An Examination of the Net Interest Margin Aas Determinants of Banks' Profitability in the Kosovo Banking System

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Abstract:

The purpose of this working paper is to investigate determinants of banking system profitability in Kosovo by using times series data aggregating for all banking system from year 2006 to 2013, in quarterly basis in total 32 observations. The study used quantitative research approach and secondary data and is analyzed by using linear regression model of the three bank profitability measures: Return on Assets (ROA), Return on Equity (ROE) and Net Interest Margin (NIM). Linear regression model was applied to investigate the impact of capital adequacy ratio, total loans to total assets ratio, provision from loan losses to net interest income ratio, non interest income to total income ratio, managerial efficiency ratio. The descriptive statistics for profitability measures for all variables have positive value. The empirical result shows that the ratio that we mentioned above has a strong influence on the profitability of Kosovo Banking System.

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Key words: Profitability, Determinants, Industry specific variables, Time series

Introduction

The analysis of the main factors that impact on bank profitability has drawn the attention of the decision and policy makers and of the researchers as the banking system is one of the important for developing a national economy and establishing financial stability. However, the serious implications of the recent international financial crisis on the banking system bring back to the center of attention the evaluation of bank profitability determinants. Banks' profitability is given attention during sub-prime mortgage crisis that happened in 2007-2009, the banking sector of many countries suffer with high losses, especially U.S and European Union Countries. The poor performance of the banking industry has slowed down the economy and also the growth of global economy during this period. In Kosovo, although the losses in banking system were not a serious as U.S and European countries, but it is also reflecting into the economy. In Kosovo, the financial system is focused on commercial banks, which have a main role in financing the real economy and ensuring the financial stability. If the banking industry does not offer the sound and safe stability, the effect to the economy could have a negative impact. Because, banks are the critical part of financial system, play a pivotal role in contributing to a country's economic development (Rasidah and Mohd, 2011). In this context, ensuring a healthy, stable and highly effective banking system is of major importance to deal with long term economic growth and financial stability.

In the latest years, this preceded the current world economic crisis, amid significant structural, institutional and legislative transformations; the Kosovo banking sector has

registered growth in the low level, with major impact upon bank profitability and efficiency. Following a high level on loan disbursement, short-term investment on government securities, diversity of banking operations, a range of banking products and services, the banks have recorded a growing income, with positive and significant impact upon the profitability indicators. Our paper is based on the studies of (Dietrich and Wanzenreid, 2010); (Naceur, 2003) adopted for the Kosovo banking system. Based on these studies and other related studies focused on bank profitability determinants, we used econometric model based on an analysis of linear regression that allow to investigate the relationship between bank profitability and some internal determinants. Apart from the introduction, this paper is divided into four other sections: literature review, methodology and findings and the last section concluding remarks.

Literature Review

The analysis of the literature emphasized the existence of a significant number of theoretical and empirical studies focused on investigating the factors that impact the bank profitability. The majority of studies on bank profitability, such as Short (1979), Bourke (1989), Molyneux and Thornton (1992), Demirguc-Kunt and Huizinga (2000) and Goddard et al. (2004), used regression models to estimate the impact of various factors that may be important in explaining profits. Based on the findings of these and other related studies, company level determinants of banks' profitability can be identified easy.

In general, in all of these studies conducted by different authors are included variables almost the same with minor changes, by applying in some studies both internal and external variables and in some studies only internal variables. (Neucer, 2003) evaluates the influence of banks' characteristics, financial structure of banks' and macroeconomic indicators on banks' net

interest margins and profitability for a sample of ten deposit banks from Tunisia, for the period from 1980 to 2000. The result of this studies show that a high net interest margin and profitability are associated to the banks that possess the level o capital. Considering the effect of the macroeconomic indicators, the result from these studies shows that the inflation rate and the economic growth rate have impact upon banks' interest margins and profitability. Regarding to the impact of financial structure indictors, the results of the empirical analysis show that the stock market development has a positive effect upon the bank profitability.

Preoccupied about the banking performance determinants, (Athanasoglou et al, 2006) during their study analyze the impact of banks' specific indicators, banking industry and macroeconomic variables on bank profitability in seven countries South Eastern European Region, for the period of 1998 to 2003. Empirical results show except, for liquidity, all other banks determinants significantly have effect on banks' profitability. The study also emphasizes that changes over by the structure of the banking sector and macroeconomic environment has a direct impact on bank performance. According to the study realized by (Staikouras et al, 2007) were analyzed relationship between operational performance of bank, market and country specific characteristics, with the same countries and data realized by the (Athanasoglou et al, 2006). The empirical results show that, for the analyzed period, operating expenses were decreased in all banking industry in the sample, except those from the Macedonia, Serbia and Montenegro, which in average show the banks have improved their operating performance.

