



Service sector in terms of changing environment

Profitability Determinants of the Macedonian Banking Sector in Changing Environment

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Abstract

This paper analyzes bank-specific, industry-specific and macroeconomic determinants of bank profitability. Dynamic panel analysis is applied 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.

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Keywords: Determinants of profitability; Macedonian banking sector; Dynamic panel analysis

1. Introduction

According to the theoretical and empirical works bank profitability is determined by various firm-specific, industry-specific and macroeconomic variables. Although there are researches that among banking sectors in European transition countries, include Macedonian as well, there is a lack of works that are exclusively focused on the analysis of bank performances in the Republic of Macedonia. According to the authors' best knowledge, there is just one study on competition and efficiency of Macedonian banking sector (Giustiniani & Ross, 2008) but no one deals exclusively with profitability.

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In the last years the transformation of the Macedonian banking system has been continued. The changes include banking regulation, consolidation and entry of foreign banks as well as the changes in bank activities and performances.

The changes in the banking regulations (such as the new Banking Law adopted in 2007), and areas of supervision and inspection were generally aimed at improving the operations of banks, restraining the level of their exposure to systematic risk, and reaching greater conformity with the internationally adopted laws and standards for banking activities (e.g. Basel). Regarding the risk, for example, the credit registries that started at the end of 2010 were aimed not only at increasing the credit activity and availability, but at monitoring and covering the bank's credit exposure as well.

During the analyzed period from 2005 to 2010 the process of consolidation of the banking system progressed. The number of deposit institutions decreased and there were 18 banks and 8 saving houses at the end of 2010. The ownership transformation went towards dominance of foreign shareholders. Namely, the share of foreign ownership in total capital of banking system amounted 72.9 per cent in 2010. Despite the changes, the level of concentration was not changed in the period. It remained the same at the level of 66 per cent, measured by the share of the three banks with the largest assets in total assets of the banking system (NBRM, 2011).

In the structure of the assets of the banks in the Republic of Macedonia, the credit to non-financial units was getting the importance, primarily at the expense of credit to banks and other financial institutions. On the other hand, there was no significant change in the structure of the liabilities. Regarding the capital adequacy, although it decreased during the period, at the end of 2010 it was twice higher than it is required by the law. Namely, it amounted 16.1 per cent while the minimum prescribed rate is 8 per cent (NBRM, 2011).

The income structure is characterized by dominance of the net interest income which even grew in the importance during the analyzed period. The operating costs had the largest share in the total amount of bank expenses. Finally, the profitability of the banking sector was very variable with highest level of return on average assets (ROAA) of 1.8 per cent and the lowest level of 0.6 per cent in 2009 during the crisis period (NBRM, 2011).

There is a question to what extent are the common determinants of bank profitability relevant in the banking system in Macedonia. Thus, the aim of this paper is to analyze factors that affect profitability of banks in Macedonian banking sector. Both internal and external determinants of bank profitability are examined. The analysis is based on the sample of 16 banks in the period between 2005 and 2010. Regarding the methodology, in the empirical part of the work the GMM technique for dynamic panel analysis is applied.

The rest of the paper is structured as follows. Section 2 discusses the existing literature on determinants of bank profitability. The data, variables and methodology are presented in the Section 3. Section 4 presents the empirical results and section 5 concludes the paper and gives policy recommendations.

2. Determinants of bank profitability

This section reviews the relevant literature on the determinants of bank profitability and the most important results of the recent empirical studies. In the existing literature, the identification and analyses of the bank profitability determinants are performed either within an individual country, e.g. Greece (Kosmidou, 2008) and Croatia (Pejić Bach, Posedel & Stojanović, 2009; Pervan, Pervan & Guadagnino, 2010; Kundid, Škrabić & Ercegovac, 2011) or among several, usually developed, countries (Pasiouras & Kosmidou, 2007; Goddard, Molyneux & Wilson, 2004). Recently, this issue has become increasingly appealing in the context of developing, e.g. South-Eastern European (SEE) countries (Bonin, Hasan & Wachtel, 2005; Košak & Čok, 2008; Athanasoglou, Delis & Staikouras, 2006).

