

ISRG Journal of Economics, Business & Management (ISRGJEBM)



ISRG PUBLISHERS

Abbreviated Key Title: Isg J Econ Bus Manag

ISSN: 2584-0916 (Online)

Journal homepage: <https://isrgpublishers.com/isrgjebm/>

Volume – II Issue - III (May – June) 2024

Frequency: Bimonthly



ANALYZING THE INFLUENCE OF BANK LOANS AND CAPITAL ADEQUACY RATIO ON ALBANIAN BANKS' PROFITABILITY

Olsi Xhoxhi^{1*}, Emi Malaj²

^{1,2}Faculty of Economy, Department of Economics, University "Ismael Qemali", Vlorë, Albania

| **Received:** 28.04.2024 | **Accepted:** 02.05.2024 | **Published:** 5.05.2024

*Corresponding author: Olsi Xhoxhi

Faculty of Economy, Department of Economics, University "Ismael Qemali", Vlorë, Albania

Abstract

The material involved in this study is secondary data from the annual reports of seven banks between the periods 2017-2022. This paper targeted the relationship of Return on Assets, Bank Loan, and Capital Adequacy Ratio using Multiple Linear Regression. Descriptive statistics of this study showed an average of 0.73 as the return on assets, with a high variability of bank loans (mean: 40.97) compared to the average CAR of 17.78. The correlation study shows a very low negative correlation between Bank Loans and CAR: $r = -0.46$. It indicates that as a bank loans increase, the Capital Adequacy Ratio decreases. Regression analysis on the matter shows a model with a power of explanation of 0.5 and statistically significant coefficients for Bank Loan (-0.0683) and CAR (-0.1677). In summary, an increase in Bank Loan and CAR are associated with a decrease in ROA. In addition, 25 percent of the ROA values were below 0.31. This indicates that a large portion of banks experience a decline in return. The quartile analysis of Bank Loan and CAR also shows that 25 percent of Bank Loan values are below 30.90, while 25 percent of CAR values are below 15.40, indicating the spread of such variables in the sample. All of these together show the value of the effective control of bank loans and the maintenance of adequate capital reserves in order to achieve, among other things, the optimization of the Return on Assets and ensuring financial stability.

Key Words: Capital Adequacy Ratio, Bank Loan, Multiple Linear Regression, Return on Assets.

1. INTRODUCTION

The bank sector is the backbone of the economy by providing the services that facilitate lending and borrowing. In this complex ecosystem, the capital adequacy ratio is a measure used to give an indication of the financial resilience of a bank because it shows the ability of a bank to absorb losses. A bank with a high capital

adequacy ratio is able to weather any economic downturn and any unforeseen risks safely, without putting depositors' money at risk and without any loss of confidence in the financial system. Besides, loans are one of the most significant components of bank assets and affect the bank's ratios such as the Return on Assets.

Therefore, proper loan management in terms of proper risk assessment and diversification helps in the management of ROA since these loans affect the interest income from loans, as well as the potential for loan defaults. Therefore, balancing the capital adequacy and lending activities is of paramount importance if a bank is to achieve stable profitability in the banking sector.

2. LITERATURE REVIEW

The paper of Koroleva et al. (2021) looks at the relation of internal and external factors to the profitability of state-owned commercial banks. The pooled regression, fixed effect, and random effect models work with the top five Chinese state-owned commercial banks from 2007 to 2019. The study reveals internal factors size, credit quality, and liquidity effectively influence profitability. More significant or larger state-owned banks, higher credit quality, and better liquidity tend to show more profitability. The influence of external factors it is represented by the natural logarithm of GDP show a negative relation with the profitability: the lower level of GDP, the higher level of profitability for state-owned commercial banks in China. This study provides a useful perspective on the dynamics of profitability for state-owned commercial banks in the context of an evolving Chinese banking sector.

