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PROFITABILITY OF BANKS IN BOSNIA AND HERZEGOVINA: PANEL ANALYSIS

ПРОФИТАБИЛНОСТ БАНАКА БОСНЕ И ХЕРЦЕГОВИНЕ: ПАНЕЛ АНАЛИЗА

Summary: *This paper examines the factors that determine the profitability of the banking sector in Bosnia and Herzegovina, measured by return on assets and net interest margin in the period 2008-2014. As the independent variables we used internal variables specific to the operations of banks, as well as external variables that represent the most important macroeconomic indicators. The analysis showed that the most significant impact of internal variables includes: cost-assets ratio of permanent and total assets, and the scope of the bank. When it comes to macroeconomic variables, inflation shows a significant effect on the movement of profitability of the banking sector in Bosnia and Herzegovina.*

Keywords: *banking sector, profitability, panel analysis, net interest margin, return on assets*

JEL classification: *G21, C33*

Резиме: *Овај рад истражује факторе који детерминишу профитабилност банкарског сектора Босне и Херцеговине мјерену повратом на имовину и нето каматном маржом у периоду 2008-2014. године. Као независне варијабле укључену су интерне, које су специфичне за пословање банака и екстерне варијабле које представљају најзначајније макроекономске индикаторе. Анализа је показала да од интерних варијабли најзначајнији утицај имају однос трошкова и имовине, однос сталне и укупне имовине, те обим банке. Када су у питању макроекономске варијабле инфлација показује значајан утицај на кретање профитабилност банкарског сектора Босне и Херцеговине.*

Кључне ријечи: *банкарски сектор, профитабилност, панел анализа, нето каматна маржа, поврат на имовину*

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1. INTRODUCTION

The stability of the banking sector is an important precondition for the stability of economic development of every country. By doing business in a competitive environment, banks aspire to achieve profitability, which provides them with subsistence on the market in the long term, but it also influences the satisfaction of the owners and shareholders who expect profits from their investment. By observing the structure of the financial sector in Bosnia and Herzegovina, it is easy to notice that banks have the largest share with over 80% share in the total assets of the financial sector, that characterizes its market not only as centered in banks, poor and still underdeveloped as well. This market is also dominated by banks with majority foreign equity share capital, which indicates a lack of ability of local banks to subsist in the market for a long time, and to maintain profitability over a longer period of time. Considering this state of our banking sector, the question is what the determinants that influence the profitability of banks are in the country, to which extent the differences in banking profitability are the result of variations in the internal factors that are controlled by management, and how much the result of external factors influences the performances of the banks.

In this sense, the aim of this paper is to examine the contribution of changes in specific banking factors and macroeconomic variables on changes of profitability of banks in Bosnia and Herzegovina, in the period from 2008 to 2014 by using regression analysis of panel. Following the

existing studies in this field, the analysis includes return on assets and net interest margin as a determinant of bank profitability. The paper is organized in a way that after the introduction, the second part of the paper provides an overview of current research on the profitability of banks. The third part describes the measures of profitability of the banks that were used in the paper, as well as factors that influence the profitability and the fourth part of the paper reviews the research methodology, together with the results. The last part of the paper contains some concluding considerations.

2. LITERATURE REVIEW

Most studies that deal with the profitability of banks, regardless of whether they are panel studies of countries or analysis of banks in individual countries, divide the most common factors of bank profitability into two groups: internal factors that influence the level of specific risks within banks, which are the result of management actions and decisions, and external factors that are related to the macroeconomic indicators and the influence of market concentration, market share, GDP and other macroeconomic variables. The focus among internal determinants is usually on coefficients of return on assets, return on capital, net interest margin and alike. Accordingly, through their study, Huizing and Kunt (1998) suggest that the macroeconomic and regulatory requirements have a significant influence on the movement of interest margins and profitability. A lower ratio of market concentration leads to lower margins and profits, while the effects of foreign ownership in banks vary depending on the degree of development of countries. Specifically, foreign banks have high margins and profits compared to local banks in developing countries, while is the opposite in the developed countries.

