

Determinants of Capital Adequacy Ratio. An Empirical Study on Albanian Banking Sector

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Abstract: Capital adequacy ratio (CAR) represents one of the most important indicators of a bank's guarantee and financial stability. Establishing strict rules for maintaining the minimum level of CAR serves as a guarantee valve for the regulatory authority and for the creditors of the banking institution. Besides the standards that exist for the adequacy of bank capital, this ratio varies from bank to bank according to the objectives set by the banking institution, but without affecting the minimum required by the regulatory authority.

The main purpose of this paper consists in the identification and analysis of the factors that affect bank capital for the entire banking system in Albania, measured through the CAR report. In the study is used quarterly data for the period 2016 - 2022. The panel data is analyzed by using R-Studio software. The selection of variables in the model was carried out with OLS Stepwise Backward.

Seven independent variables DEP, LOA, BS, ROA, LLR, LEV, RNI and dependent variable CAR were identified in the study. The results of the best statistically model show that loan loss reserve ratio and bank size are the factors that affect significantly negatively CAR, with coefficients of -0.42 and -0.12, respectively. The results of statistically significant two-variable models showed that DEP, LOA, LLR and LEV affect significantly negatively CAR, while BS affects it positively. While ROA and RNI variables do not show statistically significant relationships neither in the integral model nor in the two-variable models.

Keywords: Banking Capital, Basel Standards, Bank Size, Regulatory Authority, Risk Weighted Assets.

1. INTRODUCTION

The main function of supervision, which is carried out by the Central Bank for the Albanian banking system, is related to the early identification of risks and their prevention through the establishment of strict regulatory frameworks for banking activity. Faced with a continuous globalization process which deeply affects the banking activity, it is necessary to unify the standards on which this activity will be regulated. Even Albania, affected by this process, continues to adapt the Basel standards for the Albanian banking system, with the primary objective of preserving the health of banking institutions and reducing the level of exposure to risk.

Banks are the most important financial intermediary in the world and its regulatory aspects are quite delicate, especially those related to capital regulatory. According to (Santos, 2001), this central and important role is attributed to the elite position that banks have had and continue to have within the financial system, international efforts to unify the standards of bank capital and the importance that capital plays for the financial health of banks.

In the Albanian reality, this role is even more important, since the banking system occupies about 91% of the total assets of the financial system (Financial Stability Report 6M-II, 2022). As a result, the banking sector is considered the backbone of the economy. The shock of this sector would bring direct consequences in the entire financial system and further in the economic one. Due to the fact that the financial system in Albania is "monopolized" by the banking sector, attention to it increases because it is the most important "feeder" of the Albanian economy.

After experiencing banking crises and after the lessons learned from these experiences, the authorities and central banks everywhere in the world initiated the reformation of the rules of banking activity. Basel III standards put the global banking system into a new era, with a more rigorous and strict dimension of rules, with a higher awareness of risks and a higher vigilance before problems become serious. A very important dimension of the Basel Agreement is related to the determination of capital standards, which constitutes one of the biggest banking challenges at the international level. Capital for a bank is very important as it serves as the best guarantee for creditors by amortizing the losses that come from the activity, maintaining the bank's health and not straining it in the face of problems that may come from exposure to various risks.

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Regardless of the benefit that maintaining capital offers, each bank seeks to maximize its profit by trying to increase banking activity towards more profitable but riskier alternatives. For this reason, in order to ensure an adequate level of guarantee for the savings mobilized in the hands of the banks, restrictions have been set regarding the bank capital.

Besides the standards that exist for the adequacy of bank capital, this ratio varies from bank to bank according to the objectives set by the banking institution. In this way, there are a group of factors that influence this decision-making, part of which are related to the banks themselves, from the external environment and part to the decisions of the bank shareholders themselves.

For this reason, the main purpose of this paper is to identify and analyze the factors that determine bank capital for the entire banking system in Albania, which is measured through the Capital Adequacy Ratio (CAR). The study will add value to the knowledge extracted from the existing literature by making relevant analyses. In accordance with the general objective, the paper seeks to achieve the following specific objectives:

- To identify bank-specific variables/factors that affect the capital adequacy ratio. This process is carried out by relying on the accompanying literature;
- To analyze the descriptive elements of the variables identified in the study;
- To examine the nature of the relationship between the bank-specific independent variables and the dependent variable of the capital adequacy ratio;
- To build the most comprehensive and statistically better model for analyzing the CAR indicator and to analyze the factors that influence it significantly;
- To analyze the strength and direction of the relationship that the independent variables have individually with the CAR indicator by building statistically significant simple models with two variables.