The determinants of bank profitability can be grouped into internal and external. Internal, micro or bank-specific determinants reflect bank-specific features such as size, capital, risks and efficiency.

External determinants are factors that are not related to bank management but reflect the specifics of the industry and macroeconomic environment that affect the performance of the financial institution. Most of the studies concluded that the internal factors explain large portion of bank profitability, however, the results vary across countries since both datasets and environments differ (Athanasoglou, Brissimis & Delis, 2008). Therefore, the latest studies consider the combination of both internal and external factors, namely bank-specific, industry-specific and macroeconomic.

Size usually accounts for existing economies of scale in the market (Athanasoglou, Brissimis & Delis, 2008). Namely, due to their size, larger banks are more able to exploit the advantage of economies of scale in transactions which ultimately results in higher profits. Additionally, large banks may be able to exert market power through stronger brand image or implicit regulatory (to-big-to-fail) protection (Kořak & Ćok, 2008). Consequently, a positive relationship might be expected between the bank size and its profitability (Kosmidou, 2008; Pervan, Pervan & Guadagnino, 2010). However, the studies produce mixed and not straightforward results – negative size-profitability relation is explained by diseconomies of scale which are present in larger banks especially after the periods of accelerated growth (Kořak & Ćok, 2008). Moreover, in some studies this relation proved to be statistically insignificant (Goddard, Molyneux & Wilson, 2004; Athanasoglou, Delis & Staikouras, 2008).

The bank's risk exposure and the necessity for its management usually encompass solvency risk, liquidity risk and credit risk. Solvency risk is related to the capital strength of the bank and it is considered to be an important factor in affecting and explaining bank profitability. Sufficient amount of equity, measured by ratio of equity to total asset, allows bank to absorb any shocks that it may experience. Higher capitalization, which serves as a safety cushion, implies lower insolvency risk (bank is safer) and according to the risk-return hypothesis, a lower profitability is expected (negative relationship). However, creditworthiness of better capitalized and safer banks encourage the confidence of depositors which lowers interests as funding costs and the need for external financing, thereby lowering interest expenses. Therefore, higher equity to asset ratio (lower risk) would imply higher profitability (positive relationship).

Liquidity risk reflects the possible inability of bank to meet its obligations which can eventually lead to bank failure. The exposure to liquidity risk is usually measured as ratio of loans to deposits (Kosmidou, 2008). In order to reduce the insolvency problems, bank holds higher amount of liquid assets (lower loan to deposit ratio) which can be easily converted to cash. However, liquid assets usually have lower rates of return. Therefore, higher liquidity (lower loan to deposit ratio) would imply lower profitability. In other words, since the loan to deposit ratio is actually an inverse proxy for the liquidity, the higher the ratio, the higher is the bank profitability.

Some authors (e.g. Kosmidou, 2008), describe credit risk as bank asset quality which can be measured through the loan-loss provisions. Higher provisions are expected to negatively influence profitability as provisions indicate higher risk and higher probability of loans to become non-performing (Kosmidou, 2008; Athanasoglou, Brissimis & Delis, 2008; Demircuc-Kunt & Huizinga, 1999). The ratio of bank loans to total asset can also be used as an indicator of credit risk (Kundid, Škrabić & Ercegovac, 2011) (additionally, some authors use this ratio as a measure of bank asset structure and the quality of its management or as an indicator of bank liquidity, e.g. Pervan, Pervan & Guadagnino, 2010). According to the risk-return hypothesis, higher loan to asset ratio means higher credit risk exposure which needs to be compensated through higher returns and improved overall profitability. However, the negative relation is possible. Namely, higher loans to asset ratio can also indicate a higher credit risk due to an increasing number of potentially default borrowers (unpaid loans) which can ultimately decrease profitability (negative relationship).