Athanasouglu et al. (2006) have studied the profitability of the banking sector of South East Europe for the period from 1998 to 2002, and a key finding of their study is that the effects of market concentration have a significant positive influence on profitability while the macro-economic variables show different degrees of significance, stating that increasing of profitability in these banks demands application of new risk standards and operational efficiency which significantly influence the profitability levels.

Athanasouglu et al. (2005) have applied the dynamic panel model to determine the performances of Greek banks in the period from 1985 to 2001 and have confirmed their profits, which indicates the existence of imperfect competition in the market. The results show that the profitability of Greek banks has been formed by specific banking factors and macro-economic variables that are not directly influenced by management.

Staikouras and Wood (2002) have come to the conclusion that the profitability of European banks is not only influenced by factors related to management decisions, but also by changes in the external macroeconomic environment. The ratio of capital and assets ratio have consistently shown the same level of significance suggesting that banks with bigger levels of capital generate higher profits. On the other hand, the ratio of loans and assets is inversely related to the return on assets (ROA). Also, their results are in contrast to other studies that connect market structure and performances of banks and find positive effects of market concentration variables andor market share in the profitability of banks.

Dietrich and Wanzenried (2009) examined the Swiss banking sector and concluded that better capitalized and highly efficient banks are more profitable, and that the big banks have declining profitability in relation to the medium-sized banks, and foreign banks are less profitable compared to Swiss banks .

Yu and Neus (2005) analyzed a sample of 288 German banks and confirmed that higher rate of market concentration and the size of bank (considered in terms of assets) have a positive effect on the profitability.

On the other hand, Horvath (2009) has shown that market force has no influence on the interest margins of Czech banks and that bigger banks with higher capital adequacy charge lower interest rates, and that interest margins are bigger for banks that have a higher ratio of loans and assets.

Molyneux and Thorton (1992) studied the profitability of banks for instance of a number of European countries and came to the conclusion that there is a significant positive connection between the return on capital (ROE) and interest rates in each country, bank concentration and public property of banks.

In our region, Bach, Posedel and Stojanović (2009) studied the profitability of Croatian banks in the period from 1999 to 2005. and concluded that the profitability primarily depends on the characteristics specific to every bank, and that the growth rate of GDP and the ratio of "non-performing" assets and total assets of the bank have a positive influence on the rate of return on assets. The study has also confirmed a positive and strong influence of net interest margin on banks' profitability, because the interest income is still the largest component of total banking incomes.

3. DETERMINANTS OF PROFITABILITY

Profitability of banks' performance is usually evaluated by the application of the standardized accounting indicators: return on assets, return on capital and net interest margin. Two measures of profitability (ROA) and (NIM) will be used in this papaer for the purpose of our analysis. The rate of profitability of bank assets (ROA) is calculated as the ratio of net income and average total assets and it is determined by the structure of assets and liabilities of the bank and its ability to generate incomes and profits. Although ROA is one of the most commonly used indicators of profitability, and according to many people, it has certain disadvantages, among which is that it does not take into account the bank's risk assets.Therefore, some authors introduce new measures of profitability (RORWA) in their papers, which is the rate of return on the bank's risk assets.

Another measure of profitability that will be used in the paper is the net interest margin (NIM). It is calculated as the quotient of the difference of banking incomes and expenditures on the basis of interests and total assets.This indicator is considered as a good measure of profitability because it shows how much the use of bank's means is efficient. The interest margin depends on the structure of assets and liabilities, the maturity of loans and deposits, and the state of the economy as well. Nowadays, the trend of falling interest margin is present due to competition among banks.

The profitability factors of banks can be divided into two groups: internal and external ones. The following internal parameters as independent variables have been used in this paper: the volume of bank, the ratio of total expenses to total assets, capital adequacy ratio of total loans and assets, the ratio of permanent and total assets.