2. LITERATURE REVIEW

Numerous studies have been carried out about the Capital Adequacy ratio indicator, its importance and the factors that influence it. The greatest attention has been added especially after the banking crisis of 2008, where the capital element of Basel II initiated the reformation towards new stricter measures towards BASEL III to prevent new crises in the future.

The requirements of the regulatory authority to maintain a minimum level of the capital adequacy ratio serves as a guarantee for financial stability and maintaining the level of efficiency of banking activity. This capital serves to absorb possible losses in the future by offering a guarantee for creditors' money in order to preserve trust in banking institutions and minimize the phenomenon of the spread of bank panic.

(Altunbas, Carbo, Gardener, & Molyneux, 2007) studied the relationship between bank capital and risk for European banks. Their findings showed a positive relationship between risk and bank capital. Their conclusions showed that banks in Europe maintain high levels of capital above the minimum required to prevent risk and their investments were directed to assets with low levels of risk.

(Gunawardhana & Damayanthi, 2020) examined the factors influencing CAR for the ten largest commercial banks in Sri Lanka during the period from 2010 to 2019. The regression results showed that Equity Ratio (EqR), Return on Assets (ROA), Return on Equity (ROE) and Risk Asset Ratio (RAR) are the factors that significantly influence CAR. While bank size (BS), Loan to Asset Ratio (LAR), Deposit Asset Ratio (DAR) did not show significant impact on CAR.

(Sudiyatno, Puspitasarib, Susilowati, Sudars, & Udin, 2019) studied the determinants of CAR for conventional banks in Indonesia during the period 2014-2017. The results show that capital has significant positive relationship with CAR. While bank size and loan to deposit ratio have a negative significant effect on CAR.

(Hafez, 2018) conducted a study on the relationship between Efficiency and Capital Adequacy Ratio in Egypt for the period before and after the crisis. The findings showed that Size had a positive impact on CAR both before and after the crisis, ROA had a positive impact before the crisis but not after it, and Loan to Deposit Ratio showed no effect on CAR.

(Masood & Ansari, 2016) in their study of the banking system in Pakistan found that (ROA), (ROE), non performing loan (NPL) and Bank Size have no effect on CAR. While equity asset ratio (EAR), loan loss reserves (LLR), deposit asset ratio (DAR) had a positive effect on CAR, loan to asset ratio (LAT) had a negative effect on CAR.

(Aktas, Acikalin, Bakin, & Celik, 2015) in their study they identified factors on bank's capital adequacy ratio in South Eastern European (SEE) region. Annual data from 71 commercial banks of 10 SEE region countries were used. The study period is 2007 - 2012. The results in the study show that ROA, leverage, bank size, liquidity, risk and net interest margin have a statistically significant impact on CAR.

(Shingjergii & Hyseni, 2015) in their study during the period 2007-2014 in Albania, they found that size, loans to deposit ratio LTD, nonperforming loans NPL and equity multiplier EM have a significant negative relationship on CAR. While ROA and ROE are not related to CAR.

In the study conducted by (Bateni, Vakilifard, & Asghari, 2014), the relationship of seven independent factors and CAR was analyzed for Iran's private banking market. During 2006-2012 the results showed a negative relationship between size and CAR, positive relationship between Loan to Asset Ratio, ROA, ROE and CAR, while the last variable Deposit to Asset Ratio had no impact on Capital Adequacy Ratio.

(Dreca, 2013) studied the determinants of CAR for 10 banks in Bosnia. The results of the study show that loan loss reserve LLR, ROE, Net Interest Margin NIM and leverage have a positive effect on CAR, while bank size, deposits to

asset DEP, loan to asset LOA and ROA have a negative effect on Capital Adequacy Ratio.

The study carried out for the determination of the influencing factors on the capital adequacy ratio (Buyuksalvarcı & Abdioglu, November 2011) analyzed 24 banks of the Turkish banking sector during the period 2006-2012. Nine independent variables were treated for the dependent variable CAR. Of these, LLR (loan loss reserves) and ROA have a positive relationship with CAR. The variables ROE, Leverage and Loans have a negative relationship with CAR. Other variables such as Bank Size, Deposits, Net Interest Margin and Liquidity were insignificant.