Apart from lending, which is bank traditional interest-earning activity, bank income can be also generated through non-interest bearing activities. Proportion of fees and commissions in total income can be used as proxy for non-traditional bank activities and as proxy for bank diversification into non-traditional activities (Sufian & Habibullah, 2009). Fees and commissions enhance total income generated,

thus a positive relationship between this indicator and profitability is expected. An additional argument for the positive relationship is that margins in fees and commissions operations are usually higher than margins in interest activities, so the profitability of banks with higher share of non-interest income relative to their total income is expected to be increased (Sufian & Habibullah, 2009).

Efficient cost (expenses) management is another important determinant of bank profitability. It is usually measured by the ratio of operational costs to assets (or income) because only operating expenses can be viewed as the outcome of bank management (Athanasoglou, Brissimis & Delis, 2008). The reasoning suggests negative relationship because improved management of operating expenses (lower cost to asset ratio) improves efficiency and eventually leads to higher profits.

Ownership status of the bank is another factor that has recently draw attention of the researchers in clearing the picture on bank performance determinants. The reasons are various advantages brought by the foreign banks presence such as technological innovations, expertise in risk management and corporate governance, and increased competition which drives improvements in cost management and efficiency (Athanasoglou, Brissimis & Delis, 2008). Despite the above mention advantages, there is no clear empirical evidence to support a positive relationship between foreign ownership and bank performance. Moreover, it needs to be put forward that the results differ whether the performance measure used is cost-based (efficiency) or profit-based (profitability) (see e.g. Kořak & Ćok, 2008). Additionally, the results differentiate between developed and developing countries. In developed countries, foreign-owned banks are less profitable than domestic banks (e.g. Pasiouras & Kosmidou, 2007; Demircuc-Kunt & Huizinga, 1999; Dietrich & Wanzenried, 2008) whereas in developing countries (e.g. SEE) the results prove foreign owners to be more successful in improving cost-driven efficiencies than profit-driven ones (Bonin, Hasan & Wachtel, 2005). Regarding the effect of the private or government ownership on bank performance, there is disagreement among the empirical studies. Some studies find no statistically significant evidence of an adverse effect of government vs private ownership (e.g. Bonin, Hasan & Wachtel, 2005), whereas several support the theory that privately owned banks are more profitable than state-owned banks (e.g. Dietrich & Wanzenried, 2008).

External determinants comprise those that represent industry (market) and macroeconomic characteristics. Aiming to control for external industry features, previous studies (e.g. Pervan, Pervan & Guadagnino, 2010; Kořak & Ćok, 2008; Athanasoglou, Delis & Staikouras, 2006; Claessens, Demircuc-Kunt & Huizinga, 2001) include variables such as bank market concentration and banking sector reform (the latter specific for SEE countries) whereas variables such as GDP level or growth, inflation, interest rates, or financial system features are used to describe macroeconomic conditions.

According to industry-specific factors, bank profitability is function of the attributes of the market in which it operates, such as concentration. The concentration issue usually relates to the two competing hypothesis. According to the Structure-Conduct-Performance, in a concentrated market bank can earn higher profits as it can charge higher interest rates on loans and lower on deposits as a result of collusion and other forms of non-competitive behavior. Thus, the more concentrated the market, as measured by higher HHI concentration index, the less the degree of competition and higher the profits (positive effect of concentration), irrespective of the bank efficiency. Competing Efficiency Structure Hypothesis posits that the market concentration is a result of bank-specific attributes such as higher cost efficiency that allows bank to increase in size and market share which in turn leads to higher market concentration. In this case, variable of market share proxy for bank efficiency. Due to positive and statistically significant influence of concentration on bank profitability, classical SPC hypothesis can be accepted in case of Croatia (Pervan, Pervan & Guadagnino, 2010). The findings obtained in the study of seven SEE countries (including Macedonia) (Athanasoglou, Delis & Staikouras, 2006) are conclusive to a lesser extent because the SCP hypothesis cannot be rejected and the results indicate some relevance of the EFS hypothesis but this however needs further exploration. The results of the study on the degree of competition and relative efficiency (productivity) of Macedonian banking system indicate that competition in the banking sector in the observed period of 1997-2005 continues to be relatively low

(namely market structure tests point toward a finding of monopolistic market structures) and that improvements in bank efficiency have been limited. However, the results should be interpreted in the light of the presence of several small banks which were founded to finance the companies of their owners and consequently might follow somewhat different business objectives (Giustiniani & Ross, 2008).