The assumption is that the bigger market share of a bank positively influences its profitability. Nevertheless, some studies that were made do not give a definite answer to whether the volume of the bank has positive or negative impact on its profitability. Wood (2004) and Kosmidou (2005) suggest that bigger banks use economy of volume and that they can provide services at lower costs and be more efficient than small banks, which leads to their higher profitability. However, Smirlock (1985) came to the conclusion in his paper that banks which are more efficient in their work, compared to other ones, eventually become big and thus achieve bigger participation in the market. The natural logarithm (ln) of the total assets of the bank as a measure of volume of the bank is used in our paper .

The ratio of total costs and total assets should be negatively related to profitability, ie. the growth of this ratio reduces the profitability of bank (it is expected from more efficient banks to do business at a lower cost). Nevertheless, some authors have concluded in their paper that this is not always the case. Bigger profitability may be associated with higher operating costs, especially in less competitive markets, where banks enjoy greater market power due to which they can tumble that part of the increased costs to clients. There are two indicators of the operational (cost) efficiency, that are most commonly used. The first is calculated as the ratio of the total costs of bank and total assets, and the other as the ratio of total operating expenses of the bank and operating incomes. The first indicator of cost efficiency was used in this paper.

Capital adequacy is calculated as the quotient of capital and assets of the bank. The theoretical arguments and empirical evidence provide different results on the influence of the bank's capital structure to its profitability. According to the conventional view of the banking, the higher ratio of capital and assets of banks leads to lower profitability. In this case, the risk associated with capital is reduced, as well as the rate of return on capital required by investors. Hoffman (2011) shows that a higher capital ratio may indicate that banks do business cautiously, but also ignore the potentially profitable business opportunities, that again has a negative influence on profitability. On the other hand, some authors in their paper show that highly capitalized banks face a lower risk of bankruptcy, and less risky sources of assets due to which achieving bigger profitability is certainly expected because of the lower cost of financing these banks .

When we talk about the ratio between total loans and total assets of the bank, it is expected that bank loans are the largest source of income, and that they have a positive influence on bank performances. However, if banks may increase this ratio only by accepting a higher level of risk a drop in profit may be expected..

For banks that in their assets structure have a bigger participation of constant, ie, "non-performing" assets a lower rate of return is expected to be achieved. The assets such as premises, softwares, legally regulated reserves, and the like, do not realize direct incomes to banks but is still a largely necessary prerequisite for performing basic activities of the bank.

Surroundings factors that were used in the paper are: the growth rate of gross national product and inflation. It is expected from the growth of gross national product to have a positive influence on the profitability of bank. Inflation can positively and negatively influence the profitability depending on the bank's ability to manage efficiently the assets of the bank in terms of inflation, and to adequately and timely anticipate future inflation rate.

4. METHODOLOGY AND RESULTS

The study of the determinants of banks' profitability was made on a sample of 24 banks from Bosnia and Herzegovina, for the period from 2008 to 2014. The panel data was used, with a total of 165 observations (only 1.78% is missing). Data source for internal variables are annual reports of banks, that every bank publishes on its website, while the data from the Central Bank of Bosnia and Herzegovina were used for external variables. The panel data means the data set within which the behavior of different entities is observed (observation units) over time. In practice, the following three specifications of models are usually considered:

1) Pooled regression
2) Model with fixed individual effects
3) Model with random individual effects

The general form of a linear regression model panel of data with fixed effects, is as follows (Dragutinovic Mitrovic 2000):

$$Y_{it} = \alpha_i + \beta' X_{it} + u_{it}, \quad i = 1, ..., N; \quad k = 1, ..., K;$$

where is:

Y_{it} - the value of the dependent variable for the i- unit of observation in the period t;
X_{it} - k-value of the independent variable for the i- unit of observation in the period t;

βk_{it} - unknown regression parameters, which are in the general form of panel data model, variable according to observation units and time periods (they are not constant as in the classical regression analysis);

u_{it} - random error with arithmetic value equal to zero (E (u_{it}) = 0) and constant mutual variance (E (u_{it}^2) = σ_u^2) for every and i and t)

To choose the appropriate form of the model that will best show the observed data Hausman's test was used. If we accept the null hypothesis of the test, then it is concluded that the model with random effects is appropriate, while rejecting of the null hypothesis leads to the conclusion that the model with fixed effects is appropriate.