In their study (Ahmad, Ariff, & Skully, 2008) analyzed the determining factors of the capital level of banks in Asian developing economy. The findings showed that bank liquidity, risk and leverage had a positive effect on bank capital. While the size of the banks had a negative impact on capital and net income margin was insignificant.

(Asarkaya & Ozcan, 2007) analyzes the determinants of capital structure in the Turkish banking sector during 2002-2006. The findings showed that deposits to asset ratio was negatively correlated with CAR, while ROE, economic growth, portfolio risk, lagged capital and average capital level were positively correlated with CAR.

3. DATA AND METHODOLOGY

The study includes all the banks of the Albanian banking system during the period 2016- 2022. The number of banks was 16 in 2016, shrinking to 11 banks in 2022. The data used are all official secondary data collected from the annual reports of each commercial bank, Bank of Albania and the Albanian Association of Banks. In the study is used quarterly data in order to have a more representative time series.

The methodology used in this study was panel data regression analysis. The panel data is analyzed by using R-Studio software. The models are estimated with OLS where the standard deviations are robust. The selection of variables in the model was carried out with Stepwise Backward OLS. To analyze the validity, Breusch-Pagan was used for heteroscedasticity, Breusch-Godfrey for autocorrelation and Jarque-Bera for normal distribution.

The research design in this study was of the causal-comparative type, because it is required to analyze the relationship between a dependent variable and a certain number of independent variables by analyzing the cause of each relationship. The purpose of this paper was to investigate the factors influencing the capital adequacy ratio for the Albanian banking system. Based on the literature review, a set of theoretically and empirically proven independent factors that can explain Capital Adequacy Ratio have been selected.

The panel data regression model with the regression equation:

$$CAR_{i,t} = \beta_0 + \beta_1 * DEP_{i,t} + \beta_2 * LOA_{i,t} + \beta_3 * BS_{i,t} + \beta_4 * ROA_{i,t} + \beta_5 * LLR_{i,t} + \beta_6 * LEV_{i,t} + \beta_7 * RNI_{i,t} + \epsilon_{i,t}$$

Where: β_0 is constant; β is coefficient of variables; $\epsilon_{i,t}$ is statistical error

$CAR_{i,t}$ = Capital adequacy ratio i in year t ; $DEP_{i,t}$ = Deposit ratio; $LOA_{i,t}$ = Loan ratio; $BS_{i,t}$ = Bank size; $ROA_{i,t}$ = Return on assets; $LLR_{i,t}$ = Loan loss reserve; $LEV_{i,t}$ = Leverage; $RNI_{i,t}$ = Net interest ratio;

3.1. Theoretical Framework and Hypothesis Development

Table 1 presents the research variables measurements of the study:

Table 1. Research Variables Measurements.

Variable	Symbol	Measurements
Dependent variables		
Capital adequacy ratio	CAR	Capital/ Risk-Weighted Assets
Independent Variables		
Deposits to assets ratio	DEP	Total Deposits/Total Assets
Loans to assets ratio	LOA	Bank Loans / Total Assets
Bank Size	BS	Natural Logarithm of Total Assets
Return on assets	ROA	Net income/ Total Assets
Loan loss reserve	LLR	Loan loss reserves/ Total Loans
Leverage	LEV	Total Liabilities / Total Equity
Net interest income ratio	RNI	Net interest income/Total Assets

Source: Author's illustration.

Based on the selection of variables based on the literature review, the following hypotheses were formulated:

- H1:** DEP significantly effect on CAR.
- H2:** LOA significantly effect on CAR.
- H3:** BS significantly effect on CAR.
- H4:** ROA significantly effect on CAR.
- H5:** LLR significantly effect on CAR.
- H6:** LEV significantly effect on CAR.
- H7:** RNI significantly effect on CAR.

According to Bank for International Settlement (BIS) CAR is determined by of 8%. However, the Central Bank of Albania sets the level of this ratio at 12%.

Currently in Albania, banks operate according to regulation, no. 41, dated 5.6.2019, "On macroprudential capital additions, which are subject to the capital conservation addition, the addition for systemically important banks, the countercyclical capital addition, and the addition for systemic risk. (Financial Stability Report 6M-II, 2022).

