

THE DETERMINANTS OF THE CAPITAL ADEQUACY RATIO IN THE ALBANIAN BANKING SYSTEM DURING 2007 - 2014

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Abstract

The Albanian banking system has undergone to a radical transformation especially the last 23 years taking into account that in 1992 were operating only 3 state owned banks while in 2014 we have 16 private banks. In the same time is to notice that the Albanian banking system occupies almost 85% of the financial system showing the weak role of the capital markets. Aim of this paper is to analyze the main banking determinants of the capital adequacy ratio in the Albanian banking system after the global financial crises. In this study we use a regression model like the ordinary least squares analysis to test the relationship between the dependant and independent variables using quarterly data from the first trimester of 2007 until third trimester of 2014 with a total of 31 observations. As dependant variable we use the capital adequacy ratio (CAR) while as independent variables we use: return on assets (ROA), return on equity (ROE), the non performing loans (NPL) and bank size (Total Assets), equity multiplier (EM) and loan to deposit ratio (LTD). From the result we find out that profitability indicators such as ROA and ROE do not have any influence on CAR while NPL, LTD and EM have negative and significant impact on CAR in the Albanian banking system. The bank size has a positive impact on CAR meaning that large banks have higher CAR.

Keywords: Banking system, capital adequacy ratio, profitability indicators, bank size

INTRODUCTION

In the Albanian banking system banks calculate the capital adequacy ratio dividing the regulatory capital by the total risk weighted assets and is expressed in percentage. Banks insure that capital adequacy ratio should not be lower than 12%. The Albanian banking system actually is well capitalized having a capital adequacy ratio of 17.58% far by its obligatory level of 12%. Despite the problems the banks are facing after the global financial crises we can say that in the Albanian banking system the capital adequacy ratio remains stable with an average of 16.60% the last 8 years.

Actually in Albania has not started yet the implementation of Basel II nevertheless the bank of Albania as a result of a series of agreements it has with several Eurozone's banks, now and then implements certain rules of Basel II if they fully adapt to the conditions of our country's banking system. In fact as a result of some frequent collaborations and agreements with bank of Italy in July of 2013, the bank of Albania has approved the new regulation on capital adequacy ratio. The object of this regulation is to set out the rules for calculating capital adequacy ratio and determining the minimum capital adequacy ratio. This new regulation is expected to enter into force in the end of 2014 and is based on the first pillar of Basel II agreement. According to the new regulation banks calculate the capital adequacy ratio as the ratio between the amount of regulatory capital to the amount of risk-weighted exposures and this ratio should not be lower than 12%. In fact this ratio (12 %) is bigger if compared with Basel II (8 %) showing that countries like Albania should be more prudent in the determination of the capital adequacy ratio (CAR).

LITERATURE REVIEW

The relationship between the capital adequacy ratio and macroeconomic and banking factors is very important taking into account that the bank capital serves as cushion in case the value of the bank's assets declines or its liabilities rise. There are a lot of academics and other financial institutions that have tried to investigate the main factors that determine the capital adequacy ratio. Below we give a short literature review of some authors who have studied the relationship between capital adequacy ratio and some internal and external factors.

Harley Tega Williams (2011) study the relationship between capital base and some macroeconomic, financial structure and banking variables using an error correction model during 1980 – 2008 in Nigeria. As dependent variable the author uses capital adequacy base while as independent variables are used: total loans, money supply, interest rate, inflation rate, demand deposit, political instability, exchange rate, liquidity risk, openness of the economy and investments. The author concludes that the money supply is a very important determinant of the

capital adequacy base in Nigeria having a high and very strong level of significance. The real interest rate is negatively related to capital adequacy base meaning that an increase of real interest rate dampen the capital adequacy base. The real exchange rate is a significant determinant but its coefficient is not as expected while the deposit liabilities and liquidity risk are not statistically significant. The author finds out that investments and political instability are correctly signed and statistically significant to explain the capital adequacy base in Nigeria.

Yuanjua and Xiao Shishun (2012) analyze the relationship between the capital adequacy ratio (CAR) and some internal banking variables using regression analysis from 2005-2010. They use capital adequacy ratio as dependant variable while as independent variable they use: ROA, ROE, EPS, deposit loan ratio (DLR) and NPL. From the regression results the authors find a positive relationship between ROA and CAR but a negative relationship between ROE and CAR. In the same time is noticed a negative relationship between CAR and credit risk (NPL) and also liquidity risk (LDR).

