking sectors, reported that as banking systems approach a higher level of sophistication in terms of technology and productivity, opportunities from exploiting economies of scale might be quite limited. Hence, we expect this relationship to weaken over time.

Turning to the other bank-specific determinants, the coefficient of the capital to total assets of the banks - CA, for ROA and ROE, have positive and highly significant effect on profitability, reflecting the sound financial condition of banks in the Republic of Macedonia. This result is in line with Košak and Čok (2008) and Ćurak et.al (2011).   A bank with a sound capital position is able to pursue business opportunities more effectively and has more time and flexibility to deal with problems arising from unexpected losses, thus achieving increased profitability.

In contrast, credit risk - CR is negatively and significantly related to bank profitability. The sign of the coefficient indicates that the higher the credit risk assumed by a bank, the higher the accumulation of defaulted loans. The results are consistent with the paper Košak and

Čok (2008). In turn, the higher the level of loans in default, the greater the negative impact on bank profitability. Although credit risk management is significantly improved over the past years, the banks still fail to implement appropriate and effective strategies for managing credit risk. Poor quality of loan portfolios that were inherited from the past and the great credit expansion in 2006-2008 with negligible credit risk assessments are important reasons for the negative relationship between credit risk and profitability of banks in the country.

As we expected, the value of the salary expenses to assets ratio – SEA, has a negative and significant effect on profitability, when ROA is dependent determinant. These results show that an increase in these expenditures reduces the profitability of the banks in the Republic of Macedonia. The results are consistent with the paper of Ćurak et.al (2011) and follow Mamatzakis and Remoundos (2003), but inconsistent with paper of of Iloska (2014). A significant and negative empirical relationship between SEA and profitability is not surprising. A possible explanation may be that, banking sector in the country in the past twenty years of transition inherited a high degree of over-employment and their reduction to the optimal level requires a longer period of time. Namely, banks in the Republic of Macedonia have not yet reached the optimal number of employees for the assets under management, so the voluntary retirement schemes should be continued, underlying idea being to further reduce operating costs. In other words, banks should increase their profits by improved labour productivity, which, among other things, could be a result of the higher quality of newly hired labour and the reduction in the total number of employees.

The inflation appears to have a positive and significant impact on bank profitability. This positive result implies that during the period of the study inflation was anticipated by the banks management, which in turn implies that interest rates have been appropriately adjusted to achieve higher profits. In addition this implies that, with inflation, bank income increases more than bank costs, which may be viewed as the result of the false inflationary expectations by bank customers (comparative to bank managers) to forecast future inflation. Therefore, above normal profits can be extracted from the asymmetric information evidently present in the Republic of Macedonia. Some studies offer another explanation for positive affect of inflation on bank profitability and show that banks obtain higher earnings from float or because there are delays in crediting customer Demirguc-Kunt and Huizinga (1999). Our results are consistent with the findings of (Athanasoglou et. Al. 2006; Olson and Zoubi, 2011; Flamini et al. 2009), who analyze low- and middle-income countries. Inflation in high-income countries negatively affects banks profits before the crisis, but not thereafter. Adjusting interest rates seems to be difficult for bank managers acting in these highly competitive markets where inflation rates are of less importance than in developing countries.

Another explanation for the positive interaction between inflation and profitability of the banks could be the different pricing of deposits and credits. But in Macedonia, interest rates on majority of deposits can also be changed before maturity, so that argument is not applicable for Macedonian banking sector, although it is probably valid for other countries.