The performance of CAR in annual terms for the banking system in Albania is presented in Fig. (1):

It is evident that throughout the entire period under study, the CAR level is above the 12% level required by the regulatory authority. At the end of 2022, the CAR indicator was at 18.1%, where the most important contribution within the system was made by banks with European capital and non-

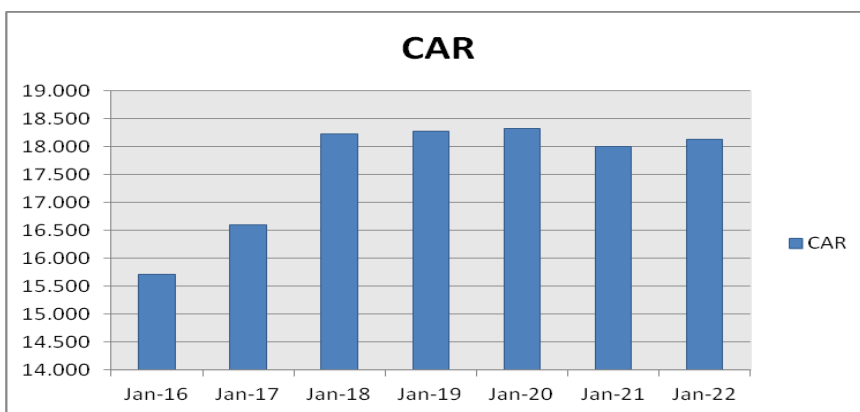


Fig. (1). Capital Adequacy Ratio.

Source: Albanian Association of Banks

Table 2. Variables descriptive statistics.

Variable	Mean	Median	SD	Kurtosis	Skewness	Range	Minimum	Maximum
CAR	0.1765	0.1805	0.0112	-0.9699	-0.6245	0.0366	0.1560	0.1926
DEP	0.8114	0.8086	0.0081	2.0961	1.4579	0.0358	0.7999	0.8357
LOA	0.4020	0.3947	0.0221	-0.6630	0.7659	0.0767	0.3727	0.4494
BS	6.1833	6.1644	0.0447	-0.5835	0.7590	0.1505	6.1230	6.2735
ROA	0.0120	0.0130	0.0037	-0.6984	-0.6727	0.0122	0.0043	0.0165
LLR	0.0762	0.0684	0.0351	-1.0310	0.5548	0.1083	0.0328	0.1410
LEV	8.6986	8.6693	0.2575	0.2604	0.7068	1.0749	8.2917	9.3666
RNI	0.0181	0.0181	0.0082	-1.2605	0.0390	0.0250	0.0067	0.0317

Source: Author's calculator (Albanian Association of Banks data).

systemic banks. In inter-annual terms, the rate of growth compared to the previous year is 0.72%. The highest values are evident throughout the years 2018, 2019 and 2020 with the corresponding values of 18, 235%, 18.28% and 18.32%.

Throughout 2022, the CAR indicator has increased during the first half of the year and decreased during the second half. The decrease in regulatory capital was higher than the decrease in risk-weighted assets. This came as a result of the decline in paid-in capital in foreign currency as a result of structural changes in the banking sector and the effect of the exchange rate. While the positive contribution of retained earnings in the regulatory capital has been decreasing from year to year. (Financial Stability Report 6M-II, 2022).

4. EMPIRICAL ANALYSIS

4.1. Descriptive Statistics

Table 2 analyzes the descriptive data of the variables in the study. The maximum value of CAR is 0.1926 while the minimum is 0.1560, with a median of 0.1765. This shows that the banks in Albania are well capitalized maintaining the CAR indicator above the minimum level required by the regulatory authority of 12%, showing a fairly good level of compliance with these rules. All banks in Albania maintain a satisfactory CAR level since the mean level of this indicator

is not far from the maximum and minimum level, which is also reflected in the value of the standard deviation of 0.0112.

It is also noted that the ROA profitability indicator is at a maximum level of 0.0165 and a minimum of 0.0043, at satisfactory levels. We see that the standard deviation is 0.0037, the lowest of all other variables, showing that the variation of profitability between banks in the Albanian banking system is quite small. The same can be said for the indicator of deposits, which are dominant in the external sources of financing for banks in Albania with a maximum level of 83.57% and a minimum of 79.99%. The low standard deviation of 0.0081 again indicates a low variation in the distribution of deposits between banks.

If we look at the skewness values for the variables, it is identified that CAR and ROA have negative but not very high skewness values < -1. RNI, BS, LLR and LEV have positive values < 1 indicating that the data have a good normal distribution as their values are between -1 and +1, except DEP which has 1.4579. The same is seen for the kurtosis values which are between -2 and +2, except for DEP which is slightly higher at 2.0961.