Ahmet Büyükkşalvarcı and Hasan Abdioğlu (2011) investigate the determinants of the capital adequacy ratio (CAR) in the Turkish banks using data from annual reports during 2006 – 2011 for 120 observations using secondary data. The capital adequacy ratio is used as dependant variable while as independent variables are use indicators that measure: banks size, deposits, loans, loan loss reserves, liquidity, profitability, net interest margin and leverage. From the regression results the authors find that loans, loans loss reserves, leverage, ROA and ROE have a significant relationship with CAR while bank size, deposits, liquidity and net interest margin do not have effect on the CAR in the Turkish banks.

Ahmad Aref Almazari (2013) on his research focuses his attention on the relationship between capital adequacy ratio and the profitability of the commercial Saudi Arab Banks. The author measures efficiency with the Capital Adequacy Ratio (CAR) and the Cost income Ratio (CIR) while the profitability is measured by ROA and ROE. Studies have revealed that there is a positive relationship between capital adequacy and profitability, while the relationship between cost income ratio and profitability is negative. The author also finds a positive relationship between banks size and profitability. In this study the authors find a negative relationship between capital indicators and profitability in the Saudi banks.

Leila Bateni, Hamidreza Vakilifard & Farshid Asghari (2014) study the relationship between capital adequacy ratio and bank size, loan to asset ratio, ROE, ROA, equity ratio, deposit asset ratio and risk asset ratio using data from six private Iranian banks during 2006 – 2012 with a total of 41 observations for each variable. From the regression results is noticed that the independent variables explain 71.15% of the variation of the dependent variable (CAR). First of all is to emphasize that risk asset ratio (RAR) and deposit asset ratio (DAR) do not have

any impact on capital adequacy ratio. Bank size has a negative relationship with CAR while loan to asset ratio (LAR), equity ratio (EQR) and ROA have a positive and significant relationship with CAR.

METHODOLOGY

In this paper we use a regression model like the ordinary least squares analysis in order to test the relationship between capital adequacy ratio and the independent variables. We consider a period from the first trimester of 2007 until the third trimester of 2014 with a total of 31 observations.

As dependant variable we use capital adequacy ratio (CAR) while as independent variables we take:

- ❖ Return on Equity (ROE);
- ❖ Return on Assets (ROA);
- ❖ Nonperforming loans (NPL);
- ❖ Loans to deposit ratio (LTD)
- ❖ Equity multiplier (EM).
- ❖ Natural Logarithm of Total Assets (Ln_TA)

The *ROE* and *ROA* are the main performance indicators and are used as proxies for profitability. According to previous studies is noticed a positive relationship between capital adequacy ratio and profitability indicators. In fact a bank that performs well can rise up capital from the retained earnings.

H1. Profitability indicators have no statistically significant impact on capital adequacy ratio in the Albanian banking system.

The *NPL* ratio is determined as the ratio between non performing loans to total loans and usually is used as a proxy of the credit risk. In the Albanian banking system a non performing loan is considered a loan that presents delays in principal and interest payment for more than 90 days. The expected relationship between the *NPL* ratio and capital adequacy ratio is expected to be negative, showing that banks which have a high capital level are expected to have a lower *NPL* ratio as a result of the coverage of the loan losses by its equity.

H2. The NPL ratio has no statistically significant impact on capital adequacy ratio in the Albanian banking system

The loan to deposit ratio (*LTD*) is used to assess a bank's liquidity indicator and is determined dividing the banks total loans by its total deposits. The relationship between LTD and capital adequacy ratio is expected to be positive because a high level of LTD means a higher liquidity risk that should be compensated by a higher level of capital. In the same time a high level of LTD means higher profits which can be added as retained earnings to the level of capital and as a result have higher capital levels. From above in this context we expect a positive relationship between LTD and capital adequacy ratio.

H3. The LTD ratio has no statistically significant impact on capital adequacy ratio in the Albanian banking system.

The *equity multiplier (EM)* measures the financial leverage of the bank and is calculated by dividing its total assets by stockholder's equity. The relationship between EM and capital adequacy ratio is expected to be negative because if we increase the EM we have to expect a lower capital adequacy ratio.

H4. The equity multiplier (EM) has no statistically significant impact on capital adequacy ratio in the Albanian banking system.