Several recent studies, which investigated bank profitability determinant in CEE countries (e.g. Kořak & Ćok, 2008; Athanasoglou, Delis & Staikouras, 2006) introduce into the analysis an EBRD index of banking sector reform. This index assesses the transition progress of the banking sectors of formerly centrally planned economies in the segments such as liberalization, deregulation policy, supervision standards, bankruptcy procedures, competition and financial deepening. The index ranges the success of the reform of the banking sector on a scale of 1 (low progress) to 4+ (highest level of reform) (EBRD, 2011). In the analysis of Athanasoglou, Delis & Staikouras (2006), performed on 6 SEE countries (Macedonia included) in the period 1998-2002, the results for the EBRD index suggests a negative and significant effect on bank profitability. Based on the results, the authors conclude that the improvements of the banking sector development positively contributed to the level of competition which reduced market power of individual bank and their profitability. The results obtained in the analysis of Kořak & Ćok (2008) on the sample of 6 SEE countries (Macedonia included) in the period 1995-2004, point to the positive influence of the level of banking sector development on the profitability, however, the significance of this relationship differs regarding the various profitability measures employed.

GDP, which is used as a macroeconomic determinant of bank profitability, measures total economic activity within a country whereas the GDP growth reflects its annual change. GDP growth is expected to have a positive effect on bank profitability according to the literature on the relationship between economic growth and financial sector profitability (Athanasoglou, Brissimis & Delis, 2008; Demirguc-Kunt & Huizinga, 1999). GDP growth controls for cyclical output effects (Flamini, McDonald & Schumacher, 2009) and is expected to affect numerous factors related to supply and demand for loans and deposits. For example, during cyclical upswing, the demand for lending increases and the positive impact on bank profitability is expected. On the other hand, in unfavorable macroeconomic conditions, such as those in the recent crisis, banks may suffer from increasing share of nonperforming loans and consequently deterioration in profits.

Inflation is another important macroeconomic condition which may affect both bank costs and revenues. The extent to which inflation affects profitability depends on whether the inflation is anticipated or not (Athanasoglou, Brissimis & Delis, 2008). Fully anticipated inflation rates mean that bank can timely adjust interest rates in order to raise revenues and eventually bank profits (positive impact). However, in case of unanticipated inflation, bank inappropriately (slowly) adjust its interest rates which results in faster increase of bank costs comparing to revenues and consequently in lower profitability (negative impact).

3. Data, Variables and Methodology

The empirical research is based on the sample that includes 16 banks in the Macedonian banking system in the period from 2005 to 2010. The data are at the annual level. Since the number of time-series observations is the same across the banks, our panel is balanced. Both internal and external determinants of bank profitability are analyzed in a single equation framework. The variables, number of the banks included in the sample and length of analyzed period are determinate by the data availability. Regarding the sources, the data of the bank-specific determinants are collected from the banks financial statements (balance sheet and income statement). The National bank of the Republic of Macedonia provided data on the banking industry concentration variable, while the data of EBRD index of banking reform is collected from EBRD Transition reports (EBRD, 2011). Finally, the data on GDP growth are obtained from World Bank's World development indicators database. Table 1 presents variables, description of the variables and expected signs.

As a dependent variable, in this paper the accounting-based profitability indicator of return on asset (ROA) is used. ROA incorporates the broadest aspect of the banking business as it mirrors the ability of bank management to generate profits from the available bank asset. Moreover, it is considered to be a core performance indicator used in the majority of empirical studies.