Table 3 presents the correlation matrix between the variables.

Table 3. Pearson's Correlation Matrix.

	CAR	DEP	LOA	BS	ROA	LLR	LEV	RNI
CAR	1							
DEP	-0.7404	1						
LOA	-0.88148	0.734623	1					
BS	0.639306	-0.44694	-0.77587	1				
ROA	0.073937	-0.4988	-0.17161	-0.05124	1			
LLR	-0.89976	0.689485	0.957486	-0.85388	-0.09266	1		
LEV	-0.60864	0.761937	0.518393	-0.07403	-0.42456	0.461946	1	
RNI	-0.03619	-0.03251	-0.03094	0.054685	0.159621	0.003519	0.105476	1

Source: Author's calculator (Albanian Association of Banks and Bank of Albania data).

According to the results, we see that the CAR indicator has the strongest negative relationship with LOA, DEP and LLR and positively with BS. While the relationship with ROA and RNI appears very weak. We will see similar results below in the construction of statistically significant econometric models with two variables. An increase in loans, deposits and loan loss reserve is accompanied by a decrease in the capital adequacy ratio. While the increase in the size of banks measured as the logarithm of total assets is associated with an increase in CAR.

4.2. Results

The results of the integral model with all the selected variables are estimated by OLS where the standard deviations are robust. The findings of the model are presented in Table 4:

Table 4. Results of the Integral Model.

MODEL FIT:				
$F(7,20) = 25.28, p = 0.00$				
$R^2 = 0.90$				
$Adj. R^2 = 0.86$				
Standard errors: Robust, type = HCl				
	Est.	S.E.	t val.	p
(Intercept)	1.11	0.36	3.12	0.01
DEP	-0.34	0.22	-1.54	0.14
LOA	0.02	0.13	0.15	0.88
BS	-0.10	0.05	-1.88	0.05
ROA	-0.55	0.17	-3.21	0.00
LLR	-0.35	0.09	-4.01	0.00
LEV	-0.00	0.00	-0.37	0.72
RNI	0.02	0.10	0.23	0.82

Source: Author's calculation.

According to the results, the integral model has an Adjusted R-squared of 0.86, so it has a good prediction of the dependent variable CAR from the independent variables. From the findings of the model, we see that the independent variables BS, ROA and LLR have a statistically significant influence on the dependent variable CAR, having a probability of $p < 0.05$. While other variables are not statistically significant.

Increasing the size of the bank by 1 unit affects the decrease of CAR by 0.1 unit. The relationship is significant negative as suggested by other findings in the literature. As for ROA, its increase by 1 unit affects the decrease by 0.55 units of CAR. And finally, if the variable LLR increases by 1 unit, it significantly affects the CAR with a decrease of 0.35 units.

For the variables that are not statistically significant, we can interpret the direction of the influence of the RNI variable, since the other variables will be explained below. The increase in the net income margin reflects an increase in profitability, providing opportunities for the bank to increase its capital through retained earnings. So the relationship appears positive between RNI and CAR. Such relationship have also been found in the works of (Iloska, 2014), (Thoa & Anh, 2017).

Since the integral model does not represent the purest model in terms of heteroskedasticity and autocorrelation, it was requested to build a model that would fulfill all statistical criteria..

After using the technique for selecting the best and cleanest model, the result is presented in table 5. The selection of variables in the model was done with OLS Stepwise Backward.

The results show that the coefficient of determination is 86 % with a significance level of 0.000, being a good representative for the capital adequacy ratio.

From the raised hypotheses, only hypotheses 3 and 5 are fulfilled, since only the variables LLR and BS appear statistically significant for CAR.

More specifically, the model represented is:

$$CAR = 0.95 - 0.42*LLR - 0.12*BS + \varepsilon_{it}$$

Table 5. The Best and Significant Model.

Standard errors: Robust, type = HC1				
	Est.	S.E.	t val.	p
(Intercept)	0.95	0.22	4.36	0.00
LLR	-0.42	0.04	-9.46	0.00
BS	-0.12	0.03	-3.45	0.00
F(2,25) = 84.39, p = 0.00				
R ² = 0.87		Adj. R ² = 0.86		
Breusch-Pagan		BP = 10.624, df = 7, p-value = 0.1559		
Breusch-Godfrey		LM test = 0.81387, df = 1, p-value = 0.367		
Jarque Bera		X-squared = 0.36837, df = 2, p-value = 0.8318		

Source: Author's calculation.