The research of Lestaria et al. (2021) studies how liquidity, leverage, and bank size affect the profitability of the conventional banking sector and how they contribute to economic cycles in the country. The research was conducted between 2010 and 2019, with 29 conventional banks listed in the Indonesia Stock Exchange, totaling 290 observations. In measuring profitability, return on assets (ROA), return on equity (ROE), and net interest margin (NIM) were considered. Liquidity was measured by loan to deposit ratio (LDTR), equity to asset ratio (ETAR), and the natural log of total assets (LNTA). The results indicate that liquidity had an insignificant negative effect on the ROA and ROE but an insignificant and positive effect on NIM. Leverage had a negative but insignificant effect on both ROA and NIM but significantly negatively influenced ROE. In contrast, the bank size had a positive and significant effect on ROA, an insignificant negative effect on ROE, and a significantly negative effect on NIM. Insights from the research will help in guiding the internal management of the Indonesian conventional banking sector in formulating policies and decisions aimed at increasing profitability.

Anto et al. (2021) study focused on the impact of Bank Age, Loan to Assets Ratio (LAR), Net Interest Margin (NIM), and non-interest margin (Non NIM) on bank efficiency, especially in ASEAN-5 countries, namely Indonesia, Singapore, Thailand, Malaysia, and the Philippines. Bank size was a control variable in this study. The sample of the research was banking general institutions registered in the country during the years 2014 to 2018, whereby 58 banks were included through purposive sampling. In this study, the two-stage methodology used DEA in computing the bank efficiency and in multiple regression analysis. The result showed that capitalization and bank age negatively influenced the bank efficiency while Loan to Assets Ratio (LAR), Net Interest Margin (NIM), and Non-NIM positively influenced bank efficiency. One of the most exciting findings of this study was the application of DEA in assessing bank efficiency in the ASEAN-5 region.

The research of Aladwan (2015) seeks to explore how the size of banks impacts their profitability amongst Jordanian listed commercial banks in several categories of size. The data range of

the period 2007-2012 were used in categorizing banks by their relative size from the Total Assets. The dependent variable was the measure of profitability as indicated by Return on Equity. The research aims to establish whether profitability differs based on the size of banks or if there is any statistical difference between them. I would use simple regression analysis to approximate asset size through dummy variables for the categories. The results indicate that banks of different sizes have a very significant range of profitability.

Almazari's (2014) study focused on internal factors affecting profitability of banks, to understand which Saudi and Jordanian banks differ using these factors. Data was collected using secondary sources, with 23 banks under both countries including 161 observations from the period 2005-2011. Financial ratio calculations, statistical methods such as Pearson's correlation, and descriptive analysis of variance, and regression analysis were performed to test hypotheses and which provide differences amongst banks. The empirical study of the factors impacting profitability will reveal significant positive correlations between variables such as TEA, TIA, and LQR variables with Saudi banks, whereas the negative correlation was found to be with variables such as NCA, CDR, CIR, and SZE variables. On the other hand, Jordanian banks showed positive correlations with LQR, NCA, TEA, and CDR variables, but negative correlations were obtained with variables such as CIR, TIA, and SZE. Thus, this study states further empirical research is necessary to find the rest of the internal factors associated with bank profitability.

Ali et al. (2018) research intended to examine the degree of the impact of macroeconomics on the profitability of Islamic banks in Brunei, taking the Bank Islam Brunei Darussalam from 2012 to 2016 and calculating the Return on Assets, as well as Return on Equity for the bank. Other macroeconomic variables considered in the study are GDP growth rate, inflation, interest rate, exchange rate, oil prices, competition, and money supply. Data were obtained from DEPD, AMBD, and IMF reports, worked out by fixed effects panel regression using Stata 15. Out of the results, findings showed that GDP growth rate, inflation, exchange rate, oil prices, and money supply positively impact the profitability rate, with oil price, GDP, and inflation rates being the most significant, while the least significant would be the exchange rate and money supply. The findings call on policymakers to find new strategies for economic and financial rehabilitation and find an adaptation of marketing strategies to mitigate the impacts of macroeconomics. This research adds a lot to the literature on the profitability of Islamic banks, especially in Brunei.