As we mentioned above, the only two determinants that are not significant in our model are concentration and GDP growth. Namely, the empirical results show that concentration affects bank profitability negatively, but this effect is insignificant. Hence, this study finds

no evidence to support the SCP hypothesis. This outcome is in accordance with Berger (1995), which claims that concentration is usually negatively related to profitability. In the present study, two shortcomings emerge: Firstly, as discussed above, the low value of the coefficient of the lagged profitability variable is consistent with low market power. Secondly, and in line with Berger (1995), our estimations show that even though there was a fall in the HHI in 2013[3] suggesting that the industry was moving to a more competitive structure and hence profitability should have declined, the improvement of the managerial practices (captured by the bank-specific determinants) resulted in increased profitability. Furthemore, The fact that our empirical study showed that market concentration was not significant determinant of banking profitability in Macedonia, besides inadequate choice of proxies, could also be at least partially explained by the situation in the three biggest banks during the analyzed period (Q1 2007 to Q4 2013). These three banks absolutely dominate the banking system, but during and several years after the crisis, two of them, which are foreign owned, didn't have any financial support by their parent banks, which faced serious difficulties in that time..The third one is not strategically owned by foreign owners, but recorded significant increase in NPLs in the same period.

The empirical results for GDP growth show positive, but also, insignificant effect on bank profitability. These results are consistent with the findings of (Constantinos and Voyazas, 2009; Dietrich and Wanzenried, 2010). These results are surprising since the banking sector is sensitive to the overall development of the economy. Namely, bad economic condition can worsen the quality of the loan portfolio generating credit losses, which eventually reduce bank's profits. Furthermore, banks' profits might be pro-cyclical because GDP growth also influences net interest income via lending activity as demand for lending by households and enterprises is increasing (decreasing) in cyclical upswings (downswings).

Since non-bank financial institutions in the Macedonian financial system are still undeveloped, household savings dominantly flow to banks. Consequently, as Macedonian capital market is undeveloped, bank credit is primary source of enterprise financing.

From the dummy variables, only dummy variable that is introduced in order to cover the European debt crisis is statistically significant at the 5% level of significance, when ROE is dependent determinant. This result is not surprising, because as a result of the European debt crisis banks refrain from taking risks. Namely, banks have directed part of their potential to further strengthen their liquidity position, through investments in low-risk domestic securities and on accounts in foreign banks, where the credit risk is low, but also the profit is lower. The profit shown at the end of the 2011 is only half of that achieved in the previous year NBRM (2011). Reduced profitability of banks in 2011, adversely reflected on the indicators of return on assets and equity. Also, further upward trend of operating costs led to reduced operating efficiency of banks, i.e. their ability to raise revenues to cover costs of operation.

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[3] The reduction in the concentration is mainly a result of the faster growth of banks that follow after the three or five banks respectively with the largest share for each segment.

5. Conclusion

Using the generalized method of moments (GMM) one step panel estimator this paper has examined how bank-specific, industry-specific and macroeconomic determinants affect profitability of banks in the Republic of Macedonia over the period from 2007 to 2013. This is the first study which applied panel analysis to examine the determinants of bank profitability in Macedonia. To the knowledge of the authors, this paper, represents a first attempt to test empirically the relationship between two dummy variables and bank profitability, not only in Macedonia, but generally. We introduced these two dummy variables to cover the impact of the global economic crisis (DUM2008 and DUM2009).

According to the regression results, loans to assets ratio has negative and significant relationship with profitability. The explanation may be that the Macedonian banking sector registered a high value of this indicator in the pre-crisis period, which caused an increase in banks income, with a positive impact on profitability. However, due to the financial crisis, these banks recorded a significant increase in the level of nonperforming loans and loan loss reserves, which had a negative impact on profitability. Overall, through the compensation of the two effects it results in a negative and statistically significant impact.

The effect of bank size on profitability is positive and statistically significant, while the relationship is linear (the square of bank assets is negative and also statistically significant), when ROA is the dependent determinant. This result implies that there exist economies of scale suggesting that higher profits can be derived from mergers in Macedonian banking. Therefore, by merging banks could attract more customers and earn higher profits. The negative quadratic effect of size indicates that there is point after which the increase in a bank's size provides diseconomies of scale due to bureaucracy and other difficulties in operating a large structure.

As we expected, exposure to credit risk lowers profits, showing that the banks in the Republic of Macedonia should focus more on credit risk management, which has been proved problematic in the nineties. Serious banking problems have arisen from the failure of banks to recognise impaired assets and create reserves for writing-off these assets.