Loan loss reserve represents a very important element of the supervision rules that the supervisory authority exercises so that the loan portfolio for each bank maintains the adequate level of reserves against losses against the level of risk. Loan loss reserves represent money set aside for potential losses that may be experienced from loan defaults to amortize potential future losses. The higher the risk of the credit classes, the higher these reserves. The reserve account is reduced again when the loans are returned to the bank. The results of the model shows a statistically significant relationship between LLR and CAR with a coefficient of -0.42. For the Albanian banking system, an increase of 1 unit in the LLR indicator is accompanied by a decrease of 0.42 units in the capital adequacy ratio. The negative impact of loan loss reserve on capital is explained by the fact that Albanian banks, when faced with an increase in loans with a high degree of risk, and consequently with an increase in reserves, are accompanied by a slower increase in capital.

So the growth of risk-weighted assets is faster than the growth of capital, reflecting in a lower CAR. When banks are in trouble, they will be slower to adjust their bank capital. According to the literature review, similar studies have concluded a negative relationship between loan loss reserve and capital adequacy ratio

(Thoa & Anh, 2017), (Dreca, 2013), (Blöse, 2001), (Choi, 2000), (Hassan, 1992).

The size of banks affects negatively the capital adequacy ratio. An increase of one unit in the size of banks decreases the CAR indicator by 0.12 units. Bank size represents the number of assets owned by a bank. The higher the number of assets, the bigger the bank and vice versa.

The main reason is related to the security offered by large banks against risk. The bigger a bank is, the more power and capital it has to face every possible risk faced by the banking activity, thus reducing the capital held. While small banks have higher risk and consequently capital requirements increase. Also, large banks give a higher signal of the possibility of diversifying assets, resulting in a decrease in the level of risk. The results derived from the model correspond to

most of the findings from the literature review in similar works where the relationship between the size of banks and the CAR indicator is statistically significant negative (Aktas, 2015), (Gropp & Heider, 2009), (Reynolds, Ratanakomut, & Gander, 2000), (Yu, 1996), (Shrieves & Dahl, 1992).

To analyze the strength and direction of the relationship that the specific variables have individually with the CAR indicator, table 6 presents the statistically significant simple models with two variables:

Model 1 is presented with a $p < 0.001$, coefficient -1.03 between the DEP and CAR deposit ratio, with a standard deviation of 0.18. A one-unit increase in DEP is associated with a 1.03-unit decrease in CAR. Banks in Albania with the increase in the level of deposits to total assets are accompanied by a decrease in the level of CAR. This shows a prudent way of using the funds provided by their creditors by investing in assets with a moderate level of risk, providing a guarantee for the banking activity, which is therefore associated with a level of capital that grows more slowly than the assets of risk weighted. Similar results were found in the works of (Buyuksalvarcı & Abdioglu, November 2011), (Asarkaya & Ozcan, 2007).

Model 2 is presented with a $p < 0.001$, coefficient -0.45 between loan ratio LOA and CAR, with a standard deviation 0.05. A one-unit increase in LOA is associated with a 0.45-unit decrease in CAR.

The increase in loans is accompanied by an increase in the probability of bad loans, which in case of default will absorb bank capital, reducing it. The higher the LOA indicator, the less funds the bank has available to meet its short-term obligations, shrinking liquidity and increasing risk. This happens for the Albanian banking system, showing a negative relationship between the two indicators. Similar results were found in the works of the authors (Thoa & Anh, 2017), (Aspal & Nazneen, 2014), (Bateni, Vakilifard, & Asghari, 2014), (Dreca, 2013), (Büyüksalvarcı & Abdioglu, 2011).

Model 3 is presented with a $p < 0.01$, coefficient 0.16 between bank size and CAR, with a standard deviation 0.04. So a one-unit increase in BS is associated with an increase of

Table 6. Individual Models with Two Variables, Statistically Significant.

	Model 1	Model 2	Model 3	Model 4	Model 5
(Intercept)	1.01 *** (0.15)	0.36 *** (0.02)	-0.82 ** (0.23)	0.20 *** (0.00)	0.41 *** (0.06)
DEP	-1.03 *** (0.18)				
LOA		-0.45 *** (0.05)			
BS			0.16 ***(0.04)		
LLR				-0.29 ***(0.03)	
LEV					-0.03 ***(0.01)
N	28 0.55	28 0.78	28 0.41	28 0.81	28 0.37

Source: Author's calculation.