Table 1. Variables used in the empirical analysis

Variable	Description	Expected sign
Return on assets - ROA	After tax income / average assets	
Bank size	Ln of total assets	?
Solvency risk	Ratio of equity to total assets	?
Liquidity risk	Ratio of loans to deposits	Positive
Credit risk	Ratio of loans to total assets	?
Fees income	Ratio of income from fees and commissions	Positive
Operating expense management	Ratio of operational costs to assets	Negative
Concentration	Herfindahl Hirschman Index	?
EBRD index	EBRD index of banking sector reform	?
Economic growth	GDP growth rate	Positive

Among bank-specific variables, the first one is bank size. It is measured by natural logarithm of total assets. Ratio of equity to total assets serves as a proxy of bank solvency risk. Liquidity is measured by the ratio of loans to deposits. The next bank-specific variable is credit risk that is calculated as the ratio of loans to total assets. Further, variable fees income is measured as income from fees and commissions over total assets ratio. The last internal variable is operating expenses management. It is expressed by operational costs to total assets ratio.

We include two industry-specific variables in our analysis. The first one is the concentration variable. It is represented by Herfindahl Hirschman Index which is calculated by summing of the squares of the market shares in total deposits of the individual banks. The second one is the banking system reform and it is measured by EBRD index of banking sector reform.

Finally, as macroeconomic determinant of bank profitability we use growth of economic activity that is measured by annual growth rate of GDP.

The analysis of determinants of bank profitability is based on the following model:

$$ROA_{it} = \alpha + \eta ROA_{i,t-1} + \beta X'_{it} + u_{it} \quad (1)$$

where ROA_{it} is the profitability of bank i at time t , with $i = 1, \dots, N$ and $t = 1, \dots, T$. α is a constant term. $ROA_{i,t-1}$ is lagged dependent variable. X'_{it} is set of explanatory variables. β is vector of coefficients to

be estimated. u_{it} are error terms that are assumed to be identically and independently distributed with mean 0 and variance σ_u^2 .

Regarding estimation we use generalized methods of moments (GMM) panel estimator. It is developed for dynamic panel models by Arellano and Bond (1991) and Arellano and Bover (1995). We employ two-step Arellano and Bond GMM estimator.

In order to test validity of the model, two types of tests are performed. The validity of instruments is tested by Sargan test. It is a test of the overidentifying restrictions with null hypothesis that there is no correlation between the instruments and the errors. 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 existence of the first-order serial correlation in the differenced residuals does not imply inconsistency of the estimations. Namely, the condition for consistency of coefficients estimations is that there is no second-order serial correlation in the differenced residuals.

4. Empirical Results

The results of dynamic panel analysis of determinants of bank profitability are presented in Table 2. According to the Sargan test the chosen instruments are valid. The tests of serial correlation in differenced residuals show that there is no first-order or second-order serial correlation.

Table 2. Estimation Results (GMM System Estimator)

Dependent variable: Return on assets	
Explanatory variables	Coefficients (Standard errors) ^a
Constant	0.0014 (0.0040)
Return on assets _(t-1)	0.0470** (0.0255)
Bank size	-0.0215 (0.0141)
Solvency risk	-0.0253*** (0.0083)
Liquidity risk	0.0096*** (0.0021)
Credit risk	-0.0164 (0.0253)
Fees income	0.0025 (0.0492)
Operating expense management	-0.5156*** (0.1213)
Concentration	0.0003*** (0.0001)
EBRD index	0.0526** (0.0285)
GDP growth	0.5573** (0.2693)
Sargan test (p-value)	0.8016
First-order correlation (m ₁) (p-value)	0.1980
Second-order correlation (m ₂) (p-value)	0.7471

^a ***, ** and * indicate significance at the 1, 5 and 10 percent levels respectively.

Source: Authors' calculations.

The variables of ownership (foreign or domestic ownership and privately or government ownership) were excluded from the model. They are expressed as dummy variables and produce inconsistent results. Thus, the more detailed data on the variables are required. Moreover, the set of macroeconomic variables is expanded to include GDP per capita, inflation, interest rates, bank credit to private sector and stock market capitalization. Since they found to be highly collinear with GDP growth, we omitted them from the analysis.

The parameters of bank-specific variables have the expected signs with exception of credit risk which is negative but statistically insignificant. The operating expense management has the most important effect on bank profitability among internal variables. As it is expected it shows negative sign. Operating expenses could be affected by level of the productivity. The low productivity of the banks and high level of the scale inefficiency in the Macedonian banking system is confirmed by Giustiniani and Ross (2008). Further, newly established banks have high costs in the first years of their business. Namely, they are mainly focused on the gaining market share that results in higher expenses. Thus, the banks should focus more on management of these expenses. As the result, the improved efficiency will increase bank profitability.