The empirical results of panel analysis are shown in table 1.

Table 1 The results of multiple linear regression model

INDEPENDANT VARIABLES	DEPENDANT VARIABLES	
	ROA	NIM
Constant	-0,045115 (0,079453)	-0,111758 (0,054224)
Capital adequacy	-0,000450 (0,007742)	-0,006641 (0,006102)
The ratio of costs and assets of the bank	-0,708027 (0,048451)	0,074424 (0,037144)
The ratio of loans and the bank's assets	0,003032 (0,002992)	-0,000351 (0,002348)
The ratio of permanent and total assets	0,203849 (0,089828)	0,025945 (0,067425)
The volume of the bank	0,006873 (0,005767)	0,011724 (0,003891)
The rate of GDP	-0,000942 (0,000610)	-0,000443 (0,000480)
Inflation	0,001737 (0,000596)	0,001013 (0,000480)
Number of observations	165	165
R^2	0,779	0,9563
Hausman's test	30,150647	0,00000
p value	0,00000	1,0000
F test	15,30278	2,107778
P value	0,00000	0,04567

Source: Calculations of the authors

From the table above it can be seen that in the case when a variable is dependant the return on assets is evaluated model with fixed individual effects, while the net interest margin is evaluated model with fixed effects as a visible result of Hausman's test. The coefficient of determination is high, and the significance of the F statistics indicates that the variations of chosen dependent variables by the unit of observation are the result of the variations of chosen independent variables.

The rate of return on assets is influenced by three variables: the ratio of costs and assets (statistically significant at 1%). Relation of permanent and total assets (statistically significant at 1%) and inflation (statistically significant at 1%). The ratio of costs and assets has a negative sign which is in accordance with most of the previous studies. Ratio of variables and permanent and total assets and inflation have a positive sign. It was expected that the ratio of permanent and total assets has a negative sign because it is non-performing assets.

Net interest margin is also influenced by three variables, which are: the ratio of costs and assets (statistically significant at 1%), the volume of bank (statistically significant at 1%) and inflation (statistically significant at 1%). All indicators have a positive influence on the movement of net interest margin. The positive influence of the ratio of costs and assets on net interest margin can be explained by the fact that banks tumble increased interest costs on clients by increasing fees. The volume of the bank has influence on net interest margin, while the influence of this variable on the returns on assets is not significant. This can be explained by the fact that bigger banks have a much more significant share in the loan portfolio of the banking sector, and realize higher net interest incomes.

Although numerous analyzes have shown a positive connection between performance and capital adequacy of banks, this ratio has not been confirmed in this paper. This may be the result of bank recapitalization and big losses that banks showed in the financial reports.

A significant inflation was proved from the macroeconomic variables in both models. Namely, relatively stable inflation and deflation, characteristic for the observed period influenced the expectations of consumers which still led to increased credit activities of banks. The stable inflation has neither realized the profit, so that the real term of the profit increased. The agreement between the observed inflation and profitability indicators ROA can be viewed from the angle of impact of credit expansion on aggregate demand with a special emphasis on the transmission of aggregate demand on the movement of the general price levels.

4. CONCLUSION

The paper analyzes the determinants of bank profitability of Bosnia and Herzegovina in the period from 2008 to 2014, using the panel models. The determinants of profitability include internal variables that are specific to the banks and on which the bank management has a significant influence as well as external macroeconomic variables, while the return on assets and net interest margin were used as indicators of profitability.

When it comes to internal variables, ratio of fixed assetsand the ratio of the total costs of the assets proved to be significant. The analysis showed that bigger banks are more profitable in the short term, speciofically those banks that manage effectively their costs. Furthermore, the analysis showed that banks with higher share of non-performing assets have higher return on assets, which is explained by the fact that banks are increasingly directed towards non-traditional banking services, and tumble the higher costs on clients through higher fees and higher loans costs.

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