Marozva (2015) deals with an empirical study on the relationship between liquidity and bank performance in South Africa over the period 1998 to 2014. The study uses the Autoregressive Distributed Lag (ARDL)-bound testing method in addition to Ordinary Least Squares (OLS) to find the relationship of net interest margin with liquidity. Liquidity, in this discussion, includes market liquidity risk and funding liquidity risk. The study indicates a significant negative determinant relationship between net interest margin and funding liquidity risk. The study, however, indicates an insignificant co-integrating relationship between net interest margin and two measures of liquidity. Based on the findings, Marozva indicates a further need for research on liquidity in relation to asset-liability mismatch. Further, the paper indicates liquidity as a transient phenomenon requiring acute short-term analysis.

Menicucci and Paolucci (2016) tried to develop an empirical study of whether bank-specific features of profitability in the European banking sector were internally driven and how such predictors are affecting the level of high profitability. He performed regression analysis on 35 top European banks for the years 2009-2013. In the process, he found that several internal features significantly affect the level of profitability across different profitability measures though varying by type. More specifically, a larger capital ratio tends to augment profitability levels while loan loss provisions tend to reduce them. Also, the level of deposits and loans ratios was seen to be profitability enhancing though not in the same consistent manner. These resultant insights have a strong policy implication in further enhancing the efficiency and competitiveness of the European banking sector and is strongly advised to regulatory authorities to build stability within the sector. It fills a gap in the literature as it is one of the few studies that empirically investigated European bank profitability, an area that has not received as much attention compared to studies in other developed countries.

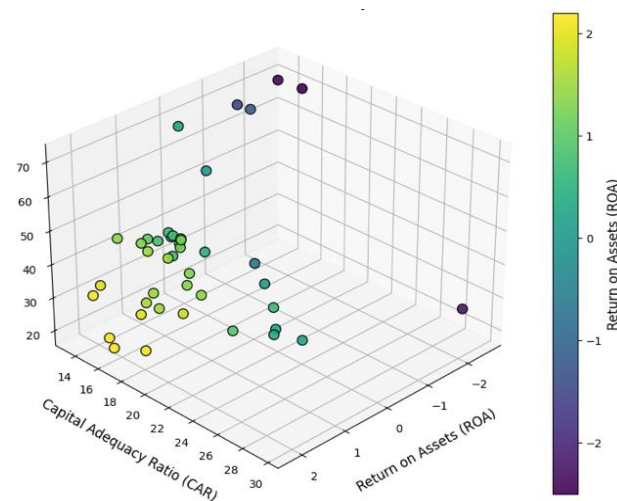
3. DATA AND METHODOLOGY

This research depends on secondary data trailed from the annual reports of different banks, such as: Union Bank, Intesasanpaolo Bank, Tirana Bank, ProCredit, Banka Kombetare Tregtare, Raiffeisen Bank, and Fibank. This entails data of six years, from the year 2017 to 2022, consisting of 42 data points. The major tool for data analysis and visualization in this research is Python coding. The econometric approach that was used for analysis in this study was Multiple Linear Regression. The dependent variable is Return on Assets (ROA) while the independent variables are Bank Loan and Capital Adequacy Ratio.

4. RESULTS

In this section we will explore both descriptive and regression analyses with a view to understanding the data comprehensively. Figure 1 presents a visual representation of our data, providing a clear illustration of its patterns and trends.

Fig 1. Data Visualization



The results from Table 1 show that the mean Return on Assets for the sample is 0.73 with a 1.20 standard deviation. Bank Loan has a mean of 40.97, with a 13.72 standard deviation, showing loan amount variability. The Car has a mean of 17.78 with a 3.45 standard deviation, which shows that the range of Car is narrower than the bank loan. The minimum ROA value is -2.50, and the maximum is 2.20. As for bank loan, the minimum is 19.23 and the