The *total assets (Ln_TA)* are used as a proxy of the banks size. In fact the relationship between banks size and capital adequacy ratio may be positive or negative. For example *Leila Bateni, Hamidreza Vakilifard & Farshid Asghari (2014)* find a negative relationship between bank size and capital adequacy ratio for Iranian private banks. In the same time according to *Jackson (2002)* banks with large dimensions tend to have excess of capital reserves in order to maintain their good rating. In this context we expect a positive or negative relationship between capital adequacy ratio and bank size measured by the natural logarithm of the total assets.

H5. The bank size has no statistically significant impact on capital adequacy ratio in the Albanian banking system.

ECONOMETRIC MODEL TESTING AND REGRESSION RESULTS

The relationship between the dependent variables (CAR) and the independent variables will be tested by a linear regression analysis called ordinary least squares (OLS).

In table 1 is given a descriptive analysis of the factors that are taken into consideration in this paper. The dependant variable (CAR) has a mean of 16.60% during the period of the study which is higher than the regulatory level of 12% imposed by the supervising authorities. Analyzing the profitability of the Albanian banking system is noticed that ROA and ROE after the global financial crises are reduced compared to pre-crises results showing a deterioration of the

banking performance. Another important indicator we consider is NPL ratio which is used as a proxy of the credit risk of the Albanian banking system.

Table 1. Descriptive Statistic

Variable	Minimum	Maximum	Mean	Std. Deviation
CAR	0.1464	0.1807	0.1660	0.0096
ROA	-0.0174	0.0217	0.0012	0.0083
ROE	-0.0728	0.1761	0.0485	0.0612
NPL	0.0242	0.2498	0.1375	0.0820
LTD	0.3818	0.6468	0.5537	0.0636
EM	7.7438	13.3386	9.4598	1.4389
LnTA	27.1929	30.4711	27.6707	0.5609

The NPL ratio after the global financial crises has suffered a progressive increase going from about 3% (2007) to 25% (2014) recently showing a very high credit risk of the Albanian banking system. The average of LTD ratio is 55.37%, showing that the bank's loan is 55.37 cents for every monetary unit of deposits.

Table 2. Correlation Matrix

Variables	CAR	ROA	ROE	NPL	L/D	EM	LnA
CAR	1.0000	0.2044	0.2671	-0.3459	-0.4568	0.1321	0.0531
ROA	0.2044	1.0000	0.7702	0.0693	-0.4934	-0.0134	0.4099
ROE	0.2671	0.7702	1.0000	-0.3069	-0.6756	0.3799	0.0290
NPL	-0.3459	0.0693	-0.3069	1.0000	0.3974	-0.7452	0.5439
LTD	-0.4568	-0.4934	-0.6756	0.3974	1.0000	-0.5961	0.1238
EM	0.1321	-0.0134	0.3799	-0.7452	-0.5961	1.0000	-0.5235
LnTA	0.0531	0.4099	0.0290	0.5439	0.1238	-0.5235	1.0000

This ratio is not very high if compared to European banks (115%) while is almost the same with the American banks (72%). As a result we can assume that Albanian banking system has still potential capacities to grant new loans and remain under the world's averages of LTD ratios. After analyzing the data with Microfit 5.0 software we have the regression results as follows (table 3):

- The regression analysis confirms that the coefficient of determination, R-Squared, is equal to 67.20% and shows that the independent variables explain 67.20% of the variation of the CAR in the Albanian banking system, while the remaining part (32.80%) is explained by other factors that are not included in this study.

- The DW – statistic is equal to 1.83 indicating that the residuals are not correlated having a value approximately to 2.
- The indicator of F-Statistic shows that the observed value (16.21) is greater than its critical value (3.41) so the alternative hypothesis wins and the model is globally significant.
- The VIF (variance inflation factor) indicator is used to measure if there is multicollinearity in a regression analysis. From the results is noticed that all variables have VIF values lower than 5, showing an absence of the multicollinearity in the regression analysis.