The major negative implications of the financial crisis 2007-2008 upon the financial institutions made by (Deietrich and Wanzenreid, 2010) focus of their investigating has been on the main determinants of the profitability for the Swiss banking industry. In empirical analyze were employed data

from 453 commercial banks in Switzerland for the period from 1999 to 2008. The result from these studies show that banks which are well capitalized are more profitable, on other side regarding crisis impact, the authors bring out that the cost income ratio (efficiency ratio) had a significant impact on the return profitability on assets and equity ratio, but after crisis the negative impact on profitability have provision for loan losses which is related to total loans.

The literature review reflects the existence of some weaknesses in knowing the determining factors of the bank profitability for the banks that operate in Kosovo, the existence of a relatively reduced number of studies being noticed in our country, especially of the recent time. Thus, our working paper will contribute to the literature providing empirical evidence regarding some key factors that influence the profitability of the commercial banks from Kosovo.

Data and Methodology

In general, there are a several types of data that are appropriate when we are dealing with a quantitative analysis to solve financial problems, the most important are: time series data, panel data and cross-sectional data. Time series data are those data which are collected in one or more variables for a long period of time. The data that are used in our empirical analysis were collected from relevant institutions, published quarterly by the Central Bank of Kosovo, in the aggregate for the entire banking system and these data are published according to the format established by the International Monetary Fund (IMF). Period which is included within this paper is from December 2006 to December 2013, which is in total 32 observations. In the context of our analysis we determined dependent variable and independent variable which will be tested in the econometric model. The dependent variable is ***Net interest margin (NIM)***, and independent selected

variables are: *capital ratio, liquid ratio, loan to deposit ratio, provision for loan losses to total net income, non interest income to total income ratio and efficiency ratio.*

Our paper uses time series data due to the advantage that it has, and it helps to analyze the behavior of each bank over time (Baltagi, 2005); (Gurajati, 2003). Linear regression model was issued to determine the relative importance of each independent (explanatory) variable in affecting the performance of bank. The general linear regression model is:

$$y = \beta_0 + \beta_1 x + \varepsilon$$

Starting from the general model and taking into account the selected variables, the empirical model used in our study is:

$$NIM_t = C + \beta_1 CR + \beta_2 LR_t + \beta_3 LDR_t + \beta_4 PLLTNIR_t + NIITIR_t + ER_t \, \varepsilon$$

Where:

NIM = net interest margin ratio of banking system in period t

CR_t = capital ratio of banking system in period t

LR_t = liquid ratio of banking system in period t

LDR_t = loans to deposit ratio of banking system in period t

$PLLTNIR_t$
= provision for loan losses to total net income ratio of banking system in period t

$NIITIR_t$
= non interest income to total income ratio of banking system in period t

ER_t = eficciency ratio of banking system in period t

ε = eror term of the model t

where t= 2006-2013, C = is constant term

Table 1 Descriptive statistics of the model variables

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
NIM	32	.0116	.0641	.034584	.0157068
CR	32	.0606	.0835	.071803	.0056240
LR	32	.1686	.3258	.237350	.0411041
LDR	32	.6685	.8620	.776844	.0477722
PLLTNIR	32	.1628	1.1875	.285850	.1765528

NIITIR	32	.1765	.2484	.200931	.0176471
ER	32	.6047	.8519	.710834	.0609420
Valid N (list wise)	32				

Sources: Author's calculations

Table 1 shows descriptive statistics with number of observation, minimum, maximum, mean value and standard deviation for the total period of data. As it can be seen from the table above, Net interest margin ratio has mean value of .034 or 3.4 percent which is ranked as a moderate average. The standard deviation is .016 or 1.6 percent which is not far from mean average and show moderate variability. Capital ratio has the lowest mean value of .072 or 7.2 percent, which shows moderate variability, and the moderate standard deviation of .006 or 0.6 percent. This shows that the data are consistent because the standard deviation value is not much far from the mean value. Liquid ratio has mean value of .237 or 23.7 percent. The minimum and maximum value is .169, respectively .326 (16.9 percent respectively 32.6 percent) which shows that banking system of Kosovo is liquid. Loan to deposit ratio has a mean value .778 or 77.8 percent with standard deviation of .0477 or 4.7 percent. These result shows that banking system in Kosovo is using their funds in a satisfied level for providing loan to their costumer, which reflect with a higher interest income. Provision for loan losses to total net income has a mean value of .286 or 28.6 percent of total net income, with standard deviation of .176 or 17.6%. Non-interest income to total income has a mean value of .201 or 20.1% of total income, with standard deviation of 0.176 or 1.7 percent. According to these we can conclude that non-interest income contribute to total income in average of 20.1% of total income.