0.16 units in CAR. In contrast to the full model results above, the relationship in the 2-variable model between BS and CR is positive. So in the case where the analysis is done independently of the other variables, it is concluded that the larger the banks are, the higher the level of their capital reserves, seeking to be as safe as possible for creditors, maintaining a high level of evaluation by the supervisor. Similar results were found in the work of (Buyuksalvarcı & Abdioglu, November 2011).

Model 4 is presented with a $p < 0.001$, coefficient -0.29 between Loan loss reserve LLR and CAR and standard deviation 0.03. So a one-unit increase in LLR is associated with a decrease of 0.29 units in CAR. The results in the two-variable model are similar to the integral model above.

Model 5 is presented with a $p < 0.001$, coefficient -0.03 between Leverage and CAR, with a standard deviation 0.01. So a one-unit increase in LEV is associated with a 0.03-unit decrease in CAR. Banks that have a high level of the ratio of liabilities to capital, shows that the growth of this ratio leads to a higher growth of liabilities than capital and therefore the bank has more difficulties in generating capital by reducing the CAR. The imposition of restrictions on the CAR ratio, which would cause it to increase, would contribute to the reduction of the LEV. So more capital for a given level of banking activity.

5. CONCLUSIONS

Capital adequacy ratio (CAR) represents one of the most important indicators of a bank's financial stability and guarantee. Establishing strict rules for maintaining the minimum level of CAR serves as a guarantee valve for the regulatory authority and for the creditors of the banking institution.

Through this study, it was possible to identify the determinant factors in the capital adequacy ratio for all operational banks in the Albanian banking system during the period 2016-2022. After reviewing the results derived from the empirical models through the literature, were identified seven independent variables: DEP, LOA, BS, ROA, LLR, LEV,

and RNI. While the dependent variable CAR. The panel data is analyzed by using R-Studio software. The selection of variables in the model was carried out with OLS Stepwise Backward.

The maximum value of CAR is 0.1926 while the minimum is 0.1560, with a median of 0.1765. This shows that the banks in Albania are well capitalized maintaining the CAR indicator above the minimum level required by the regulatory authority of 12%, showing a fairly good level of compliance with these rules.

The results of the statistically best model show that the factors that significantly influence CAR are loan loss reserve ratio and bank size. Both factors have a negative effect with coefficients of -0.42 and -0.12, respectively. The negative impact of loan loss reserve on capital is explained by the fact that Albanian banks, when faced with an increase in loans with a high degree of risk, and consequently with an increase in reserves, are accompanied by a slower increase in capital. So the growth of risk-weighted assets is faster than the growth of capital, reflecting in a lower CAR.

The negative effect of bank size on CAR is related to the security offered by large banks against risk. The bigger a bank is, the more power and capital it has to face any possible risk that banking activity faces by reducing the capital held. Also, large banks give a higher signal of the possibility of diversifying assets, resulting in a decrease in the level of risk.

The results of statistically significant models with two variables showed that between the ratio of DEP deposits and CAR the relationship is negative with a coefficient of -1.03. This shows a careful way of using the funds secured by their creditors by investing in assets with a risk level which is not associated with capital growth. A significant negative relationship with a coefficient of -0.45 was found between the loan ratio LOA and CAR. The higher the LOA indicator, the less funds the bank has available to meet its short-term obligations, shrinking liquidity and increasing risk.

In the case where the model contains two variables, the results show that the relationship between bank size and CAR is positive with a coefficient of 0.16. So, the bigger the banks, the higher the level of their capital reserves, seeking to be as safe as possible for creditors and maintaining a high level of assessment by the regulatory authority. The relationship between Loan loss reserve LLR and CAR is the same as the integral model with a coefficient of -0.29. While the relationship between Leverage and CAR is negative with a coefficient of -0.03. While ROA and RNI variables do not show statistically significant relationships neither in the integral model nor in the two-variable models.

LIMITATIONS AND SUGGESTIONS:

After the results of this study, it is suggested to include more independent variables in future studies of this field. Mainly, the suggested variables refer to the external macroeconomic environment in which the banking activity is carried out and elements of risk that would affect the capital adequacy ratio. In this research paper, only specific internal factors related to banking activity indicators were used. Also, another suggestion is related to the time extension of the data to be used in the study.

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