Table 3. Regression Results*

Variables	Beta Coef.	t-value	p-value
Constant	0.1706	1.5769	0.1279
ROA	-0.1983	-0.5406	0.5937
ROE	-0.0102	-0.2055	0.8389
NPL	-0.0816	-2.9153	0.0076
LTD	-0.1125	-3.0329	0.0057
EM	-0.0046	-2.428	0.0231
LnTA	0.0410	2.7891	0.0135

*Dependant variable Capital Adequacy Ratio

Analyzing the results of table 3 we derive the econometric model that explains the dependent variable (CAR) and is shown as follows:

$$\text{CARI}_{i,t} = 0.01706 - 0.1983\text{ROAi}_{i,t} - 0.012\text{ROEi}_{i,t} - 0.0816\text{NPLi}_{i,t} - 0.1125\text{LTDi}_{i,t} - 0.0046\text{EMi}_{i,t} + 0.0410\text{LnTAi}_{i,t}$$

To analyze the relation and statistical significance of Beta coefficients of the independent variables we review the values of the probability p. For p-values (*observed level of significance*) greater of 0.05 the influence of the independent variable on the dependent variable is unimportant when the other variables remain unchanged while for p-values smaller than 0.05 we refuse the hypothesis of the absence of relationship.

Hypothesis #1. Beta coefficients of ROA and ROE are negative (-0.1983 & -0.0102), showing a negative relationship between bank's profitability and CAR. P-values are 0.5937 and 8389 that are greater than 0.05 showing that the profitability indicators in the Albanian banking system have no impact on capital adequacy ratio. This means that contrary to previous studies in the Albanian banking system there is no relationship between profitability indicators and capital adequacy ratio.

Hypothesis #2. Beta coefficient of NPL ratio is negative -0.0816, showing a negative relationship between NPL ratio and CAR. P-value is 0.0076 that is smaller than 0.05 and in this case we can say that the NPL ratio has a statistically significant impact on the CAR. The negative sign of beta coefficient shows that the increase of NPL ratio determines the reduction CAR in Albanian banking system. This conclusion is in line with other studies in this field showing that a higher NPL ratio leads to lower CAR.

Hypothesis #3. Beta coefficient of LTD ratio is negative -0.1125, showing a negative relationship between LTD ratio and CAR. P-value is 0.0057 that is smaller than 0.05 and in this case we can say that the LTD ratio has a statistically significant impact on the CAR. The negative sign of beta coefficient shows that the increase of LTD ratio determines the reduction CAR in Albanian banking system. This conclusion is in contrast with other studies in this field showing that a higher LTD ratios leads to higher CAR.

Hypothesis #4. Beta coefficient of EM is negative -0.0046, showing a negative relationship between EM and CAR. P-value is 0.0231 that is smaller than 0.05 and in this case we can say that the EM has a statistically significant impact on the CAR. The negative sign of beta coefficient shows that the increase of EM determines a reduction of CAR in the Albanian banking system. In fact a higher EM, if it comes from an expansion of bank's activity will certainly lead to lower CAR.

Hypothesis #5. Beta coefficient of bank size (LnTA) is positive 0.041, showing a positive relationship between bank size and CAR. P-value is 0.0135 that is smaller than 0.05 and in this case we can say that the bank size has a statistically significant impact on the CAR. The positive sign of beta coefficient shows that an increase of bank size in terms of its assets determines an increase of CAR in the Albanian banking system. This conclusion is in line with previous studies in this field.

CONCLUSIONS

Aim of this paper was to determine the relationship between some internal banking factors such as: profitability indicators, credit risk, liquidity risk, leverage, bank size and the capital adequacy ratio in the Albanian banking system which is used as independent variable. To test the relationship between the variables we use a linear regression analysis.

From the regression results we have come to the following conclusions:

- The profitability indicators such as ROE and ROA have no impact on the capital adequacy ratio in the Albanian banking system.
- The NPL ratio has a negative impact on the capital adequacy ratio meaning that banks with higher credit risk have lower level of capitals.
- The LTD ratio has a negative impact on capital adequacy ratio in the Albanian banking system; this means that banks with higher liquidity risk tend to have lower level of capitals.
- The equity multiplier (EM) has a negative impact on the capital adequacy ratio meaning that banks with a high leverage have generally lower CAR.
- The bank size measured by its assets has a positive impact on capital adequacy ratio in the Albanian banking system. This means that large sized banks have higher capital adequacy ratios.

It is also to mention that in order to further research are to be considered even other variables that can influence the capital adequacy ratio. These variables can be other internal or banking variables as well as macroeconomic ones in order to have a full understanding of the real factors that influence the capital adequacy ratio in the Albanian banking system.

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