The ratio with the high mean value is efficiency ratio *(which is ratio between operating cost and operating income)* of .710 or 71.1 percent with the largest variability. Whereas, the maximum and minimum value of .852 and .604 respectively. The NIM reflects the ability of banks' management to generate

profits from the banks' assets and this profitability measure is correlated with other explanatory variables either positively or negatively. In table 2 below, the correlation analysis is undertaken between profitability measures: net interest margin and explanatory variables: capital ratio, liquid ratio, loan to deposit ratio, provision for loan losses to total net income ratio, non-interest income to total income ratio and efficiency ratio.

Table 2 Correlation matrix: Net interest margin

|	NIM	CR	LR	LDR	PLLTNIR	NIITIR	ER
NIM	1						
CR	.108	1					
LR	-.048	-.454**	1				
LDR	-.128	.623**	-.483**	1			
PLLTNIR	-.295	-.455**	.330*	-.362*	1		
NIITIR	.334*	.093	-.166	-.242	.052	1	
ER	-.074	-.538**	.177	-.672**	.354*	.325*	1

*Correlation is significant at the 0.05 level (1-tailed)
* Correlation is significant at the 0.01 level (1-tailed)
Sources: Author's calculations

As we can see in table above, the correlation coefficient between net interest margin and capital ratio is .108 which is the smallest positive coefficient as a compared to other variables, this mean that private commercial banks capital ratio has a small association with profitability which supports argument that banks have a weak lending practices. But the highest positive correlation has non-interest income to total net income which is .334.

This result shows that managerial efficiency of private commercial banks measured by the ratio have a significant relationship with the profitability measured by net interest margin. From the correlation matrix we can see that provision for loan losses to total net income ratio have a strong negative correlation which is -.295.
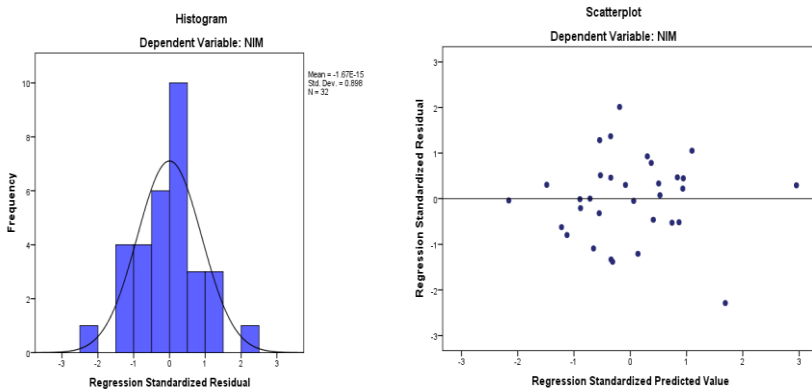
Figure 1 Heteroscedasticity and Histogram of the model

Sources: Authors calculations

The graphics show the data distributions are normally of dependent variables with frequencies including the regression model. Scatter plot graph show that there are no systematic relationship between regression standardized residual of dependent variable net interest margin and regression standardized predicted value. According to (Wooldridge, 2009) that is enough evidence for heteroscedasticity. To examine the relationship between profitability measures and explanatory variables we run linear regression model. In the following table coefficients, we present R, R square, Adjusted R square and standard error.

Table 3 Linear regression Model Summary for net interest margin and explanatory variables

Model Summary				
Model	R	R Square	Adjusted R Square	Standard Error of the Estimate
1	.544a	.296	.126	.0146802

a. Predictors: (Constant), ER, LR, NIITIR, PLLTNIR, CR, LDR

Source: Authors calculations

The results from the model show that dependent variable has a strong correlation with explanatory R in level of .544, R square

of .296, which shows 29.6 percent of dependent variable is explained from independent variables.