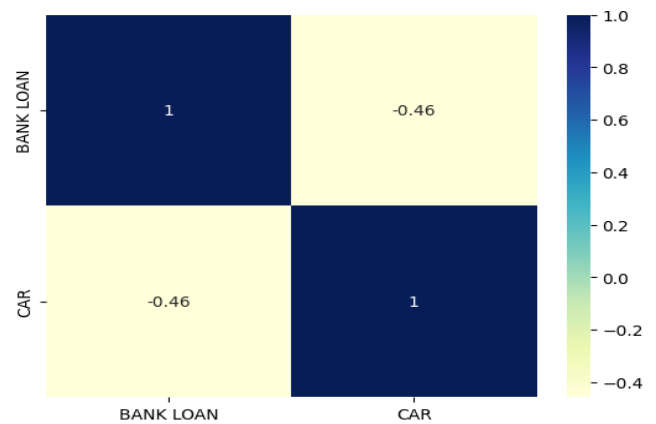
maximum is 71.37, showing loan amount variance. In contrast, the minimum of Car is 13.42 and the maximum is 29.60, showing less variability compared to bank loan. The quartile analysis showed that 25% of the ROA was below 0.31, and 75% was below 1.50. The same is for Bank Loan, with 25% below 30.90 and 75% below 45.95. The same is for Car, with 25% below 15.40 and 75% below 19.14. These statistics give some sense of the distribution and central tendency of the variables.

Table 1. Descriptive Statistics

	ROA	BANK LOAN	CAR
count	42,00	42,00	42,00
mean	0,73	40,97	17,78
std	1,20	13,72	3,45
min	-2,50	19,23	13,42
25%	0,31	30,90	15,40
50%	1,02	39,86	17,22
75%	1,50	45,95	19,14
max	2,20	71,37	29,60

In the Figure 2, the correlation coefficient of approximately -0.46 suggests a moderate negative correlation between Bank Loans and Capital Adequacy Ratio. This implies that as the amount of bank loans increases, the Capital Adequacy Ratio tends to decrease. Conversely, as the Capital Adequacy Ratio increases, there is a tendency for bank loans to decrease.

Fig 2. Correlation Between Features



The output in Table 2 suggests a relatively moderate level of explanatory power for the linear regression model which was estimated using the Ordinary Least Squares, OLS method: R-squared value is 0.5. Hence, about 50% of the dependent variable is explained by the independent variables included in the model. The adjusted R-squared value, which corrects for model complexity, is a bit smaller value—0.474. That is, there is a slight decrease in explanatory power when comparing this adjusted value to the value just above it. A slight decline in the explanatory power is indicated by the F-statistic value of 19.48, with p-value of Prob (F-statistic) = 1.36e-06. Such a strong indication of statistical significance indicates a model showing that the overall model is appropriate. The AIC value of 110.3 and BIC value of 115.5 suggest that the model is good enough relative to other explanations. Lower AIC and BIC values indicate better fit. The negative value of Log-Likelihood, which is equal to -52.164, is a

measure of how well the model predicts the observed data: lower values indicate better fit.

Table 2. Model Results

Model	OLS
R-squared	0,5
Adj. R-squared	0,474
F-statistic	19,48
Prob (F-statistic)	1,36e-06
Log-Likelihood	-52,164
AIC	110,3
BIC	115,5

The regression analysis in Table 3 discloses statistically significant coefficients for both BANK LOAN and CAR variables. The BANK LOAN coefficient value is estimated at -0.0683 and is statistically important at $p = 0.000$. So, for every unit increase in BANK LOAN, the dependent variable reduces by approximately 0.0683 units. On the other hand, CAR has a coefficient value of -0.1677, which is given a statistical significance at $p = 0.001$. So, an increase in one unit of CAR decreases the dependent variable by approximately 0.1677 units. These low p -values indicate strong evidence against the null hypothesis, and thereby these coefficients support the significance of these variables in explaining the variability of the dependent variable.

Table 3. Model Coefficients

	const	BANK LOAN	CAR
coef	6,5128	-0,0683	-0,1677
std err	1,082	0,011	0,044
t	6,021	-6,141	-3,795
P> t	0,000	0,000	0,001
[0.025	4,325	-0,091	-0,257
0.975]	8,701	-0,046	-0,078

In this statistical analysis in Table 4, there are several metrics that support adequacy of the model: the Omnibus test proves for good overall fit, to be noted in the probability value that the residuals are roughly normally distributed. Skewness and kurtosis values are also in accordance with the expectations, as the residuals are symmetric and nearly normal. Still, the Durbin-Watson test states that the residuals exhibit slight autocorrelation, which affects the reliability of the estimates of the model. Despite this concern, the Jarque-Bera test indicates the residuals approximate normal distribution, which suggests that the model's predictions are generally valid.