We find that capital to total assets ratio has a positive and significant effect on bank profitability, for both dependent determinants ROA and ROE, which means that banks with a higher leverage ratio are relatively more profitable. Killian (2010), says that higher common equity requirements of Basel III (from 2% to 4.5%) could be expected to reduce bank profitability as expressed by return on common equity, put pressure on earnings per share and lower growth potential. However, the new capital requirement rates of Basel III do not affect bank profitability in the Republic of Macedonia. Namely the research has shown that the ratio of capital adequacy in the Macedonian banking system of 17% is among the highest compared to the considered countries CEE Strategic Analysis (2012). In this context it is important to mention that the necessary increase in the required capital may be an important issue for small-sized banks. These banks could raise the capital through their enlargement. The process of bank consolidation is supported by NBRM and is expected to continue in the future in order to improve profitability, competitiveness in the banking system and improve the quality of the banking services. But, to what extend the

introduction of these standards will affect the profitability of the Macedonian banking sector no one can be sure of.

Additionally, salary expenses to assets ratio has a negative and significant effect on profitability, when ROA is dependent determinant, showing that increase in these expenditures reduces the profitability of the banks in the Republic of Macedonia. One possible explanation may be that, banking sector in the country in the past twenty years of transition inherited a high degree of over-employment and their reduction of the optimal level requires a longer period of time. Bank profitability could be increased by improved labor productivity, which, among other things, is a result of the higher quality of newly hired labor and the reduction in the total number of employees.

From the industry-specific and macroeconomic determinants, we found only for inflation to be of significant influence on bank profitability, when ROA is dependent determinant. This positive result implies that inflation was anticipated by the banks management,), which in turn implies that interest rates have been appropriately adjusted to achieve higher profits. Also this implies that, with inflation, bank income increases more than bank costs, which may be viewed as the result of the false inflationary expectations of bank customers (comparative to bank managers) in forecasting future inflation.

Possibly most surprising was the statistical insignificance of the concentration and GDP growth determinant. Although these characteristics have been highlighted in the literature as determinants of profitability in numerous countries, they were unable to explain the profitability of banking sector in the Republic of Macedonia. This may be due to the inadequacy of the proxies used to represent these determinants to accurately reflect the level of competition and economic activity in relatively under-developed banking sector. Our results therefore do not suggest that economic activity and the level of bank competition are not determinants of profitability, but rather indicate the need for the formulation of new proxies that are better able to measure the degree of competition in banking sectors and economic activity in the Republic of Macedonia.

6. Recommendations

Taking into account the results of the above analyzes in the future, banks in the Republic of Macedonia will face several challenges that will have an impact on their profitability. First, the impact of economic crisis will probably continue to cut capacity and opportunities for development in the industry and affect the ability of borrowers to repay their loans, which is already causing banks to allocate more reserves to cover uncollected loans which reflects on their profitability. Second, although banks in the country are not very active at the international level, but given the fact that over 70% of banks in the country are owned by banks that originate in the EU can not exclude the possible complications that may arise as a result of turbulence in the European Union with a consequent increase in the cost of banks. Finally, pending preparation of banks to implement Basel III may reduce the profitability of banks, given that the future will impose higher capital requirements that could have a positive effect on ROA (negative effect on ROE). In addition, if banks in the

country want to maintain their stability and to realize satisfactory rate of profit in this period (mainly due to the reduction in their lending activities, while increasing the number of outstanding loans) they have to be restructured (mainly by reducing the number of branches and employees), because, according to the results of the analysis, an increase in these expenditures reduces the profitability of the banks, while reforming their labor can contribute to strengthening their capital ratios and improve their corporate governance.

As a direction forward for future research , it would be beneficial to examine the impact of bankspecific determinants that were not included in our model, such as non-interest income, ownership, probabilities of default (PD), loss given default (LGD). Also the research may be improved by including othermacroeconomic determinants such as unemployment norm, volume and price indicators of the real estate market, the impact of taxes, exchange rate.etc. In addition, future studies could apply a longer or different time period and to analyze other countries in order to compare how the determinants affect bank profitability in different countries with different financial systems and different regulatory rules.

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