Table 4 Linear regression ANOVA results

ANOVA[a]					
Model	Sum of Squares	difference	Mean Square	F	Sig.
Regression	.002	6	.000	1.748	.051[b]
Residual	.005	25	.000		
Total	.008	31			

a. Dependent Variable: NIM
b. Predictors: (Constant), ER, LR, NIITIR, PLLTNIR, CR, LDR
Sources: Author's calculations

Before starting to comment the results we will give some interpretation of diagnostic test results. F-test is equal .051 which shows that all coefficients are statistically significant and different from *zero*. Whereas, collinearity statistics show that VIF factor with the higher value of regression coefficient is LDR in value of 2.839, all variables are smaller than ten (VIF<10), which mean that multicollinearity of data on regression are proper. Different empirical studies about multicollinearity give different arguments. Mahorta (2007) stated that multicollinearity problems exist if correlation coefficients between variables are more then 0.75.

Table 5 Linear regression coefficients

Coefficients[a]							
Model	Un standardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	.143	.122		1.168	.254		
CR	-.093	.694	-.033	-.1350	.894	.456	2.194
LR	-.003	.082	-.009	-.0410	.967	.618	1.618
LDR	-.123	.093	-.375	-1.327	.197	.352	2.839
PLLTNIR	-.030	.017	-.341	-1.756	.091	.748	1.338
NIITIR	.333	.176	.374	1.894	.070	.724	1.381
ER	-.089	.065	-.344	-1.371	.182	.449	2.228

a. Dependent Variable: NIM

Sources: Author's calculations

From the table presented above, in contrast to the hypothesis, four explanatory variables, capital adequacy ratio, liquid ratio, loan to deposit ratio, provision for loan losses to total net income ratio and efficiency ratio have a negative relationship with net interest margin ratio, with coefficient of-.093, -.003, -.123, -.030 and -.089 respectively. This means that any increase in capital position, a higher level of non-performing loans, and having more liquid assets leads to lower profitability. Net interest margin is negatively related to capital adequacy and the result is consistent with the findings of (Nguyen, 2006). The positive relationship has only non-interest income to total income ratio with coefficient of .333. The coefficient of the capital ratio is negative related to net interest margin, expressing a direct relationship with the banks' profitability, in opposite to the results of (Goddard at al, 2004); (Athanasoglou et al, 2008); (Dietrich and Wanzenreid, 2010); and (Trujillo and Ponce, 2013). In our case liquid ratio result is negatively correlated to the banks' profitability. This shows that an increase of the banks' liquidity leads towards a decrease of the profitability.

Loans to deposits ratio in our model results show negative correlations with net interest margin. It means the decrease of loan to deposit ratio will decrease banks' interest income, respectively banks' profitability. The regression result presented in table nr.5 shows, that provision for loan losses to total net income ratio (PLLTNIR) is statistically significant in level of 90% with negative impact (P=.091). These result shows that increase of PLLTNIR have a negative impact on net interest margin ratio. Empirical analysis for non-interest income to total income ratio (NIITIR) shows that there is a positive relationship with net interest margin ratio with significant level of 90% or (P=.070). Efficiency ratio result doesn't have any significant with dependent variable net

interest margin, correlated negative coefficient is -.089, which is a ratio of operational cost to operational income. The study found that an increase of 1 % of operational cost will impact in 2.22% decrease banks' profitability, respectively net interest margin. This result is similar with (Nguyen, 2006) findings.

Conclusion:

In this working paper we investigated empirically the main factors which have positive or negative impact on net interest margin. The data used in this model were with time series for period of 2006-2013, or 32 quarterly observations. With regard to secondary data analysis based on the aggregated financial statement of banking system of Kosovo, we applied the regression model for banks' profitability, respectively ratio of net interest margin (NIM).

The major findings of the working paper analysis are presented as follows:

- First of all, the study found out that indeed the banking system in Kosovo has been experiencing profitability during these years of global financial crisis in spite of many challenges facing financial institutions around the world. The working paper also observed that there is a difference between variables which have positive and negative impact on profitability.
- The empirical analysis give evidence that capital to asset ratio is negative related to banks' profitability.
- Empirical results of this working paper, found out that ratio of non-interest income to total income (NIITIR), have a significant effect on profitability. The result of the study has indicated that excessive concentration of the banking system on non-interest income generating services which are very expensive to intense competition than the traditional income activities has actually minimize the profitability over the last decade

which includes the recent years of global financial crisis.

- According to the regression model, provision for loan losses to total net income ratio (PLLTNIR), is statistically significant in level of 10%, with negative correlation. The study found that commercial banks and regulatory authority should be more attentive and careful in selecting clients to support with loans. Because, the failure to return the loan by the contracting term, commercial banks are obliged to divide provision for loan losses, and this provision has a direct impact on profitability.

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