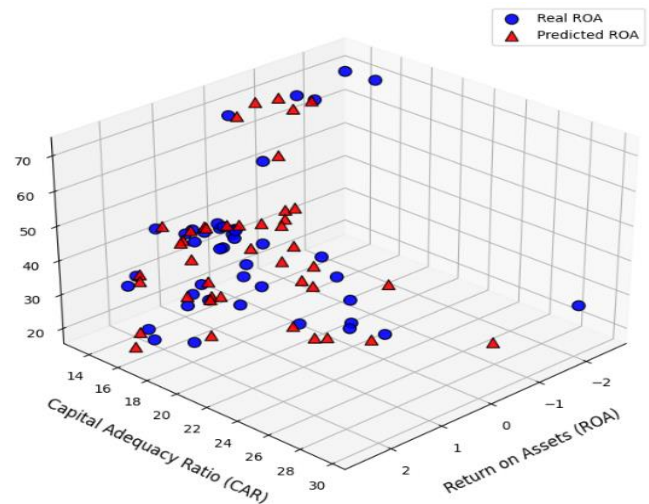
Table 4. Regression Analysis Summary

Omnibus	3.685
Prob(Omnibus)	0.158
Skew	-0.663
Kurtosis	2.988
Durbin-Watson	2.291

Jarque-Bera (JB)	3.081
Prob(JB)	0.214

In the figure below, are displayed the real and predicted Return on Assets (ROA).

Fig 3. Real and Predicted ROA



5. CONCLUSIONS

The study conducted provides a detailed analysis of the variables under study with descriptive statistics, correlation analysis, and regression modeling. Descriptive analysis showed significant variations and tendencies within the dataset. Thus, the central tendencies and distributional characteristics of key variables, including Return on Assets, Bank Loan, and CAR, were analyzed. Furthermore, the relation between variables has been analyzed by way of the correlation analysis, showing meaningful relationships between the variables, especially in the form of a moderate negative relationship between Bank Loans and Capital Adequacy Ratio. The regression analysis has gone further in exposing the factors that lead to the variability of the dependent variable, revealing the importance of both Bank Loan and CAR in explaining the variability in the target variable. In general, the statistical model was adequate and valid, with a sound basis in modeling the complex interactions of forces related to the financial outcomes. These results shall contribute to an improved insight into the dataset, thus proving to be of very useful value for stakeholders in making decisions within the financial sector.

REFERENCES

1. Aladwan, M. S. (2015). The impact of bank size on profitability“an empirical study on listed jordanian commercial banks”. *European Scientific Journal, ESJ*.
2. Ali, Q., Maamor, S., Yaacob, H., & Gill, M. U. (2018). Impact of Macroeconomic Variables on Islamic Banks Profitability. *International Journal of Business Ethics and Governance (IJBEG)*, 20-35.
3. Almazari, A. A. (2014). Impact of Internal Factors on Bank Profitability: Comparative Study between Saudi Arabia and Jordan. *Journal of Applied Finance & Banking*, 1-7.
4. Anto, R., Pangestusti, I. R., & Purwandari, E. N. (2021). Determinants of Bank Efficiency in ASEAN5: Size as a Control Variable. *Universal Journal of Accounting and Finance*, 542-547.

5. Koroleva, E., Jigeer, S., Miao, A., & Skhvediani, A. (2021). Determinants Affecting Profitability of State-Owned Commercial Banks: Case Study of China. *Risks*, 150.
6. Lestaria, H. S., Tarigan, G. G., & Pohan, L. A. (2021). The Effect of Liquidity, Leverage and Bank's Size of the Profitability Conventional Banks Listed on Indonesia Stock Exchange. *Jurnal Manajemen (Edisi Elektronik)*, 188-201.
7. Marozva, G. (2015). Liquidity And Bank Performance. *International Business & Economics Research Journal (IBER)*, 453–562.
8. Menicucci, E., & Paolucci, G. (2016). The determinants of bank profitability: Empirical evidence from European banking sector. *Journal of Financial Reporting and Accounting*, 86-115.