Besides cost management, improvement of risk management has the importance for bank profitability. Namely, coefficients of both solvency risk and liquidity risk are significant. As the parameter of solvency risk is negative, higher capital to assets ratio implies lower profitability. Thus, although higher level of the bank capital provides safety, over-caution in banking business reduces profitability. The level of the capital should be assessed in accordance with the level of bank risks. Regarding the liquidity the banks with higher ratio of credit to deposits are more profitable. Thus, as bank has more credits in relation to their deposits it means that its sources are more flowed to higher yield assets that should produce more profitability. This implies negative relationship between liquidity and profitability as it is in accordance to the theory.

The size is not important factor of bank profitability in the Republic of Macedonia. The same is true for credit risk as well as fees income. The insignificance of bank size is also found in Goddard, Molyneux & Wilson (2004) and Athanasoglou, Delis & Staikouras (2008). Considering the importance that credit activities have in total banking business, the result of credit risk variable is contrary to our expectation. It seems that profitability of banks in the Republic of Macedonia is more influenced by cost factors, than their lending activities. In order to test the effect which the credit risk has on bank profitability, in more detail, the data on loan loss provisions are needed. As we expected the parameter of the fees income is positive. However, it is insignificant. Thus, bank non-credit activities are not at the level of importance in banking business in the Republic of Macedonia at which they influence the bank profitability.

All analyzed external variables have influence on bank profitability. The most important variable is the growth of economic activity. As it is expected, GDP growth positively and significantly affects bank profitability. Favourable economic conditions in the terms of growing economic activities, means increasing of household savings and demand of enterprises financing. Since non-bank financial institutions in the Macedonian financial system are still undeveloped, household savings dominantly flows to banks. Also, as Macedonian capital market is undeveloped, bank credit is primarily source of enterprise financing. Thus, the growth of economic activities increases the demand for banking services that contributes to bank profitability.

Reforms of banking sector have positive effect on profitability. The average value of the EBRD index of banking system reform in the analyzed period was 2.85 with minimum of 2.7 and maximum of 3. According to EBRD reaching the value of 3 means that there is progress in establishment of bank solvency and prudential supervision and regulation framework, interest rate liberalization, significant crediting of private companies and that privately ownership of banks gets the importance (EBRD, 2011). However, as the index is bringing closer to the value of 4, among other things, it will mean increasing

competition that could negatively affect bank profitability but ensure banking services for the clients at more favorable terms.

Finally, concentration in the banking industry has positive effect on bank profitability. Although with very small value of the concentration variable's coefficient, it implies that SCP hypothesis can be accepted. Thus, in the Macedonian banking system banks can exert their market power, that is charge higher interest rates on credits and pay lower interest rates on deposits. The same result is obtained in Athanasoglou, Delis & Staikouras (2006).

5. Conclusion

This paper analyzed determinants of Macedonian banking sector profitability in the period between 2005 and 2010 using dynamic panel model. According to our results the profitability of the banks is determined by bank-specific, industry-specific and macroeconomic factors.

Since the internal determinants are those that are results of bank policy and management, banks have means to influence them. The most important bank-specific determinant of bank profitability is operating expense management. Thus, there is need to undertake the activities that refer to reducing administrative costs and in that way improvement of the cost efficiency. Among internal factors of bank profitability there are also solvency risk and liquidity risk. This implies the importance for banks to continue the work on development of risk management and capital management. Of particular importance is developing of techniques for risk assessment and, in accordance to it, the assessment of adequate level of bank capital.

Regarding external variables, beside of concentration and banking sector reform, GDP growth has the highest importance. Thus, macroeconomic policies that contribute to the growth would have positive effects on the profitability of the Macedonian banking sector.

In the future work, depending on the availability of more detailed data, the challenge is to broaden the set of explanatory variables, use more adequate proxies for part of the variables and perform the analysis for longer period of time.

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